

North Oaks Health Parking Garage
North Oaks Medical Center

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HOSPITAL SERVICE DISTRICT NO. 1 OF TANGIPAHOA PARISH
d.b.a. NORTH OAKS HEALTH

North Oaks Health Parking Garage

Hammond, LA

CONSTRUCTION DOCUMENTS

SPECIFICATIONS

WHLC PROJECT #26-020

WASHER HILL LIPSCOMB CABANISS ARCHITECTURE (LA) L.L.C
1744 OAKDALE DRIVE
BATON ROUGE, LA 70810

SEPTEMBER 9, 2026 **DIVISIONS 1 - 44**

HOSPITAL SERVICE DISTRICT NO. 1 OF TANGIPAHOA PARISH
d/b/a/ NORTH OAKS HEALTH

NORTH OAKS HEALTH PARKING GARAGE

Hammond, Louisiana

WHLC Project No. 26-020

CONSTRUCTION DOCUMENTS PROJECT MANUAL AND SPECIFICATIONS

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DIVISION 00

PROCUREMENT REQUIREMENTS

OFFICIAL ADVERTISEMENT FOR BIDS

PROJECT: **NORTH OAKS HEALTH**
Parking Garage

BID DATE: Sealed bids will be received on
Thursday, October 8, 2026, by 2:00pm

OWNER: Hospital Service District No. 1 of Tangipahoa Parish
North Oaks Health
15790 Paul Vega M.D. Drive
Hammond, LA 70403

PLACE: Bids will be received by WHLC Architecture, for the OWNER in the North Oaks Outpatient Diagnostic Center, Auditorium, at 15837 Paul Vega MD Drive, Hammond, LA 70403 and will be opened and read aloud.

Bidders shall submit bids electronically in accordance with Louisiana Revised Statute 38:2212 E(1). Bid related information is also available online and electronic bids must be submitted online at www.centralbidding.com. Please call 225-810-4814 for all questions regarding the online bid process. The electronic bid must be accompanied by a scanned copy of the bid security being furnished (either Bid Bond, cashier's check or certified check). If furnishing either a cashier's check or a certified check as the bid security, Bidder shall also include the original check in a sealed envelope to be delivered and received by the Owner at the date, time and place for the bid opening.

No bid shall be withdrawn for a period of forty-five (45) days after receipt of bid.

Complete Bid Documents for this project are available in electronic form. They may be obtained without charge and without deposit from the Designer or Central Bidding. Printed copies are not available from the Designer, but arrangements can be made by bidder to obtain them through most reprographic firms. Plan holders are responsible for their own reproduction costs. Questions about this procedure shall be directed to the Designer at:

WHLC Architecture
1744 Oakdale Dr.
Baton Rouge, LA 70810
225-620-7703
matt@whlcarchitecture.com

A mandatory Pre-Bid Conference is scheduled for Thursday, September 24, 2026, at 2:00pm in the North Oaks Outpatient Diagnostic Center, Auditorium, at 15837 Paul Vega MD Drive, Hammond, LA 70403. Attendance is mandatory.

Interested contractors can contact Gary Vinyard, Director of Plant Operations, at (985) 230-1278 to coordinate pre-bid site visits.

All bidders shall meet the requirements of the State of Louisiana Contractor's Licensing law, Louisiana Revised Statute 37:2150 through 2164, as amended.

Sureties used for obtaining Bonds must appear as acceptable on the Department of Treasury Circular 570.

In accordance with R.S 38:2212 (A) (1)(b), the provisions and requirements stated in the Advertisement for Bids and those required on the Bid Form shall not be considered as informalities and shall not be waived.

Anyone with disabilities requiring special accommodations must contact Grant Sceroler at (985) 230-6105 not later than seven (7) days prior to the bid opening.

The Owner reserves the right to reject any or all bids.

1st Advertisement: September 9, 2026
2nd Advertisement: September 16, 2026
3rd Advertisement: September 23, 2026

AIA® Document A701® – 2018

Instructions to Bidders

for the following Project:
(Name, location, and detailed description)

North Oaks Parking Garage
15790 Paul Vega MD Dr
Hammond, LA 70403

THE OWNER:
(Name, legal status, address, and other information)

Hospital Service District No. 1 of Tangipahoa Parish dba North Oaks Health
15790 Paul Vega MD Dr
Hammond, LA 70403

THE ARCHITECT:
(Name, legal status, address, and other information)

Washer Hill Lipscomb Cabaniss, LLC
1744 Oakdale Drive
Baton Rouge, LA 70810

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ADDITIONS AND DELETIONS:
The author of this document may have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.
It is intended that AIA Document G612™–2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

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ARTICLE 1 DEFINITIONS

§ 1.1 The Bidding Documents include the following:

- Bid Notice (Advertisement)
- Instructions to Bidders, AIA Document A701-2018, Edition as amended by Owner
- Louisiana Uniform Bid Form
- Bid Bond Form
- Contract Between Owner and Contractor, AIA Document A101 – 2017, Edition as amended by Owner along with any of that Agreement's Exhibits
- General Conditions of the Contract for Construction, AIA Document A201 - 2017 Edition as amended by the Owner along with any associated exhibits
- Performance & Payment Bonds' Forms
- Non-Collusion Affidavit
- Attestations Affidavit
- Specifications and Drawings
- Addenda issued prior to the Bid Opening to be acknowledged on the Bid Form
- Any other bid forms or documents enumerated in Article 8 of these Instructions or as may be determined by the Owner to be applicable and published during the Bid period.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an item on the Bid Form that may either increase or decrease the quantity of Work or change the type of Work within the scope of the Project or any material or equipment specified in the Bidding Documents, or both.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents, and may also include a Closed Specification Item.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents and requirements of La. R.S. 37:2150, et seq.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

§ 1.10 For purposes of these Instructions to Bidders, the **AIA Document A101:** Contract Between Owner and Contractor, the **AIA Document A101 Exhibit A**: Insurance and Bonds, and the **AIA Document A201:** General Conditions of the Contract for Construction, may be referred to collectively hereinafter as the "Contract."

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

.1 the Bidder has read and understands the Bidding Documents;

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.2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;

.3 the Bid complies with the Bidding Documents;

.4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Contract Documents;

.5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception or qualification;

.6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor; and

.7 the Bid has been arrived at independently, without consultation, communication or agreement with any other bidder as to any matter relating to this Bid.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Complete Bidding Documents are available in electronic form. They may be obtained without charge and without deposit from WHLC | Architecture or from Central Bidding at www.centralbidding.com. Printed copies are not available from the Designer, but arrangements can be made by the Bidder to obtain them through most reprographic firms. Bidders are responsible for their own reproduction costs. Questions about this procedure may be directed to WHLC | Architecture 1744 Oakdale Drive, Baton Rouge, LA, phone: (225) 767-1530.

§ 3.1.2 NOT USED.

§ 3.1.3 NOT USED.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents, exclusive of substitutions addressed in Section 3.3 below, shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids.
(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution. Unless for an approved Closed Specification, wherever the Owner specifies the name of a certain brand, make, manufacturer, or

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uses a definite specification, the Bidding Documents shall state clearly that they are used only to denote the quality standard and performance requirements of the product desired and that they do not restrict bidders to the specific brand, make, manufacturer, or specifications named, that they are used only to set forth and convey to prospective bidders the general style, type, character, and quality of product desired; and that equivalent products may be acceptable.

§ 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be submitted by the Bidder and received by the Architect at least seven days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 NOT USED.

§ 3.3.2.3 Substitution requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including model numbers, the name of the material or equipment proposed as the substitute, performance and test data, cut sheets and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to all Prime Bidders known by the Architect to have requested a complete set of Bidding Documents. Addenda will be transmitted by e-mail within twenty-four (24) hours of the issuance of the Addendum, but any Addendum that modifies the Bidding Documents which is issued within a period of seven (7) days prior to the advertised time for the opening of Bids, excluding Saturdays, Sundays and any other legal holidays, may be delivered by either facsimile transmission, e-mail, other electronic means, by hand or by overnight delivery using a nationally recognized carrier, provided the Prime Bidder has supplied the facsimile transmission number or e-mail address to the Owner and the Architect.
(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than seventy-two (72) hours, excluding Saturdays, Sundays and any other legal holiday, prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids for up to thirty (30) calendar days without having to re-advertise.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid by the number the Architect has assigned to each of the addenda in the Bid.

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ARTICLE 4 BIDDING PROCEDURES

§ 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted electronically in accordance with Louisiana Revised Statute 38:2212 E(1). Bid related information is also available online and electronic bids must be submitted online at www.centralbidding.com. Please call (225) 810-4814 for all questions regarding the online bid process. The electronic bid must be accompanied by a scanned copy of the bid security being furnished (either Bid Bond, cashier's check or certified check). If furnishing either a cashier's check or a certified check as the bid security, Bidder shall also include the original check in a sealed envelope to be delivered and received by the Owner at the date, time and place for the bid opening.

§ 4.1.2 All blanks on the bid form shall be legibly executed.

§ 4.1.3 Sums shall be legibly expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. Failure to submit alternate prices will be sufficient cause to reject the Bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 A Bidder shall make no additional stipulations on the Bid, nor qualify its Bid in any other manner.

§ 4.1.7 The Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located either as authorized by statute or by submission of a corporate or company resolution, as required in Section 9.4.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.1.9 Pursuant to applicable law, the Owner has elected to designate this Project as exempt from sales and use taxes on materials, supplies, fixtures and equipment, and taxable services and leases and rentals of tangible personal property (collectively "tax exempt purchases") which are used, consumed and/or incorporated into the construction of the Project. The Contractor's Bid shall include all labor, materials and equipment exclusive of sales or use taxes, except for those purchases which are less than $1,000.00. For purchases which are less than $1,000.00, the Contractor and its subcontractors and vendors may either include in the Bid all applicable taxes on such purchases or treat such purchases as tax exempt.

§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:
(Insert the form and amount of bid security.)

Not less than five (5) per cent of the largest possible bid amount of the base bid and any additive Alternates in the form and amount required if so stipulated in the Instructions to Bidders. Bid security shall be either a certified check, cashier's check or Bid Bond.

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall furnish Performance and Payment Bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such Bonds, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

§ 4.2.3 If a surety bond is submitted as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents and the attorney-in-fact who executes the bond on behalf of

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the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. If a Bid Bond is used, it shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key rating Guide or by an insurance company in good standing licensed to write bid bonds which is either domiciled in Louisiana or owned by Louisiana residents.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and Performance and Payment Bonds have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. As soon as the Bids have been compared and evaluated, the Owner will return the bid security to all Bidders, except the three lowest responsible Bidders. When the Contract has been executed, the bid security of the two remaining unsuccessful Bidders will be returned.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:
(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)

All bids are required to be submitted electronically as permitted by LA R.S. 38 22:12 (E) (6). Electronic Bids shall be submitted pursuant to Section 9.2.

§ 4.3.2 NOT USED.

§ 4.3.3 Bids shall be submitted electronically by the date and time indicated in the invitation to bid.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery of the electronic Bid and, if applicable, timely delivery of the cashier's check or certified check to the Owner at the bid opening.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely. For Bids submitted electronically, the last timely Bid submission by each and any Bidder shall be binding.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 No Bidder may withdraw, modify or cancel a Bid within forty-five (45) calendar days after the date for receipt of Bids. Should the date for the award of the Contract be extended by mutual agreement between the Owner and the lowest responsible Bidder, the Bidder may not withdraw, modify or cancel its Bid during the period of extension. Notwithstanding the foregoing, Bids containing patently obvious, unintentional, and substantially mechanical, clerical or mathematical errors, or errors of unintentional omission of a substantial quantity of work, labor, material, or services made directly in the compilation of the Bid, may be withdrawn by the Contractor if clear and convincing sworn, written evidence of such errors is furnished to Owner within forty-eight (48) hours of the **B**id opening, excluding Saturdays, Sundays and legal holidays pursuant to the provisions of La. R.S. §38:2214C.

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids

Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders. The Architect's or the Owner's estimate of probable

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construction cost for the Project shall be made available at the time of the Bid opening, either by posting such estimate electronically or reading it aloud at the time of opening of the Bids.

§ 5.2 Rejection of Bids

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids for just cause. A Bid not accompanied by a required Bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular, is subject to rejection.

§ 5.3 Acceptance of Bid (Award)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in the order in which they are listed on the Bid Form. Determination of the low Bid shall be on the basis of the sum of the Base Bid and any Alternates accepted. However, the Owner reserves the right to accept Alternates in any order which does not affect the determination of the lowest responsive and responsible bidder.

§ 5.3.3 Only for the purpose of interpretation of the Base Bid total and alternate bids, when applicable, written words shall govern if a conflict exists between words and numerals. Further, if the Base Bid or Alternates require unit prices, and there is a discrepancy between the Base Bid total and the sum of the extended unit prices, the unit price bid shall govern.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 Other Information

Other documentation and information, including the attestation affidavit and the E Verification Form, required to be submitted after the opening of Bids shall be furnished by the lowest responsive and responsible Bidder within ten (10) calendar days after the Bid opening. If the apparent low Bidder does not submit the proper information or documentation as required by the Bidding Documents within the ten-day period, such Bidder shall be declared non-responsive, and the Owner may award the Bid to the next lowest responsive Bidder, and afford that Bidder not less than ten days from the date the apparent low Bidder is declared non-responsive, to submit the proper information and documentation as required by the Bidding Documents, and the Owner may continue such process until the Owner either awards the Contract to the lowest responsive bidder who submits the post-bid information per this Section, or rejects all Bids.

§ 6.2 NOT USED.

§ 6.3 Submittals

§ 6.3.1 After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

- **.1** fixed jobsite overhead cost itemized with documentation to support daily rates;
- **.2** bond premium rate with supporting information from the Bidder's surety;
- **.3** a list of names and addresses of all subcontractors (of any tier), suppliers, manufacturers or other persons or entities (including those who are to furnish materials or equipment fabricated to a special design) which are proposed for any portion of the Work. Should the identity of any such suppliers, manufacturers or other persons or entities not be available on the date of the pre-construction conference, bidder shall provide the names and addresses of any such persons or entities at least thirty days before the purchase of any materials, equipment and supplies by such persons or entities; at least thirty (30) days before the purchase of any materials, equipment, or supplies by such persons or entities;
- **.4** a breakdown of the Cost of the Work by line item to be set forth in the Schedule of Values;
- **.5** labor burden by trade for Contractor (Bidder) and its Subcontractors; and
- **.6** internal rate charges for all significant company-owned equipment.

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§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 NOT USED.

§ 6.3.4 Persons and entities proposed by the Bidder must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements

§ 7.1.1 Prior to the execution of the Contract, the Bidder shall furnish a Performance Bond covering the faithful performance of the Contract and a Payment Bond guaranteeing payment of all obligations arising thereunder. Both Bonds shall be separately written, each in the amount of the Contract Sum. The Cost of the Bonds shall be included in the Bid.

§ 7.1.2 The Bonds shall be written by a surety or insurance company currently on the U. S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of A. M. Best's Key Rating Guide, to write individual bonds up to 10 per cent of policyholder's surplus as shown in the A. M. Best's Key Rating Guide, or by an insurance company that is either domiciled in Louisiana or owned by Louisiana residents and is licensed to write surety bonds.

§ 7.1.3 No surety or insurance company shall write a bond which is in excess of the amount indicated as approved by the U. S. Department of the Treasury Financial Management Service list or by a Louisiana domiciled insurance company with an A- rating by A. M. Best up to a limit of ten percent of policyholders' surplus as shown by A. M. Best. Companies authorized by this Section who are not on the Treasury list shall not write a bond when the penalty exceeds fifteen percent of its capital and surplus, such capital and surplus being the amount by which the company's assets exceed its liabilities as reflected by the most recent financial statements filed by the company with the Department of Insurance.

§ 7.1.4 Any surety bond shall be written by a surety or insurance company that is currently licensed to do business in the state of Louisiana.

§ 7.1.5 The Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum for both Bonds.
(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)

§ 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder to whom the Contract is awarded will be required to execute the Contract and furnish the Performance and Payments Bonds not later than ten (10) calendar days from the date when written notice of award is sent to the Bidder by the Owner.

§ 7.2.2 The Performance Bond and Payment Bond shall be written on forms identical to those included in the Bidding Documents.

§ 7.2.3 The bonds shall bear the same date as the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

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ARTICLE 8 ENUMERATION OF THE CONTRACT DOCUMENTS

§ 8.1 Copies of the Contract Documents have been made available to the Bidder and consist of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

.4 Building Information Modeling Exhibit, if completed:

.5 Drawings

See the attached Sheet Index

Number	Title	Date
T1.0	COVER SHEET	September 8, 2026 for all drawings
ADA.1	ADA TYPICAL DETAILS	
LS1.0	LIFE SAFETY PLANS	
C1	DEMO/PHASING PLAN	
C1.1	PROJECT LAYOUT PLAN	
C2.1	LAYOUT PLAN	
C2.2	LAYOUT PLAN	
C3.1	GRADING/DRAINAGE PLAN	
C3.2	GRADING/DRAINAGE PLAN	
C4.1	PAVING PLAN	
C4.2	PAVING PLAN	
C5.1	JOINTING PLAN	
C5.2	JOINTING PLAN	
C6.1	STRIPING/SIGNAGE PLAN	

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C6.2	STRIPING/SIGNAGE PLAN	
C7.1	UTILITY PLAN	
C8.1	JOINTING DETAILS	
C9.1	EROSION CONTROL DETAILS	
C10.1	DRAINAGE DETAILS	
C11.1	STANDARD DETAILS	
S0.1	3D VIEWS	
S1.1	FOUNDATION LEVEL 1 FRAMING PLAN	
S1.2	SLAB LEVEL 1 FRAMING PLAN	
S1.3	ENLARGED FOUNDATION & FIRST LEVEL FRAMING PLANS	
S1.4	FOUNDATION DETAILS - COLUMN SCHEDULE	
S1.5	FOUNDATION DETAILS - COLUMN REINFORCEMENT	
S1.6	FOUNDATION DETAILS - PILES & PILE CAPS	
S1.7	FOUNDATION DETAILS	
S1.8	FOUNDATION DETAILS	
S1.9	FOUNDATION DETAILS	
S2.1	LEVEL 2 FRAMING PLAN	
S2.2	LEVEL 3 FRAMING PLAN	
S2.3	LEVEL 4 FRAMING PLAN (ADD ALTERNATE #1)	
S2.4	LEVEL 5 FRAMING PLAN (ADD ALTERNATE #2)	
S2.5	ROOF FRAMING PLANS	
S3.1	BUILDING SECTIONS	
S4.1	WALL SECTIONS	
S4.2	WALL SECTIONS	
S4.3	WALL SECTIONS	
S4.4	ENLARGED DETAILS	
S5.1	LEVEL 2-5 POST TENSION BEAM DETAILS	
S5.2	LEVEL 2-5 POST TENSION BEAM DETAILS	
S5.3	LEVEL 2-5 POST TENSION BEAM DETAILS	
S5.4	LEVEL 3-5 POST TENSION BEAM DETAILS	
S6.1	ENLARGED ELEVATOR PLANS	
S6.2	ENLARGED STAIR PLANS	

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S6.3	ENLARGED STAIR PLANS/SECTIONS	
S6.4	STAIR SECTIONS	
S7.1	GENERAL NOTES AND TYPICAL DETAILS	
S7.2	TYPICAL DETAILS	
A1.0	ARCHITECTURAL SITE PLAN	
A1.1	ENLARGED SITE PLANS AND SITE DETAILS	
A2.1	LEVEL 1 FLOOR PLAN	
A2.2	LEVEL 2 FLOOR PLAN	
A2.3	LEVEL 3 FLOOR PLAN	
A2.4	LEVEL 4 FLOOR PLAN (ADD ALTERNATE #1)	
A2.5	LEVEL 5 FLOOR PLAN (ADD ALTERNATE #2)	
A4.0	AXONOMETRIC VIEWS	
A4.1	EXTERIOR ELEVATIONS	
A4.2	EXTERIOR ELEVATIONS	
A5.0	WALL SECTIONS	
A5.1	WALL SECTIONS	
A6.0	ENLARGED SECTION & PLAN DETAILS	
A8.0	ENLARGED STAIR AND ELEVATOR PLANS	
A8.1	STAIR SECTIONS	
A8.2	STAIR & ELEVATOR SECTIONS	
A9.0	DOOR SCHEDULE, DOOR AND WINDOW ELEVATIONS	
A11.0	SIGN DETAILS	
M0.0	MECHANICAL COVER SHEET	
M1.0	LEVEL 1 HVAC PLAN	
M1.2	LEVEL 2 HVAC PLAN	
M1.3	LEVEL 3 HVAC PLAN	
M1.4	LEVEL 4 HVAC PLAN (ADD ALTERNATE #1)	
M1.5	LEVEL 5 HVAC PLAN (ADD ALTERNATE #2)	
M2.0	HVAC SCHEDULES AND DETAILS	
P1.1	LEVEL 1 PLUMBING PLAN	
P1.2	LEVEL 2 PLUMBING PLAN	
P1.3	LEVEL 3 PLUMBING PLAN	
P1.4	LEVEL 4 PLUMBING PLAN (ADD ALTERNATE #1)	

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P1.5	LEVEL 5 PLUMBING PLAN (ADD ALTERNATE #2)	
P1.6	LEVEL 1 UTILITY PLAN	
P1.7	LEVEL 2 UTILITY PLAN	
P1.8	LEVEL 3 UTILITY PLAN	
P1.9	LEVEL 4 UTILITY PLAN (ADD ALTERNATE #1)	
P1.10	LEVEL 5 UTILITY PLAN (ADD ALTERNATE #2)	
P1.11	DOMESTIC WATER PIPING DIAGRAM	
P2.0	PLUMBING SCHEDULES AND DETAILS	
SP1.1	LEVEL 1 SPRINKLER PLAN	
SP1.2	LEVEL 2 SPRINKLER PLAN	
SP1.3	LEVEL 3 SPRINKLER PLAN	
SP1.4	LEVEL 4 SPRINKLER PLAN (ADD ALTERNATE #1)	
SP1.5	LEVEL 5 SPRINKLER PLAN (ADD ALTERNATE #2)	
SP2.0	SPRINKLER DETAILS	
E0.0	ELECTRICAL COVER SHEET	
E0.1	ELECTRICAL SITE PLAN - DEMO	
E1.0	ELECTRICAL SITE PLAN - NEW	
E1.1	ELECTRICAL POWER PLAN - 1ST FLOOR	
E1.2	ELECTRICAL POWER PLAN - 2ND & 3RD FLOOR	
E1.3	ELECTRICAL POWER PLAN - 4TH & 5TH FLOOR	
E5.0	ONE-LINE/RISER DIAGRAM - ELECTRICAL	
E6.0	ELECTRICAL SCHEDULES-480V PANELS	
E7.0	ELECTRICAL DETAILS	

.6 Specifications

Section	Title	Date	Pages
All sections	Project Specifications	September 8, 2026	528

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.7 Addenda:

Number	Date	Pages

Addenda will be issued no later than seventy-two (72) hours prior to the date for receipt of Bids.

[ ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017.)

[ ] The Sustainability Plan:

Title	Date	Pages

[ ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents listed below:
(List here any additional documents that are intended to form part of the Contract Documents.)

N/A

ARTICLE 9 MISCELLANEOUS PROVISIONS

§ 9.1 The Bidder agrees to fully complete the Work for the Project within the following number of calendar days from the commencement date set out in a written "Notice to Proceed" issued by the Owner, subject to any extensions of time which have been authorized by a Change Order:

.1 Base Bid: three hundred (300) calendar days

.2 If Alternate No. 1 is accepted, an additional forty-five (45) calendar days will be added to the Base Bid contract time, for a total of three hundred forty-five (345) calendar days;

.3 If Alternate No. 2 is accepted, an additional ninety (90) calendar days will be added to the Base Bid contract time, for a total of three hundred ninety (390) calendar days.

§ 9.2 Unless otherwise directed by the Owner, the Bidder shall mobilize and begin Work on or shortly after the commencement date set out in a Notice to Proceed issued by the Owner.

§ 9.3 The Bidder is required to submit its bid electronically online at CENTRAL BIDDING.COM. Please call (225) 810-4814 for all questions regarding the online bid process. The electronic bid must be accompanied by a scanned copy of the bid security being furnished (either Bid Bond, cashier's check or certified check). If furnishing either a cashier's check or a certified check as the bid security, Bidder shall also include the original check in a sealed

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envelope to be delivered and received by the Owner at the date, time and place of the bid opening. The Bidder shall include the name of the Bidder, the Project number, the Project name and the words "Bid Security for Electronic Bid" on the outside of the sealed envelope.

§ 9.4 A mandatory pre-bid conference will be held at the Project site or other suitable location as set out in the Advertisement at least ten (10) calendar days before the date for receipt of Bids. As a prerequisite for submitting a Bid on the Project, all prospective bidders must appear at or before the start time of the pre-bid conference and complete and sign the attendance form provided by Owner — attendance for the full duration of the pre-bid conference is required. Any revisions made necessary as a result of the pre-bid conference shall not be valid unless included in a written addendum.

§ 9.5 Written evidence of the authority of the person signing the Bid shall be provided in accordance with the provisions of this Section. The authority of the signature of the person submitting the Bid shall be deemed sufficient and acceptable if any of the following conditions are met:

.1 The signature on the Bid is that of any corporate officer listed on the most current annual report on file with the Secretary of State, or the signature on the Bid is that of any member of a partnership, limited liability company, limited liability partnership, or other legal entity listed in the most current business records on file with the Secretary of State;

.2 The signature on the Bid is that of an authorized representative as documented by the legal entity certifying the authority of the person; and.

.3 The legal entity has filed in the appropriate records of the Louisiana Secretary of State, an affidavit, resolution, or other acknowledged or authentic document indicating the names of all parties authorized to submit Bids for public contracts. Such document on file with the Secretary of State shall remain in effect and shall be binding upon the principal until specifically rescinded and canceled from the records of the office.

§ 9.6 It is the Owner's intent to issue the Notice to Proceed for the Project within thirty (30) calendar days from the date of the execution of the Contract. In accordance with Section 7.2.1, the Contract shall be executed and submitted to the Owner within 10 days from the date of the written notice of award issued by the Owner to the lowest responsive and responsible Bidder.

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Additions and Deletions Report for

AIA® Document A701® – 2018

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PAGE 1:

North Oaks Parking Garage
15790 Paul Vega MD Dr
Hammond, LA 70403

Hospital Service District No. 1 of Tangipahoa Parish dba North Oaks Health

15790 Paul Vega MD Dr
Hammond, LA 70403

Washer Hill Lipscomb Cabaniss, LLC

1744 Oakdale Drive

Baton Rouge, LA 70810

8 ENUMERATION OF THE ~~PROPOSED~~ CONTRACT DOCUMENTS

9 MISCELLANEOUS PROVISIONS

PAGE 2:

§ 1.1 The Bidding Documents include the ~~Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions~~following:

Bid Notice (Advertisement)

Instructions to Bidders, AIA Document A701-2018, Edition as amended by Owner

Louisiana Uniform Bid Form

Bid Bond Form

Contract Between Owner and Contractor, AIA Document A101 – 2017, Edition as amended by Owner along with any of

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that Agreement's Exhibits

General Conditions of the Contract for Construction, AIA Document A201 - 2017 Edition as amended by the Owner along with any associated exhibits

Performance & Payment Bonds' Forms

Non-Collusion Affidavit

Attestations Affidavit

Specifications and Drawings

Addenda issued prior to the Bid Opening to be acknowledged on the Bid Form

Any other bid forms or documents enumerated in Article 8 of these Instructions or as may be determined by the Owner to be applicable and published during the Bid period.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other ~~Proposed~~ Contract Documents apply to the Bidding Documents.

§ 1.6 An Alternate Bid (or Alternate) is an ~~amount stated in~~item on the Bid ~~to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted~~Form that may either increase or decrease the quantity of Work or change the type of Work within the scope of the Project or any material or equipment specified in the Bidding Documents, or both.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents, and may also include a Closed Specification Item.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents and requirements of La. R.S. 37:2150, et seq.

§ 1.10 For purposes of these Instructions to Bidders, the AIA Document A101: Contract Between Owner and Contractor, the AIA Document A101 Exhibit A: Insurance and Bonds, and the AIA Document A201: General Conditions of the Contract for Construction, may be referred to collectively hereinafter as the "Contract."

PAGE 3:

.4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the ~~Proposed~~ Contract Documents;

.5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception~~; and~~ or qualification;

.6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor; and

.7 the Bid has been arrived at independently, without consultation, communication or agreement with any other bidder as to any matter relating to this Bid.

§ 3.1.1 ~~Bidders shall obtain complete~~ Complete Bidding Documents~~, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.~~

~~(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)~~

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§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refundedare available in electronic form. They may be obtained without charge and without deposit from WHLC | Architecture or from Central Bidding at www.centralbidding.com. Printed copies are not available from the Designer, but arrangements can be made by the Bidder to obtain them through most reprographic firms. Bidders are responsible for their own reproduction costs. Questions about this procedure may be directed to WHLC | Architecture 1744 Oakdale Drive, Baton Rouge, LA, phone: (225) 767-1530.

§ 3.1.2 NOT USED.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.NOT USED.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents, exclusive of substitutions addressed in Section 3.3 below, shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids.

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§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution. Unless for an approved Closed Specification, wherever the Owner specifies the name of a certain brand, make, manufacturer, or uses a definite specification, the Bidding Documents shall state clearly that they are used only to denote the quality standard and performance requirements of the product desired and that they do not restrict bidders to the specific brand, make, manufacturer, or specifications named, that they are used only to set forth and convey to prospective bidders the general style, type, character, and quality of product desired; and that equivalent products may be acceptable.

§ 3.3.2.1 Written requests for substitutions shall be submitted by the Bidder and received by the Architect at least ten. seven days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding DocumentsNOT USED.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including model numbers, the name of the material or equipment proposed as the substitute, performance and test data, and cut sheets and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.4.1 Addenda will be transmitted to all Prime Bidders known by the issuing office to have received complete Bidding Documents the Architect to have requested a complete set of Bidding Documents. Addenda will be transmitted by e-mail within twenty-four (24) hours of the issuance of the Addendum, but any Addendum that modifies the Bidding Documents which is issued within a period of seven (7) days prior to the advertised time for the opening of Bids, excluding Saturdays, Sundays and any other legal holidays, may be delivered by either facsimile transmission, e-mail, other electronic means, by hand or by overnight delivery using a nationally recognized carrier, provided the Prime Bidder has supplied the facsimile transmission number or e-mail address to the Owner and the Architect.

§ 3.4.3 Addenda will be issued no later than four days seventy-two (72) hours, excluding Saturdays, Sundays and any other legal holiday, prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids for up to thirty (30) calendar days without having to re-advertise.

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§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid by the number the Architect has assigned to each of the addenda in the Bid.

§ 4.1.1 Bids shall be submitted ~~on the forms included with or identified in the Bidding Documents~~electronically in accordance with Louisiana Revised Statute 38:2212 E(1). Bid related information is also available online and electronic bids must be submitted online at www.centralbidding.com. Please call (225) 810-4814 for all questions regarding the online bid process. The electronic bid must be accompanied by a scanned copy of the bid security being furnished (either Bid Bond, cashier's check or certified check). If furnishing either a cashier's check or a certified check as the bid security, Bidder shall also include the original check in a sealed envelope to be delivered and received by the Owner at the date, time and place for the bid opening.

§ 4.1.2 All blanks on the bid form shall be legibly executed. ~~Paper bid forms shall be executed in a non-erasable medium.~~

§ 4.1.3 Sums shall be legibly expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on ~~paper~~ bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. Failure to submit alternate prices will be sufficient cause to reject the Bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 ~~Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.~~ A Bidder shall make no additional stipulations on the Bid, nor qualify its Bid in any other manner.

§ 4.1.7 ~~Each copy of the~~ The Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. ~~Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.~~ either as authorized by statute or by submission of a corporate or company resolution, as required in Section 9.4.

§ 4.1.9 Pursuant to applicable law, the Owner has elected to designate this Project as exempt from sales and use taxes on materials, supplies, fixtures and equipment, and taxable services and leases and rentals of tangible personal property (collectively "tax exempt purchases") which are used, consumed and/or incorporated into the construction of the Project. The Contractor's Bid shall include all labor, materials and equipment exclusive of sales or use taxes, except for those purchases which are less than $1,000.00. For purchases which are less than $1,000.00, the Contractor and its subcontractors and vendors may either include in the Bid all applicable taxes on such purchases or treat such purchases as tax exempt.

Not less than five (5) per cent of the largest possible bid amount of the base bid and any additive Alternates in the form and amount required if so stipulated in the Instructions to Bidders. Bid security shall be either a certified check, cashier's check or Bid Bond.

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§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall ~~, if required,~~ furnish ~~bonds~~ Performance and Payment Bonds covering the faithful performance of the Contract and payment of all

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obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such ~~bonds if required~~ Bonds, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

§ 4.2.3 If a surety bond is ~~required~~submitted as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents~~. The~~ and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. If ~~The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located~~a Bid Bond is used, it shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key rating Guide or by an insurance company in good standing licensed to write bid bonds which is either domiciled in Louisiana or owned by Louisiana residents.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and ~~bonds, if required,~~ Performance and Payment Bonds have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. ~~However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning days after the opening of Bids, withdraw its Bid and request the return of its bid security.~~As soon as the Bids have been compared and evaluated, the Owner will return the bid security to all Bidders, except the three lowest responsible Bidders. When the Contract has been executed, the bid security of the two remaining unsuccessful Bidders will be returned.

All bids are required to be submitted electronically as permitted by LA R.S. 38 22:12 (E) (6). Electronic Bids shall be submitted pursuant to Section 9.2.

§ 4.3.2 ~~Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof~~NOT USED.

§ 4.3.3 Bids shall be submitted electronically by the date and time ~~and at the place~~ indicated in the invitation to bid. ~~Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.~~

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery of ~~at~~ the ~~location designated for receipt of Bids.~~electronic Bid and, if applicable, timely delivery of the cashier's check or certified check to the Owner at the bid opening.

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely~~, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid~~. For Bids submitted electronically, the last timely Bid submission by each and any Bidder shall be binding.

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~~A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.~~

§ 4.4.3 ~~After the date and time designated~~ No Bidder may withdraw, modify or cancel a Bid within forty-five (45) calendar

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days after the date for receipt of Bids~~, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:~~

~~(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)~~. Should the date for the award of the Contract be extended by mutual agreement between the Owner and the lowest responsible Bidder, the Bidder may not withdraw, modify or cancel its Bid during the period of extension. Notwithstanding the foregoing, Bids containing patently obvious, unintentional, and substantially mechanical, clerical or mathematical errors, or errors of unintentional omission of a substantial quantity of work, labor, material, or services made directly in the compilation of the Bid, may be withdrawn by the Contractor if clear and convincing sworn, written evidence of such errors is furnished to Owner within forty-eight (48) hours of the Bid opening, excluding Saturdays, Sundays and legal holidays pursuant to the provisions of La. R.S. §38:2214C.

~~If stipulated in an advertisement or invitation to bid, or when otherwise required by law,~~ Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders. The Architect's or the Owner's estimate of probable construction cost for the Project shall be made available at the time of the Bid opening, either by posting such estimate electronically or reading it aloud at the time of opening of the Bids.

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids for just cause. A Bid not accompanied by a required Bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular, is subject to rejection.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to ~~waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests~~accept Alternates in the order in which they are listed on the Bid Form. Determination of the low Bid shall be on the basis of the sum of the Base Bid and any Alternates accepted. However, the Owner reserves the right to accept Alternates in any order which does not affect the determination of the lowest responsive and responsible bidder.

§ 5.3.~~2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted~~3 Only for the purpose of interpretation of the Base Bid total and alternate bids, when applicable, written words shall govern if a conflict exists between words and numerals. Further, if the Base Bid or Alternates require unit prices, and there is a discrepancy between the Base Bid total and the sum of the extended unit prices, the unit price bid shall govern.

§ 6.1 ~~Contractor's Qualification Statement~~ Other Information

~~Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.~~

~~§ 6.2 Owner's Financial Capability~~

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Other documentation and information, including the attestation affidavit and the E Verification Form, required to be submitted after the opening of Bids shall be furnished by the lowest responsive and responsible Bidder within ten (10) calendar days after the Bid opening. If the apparent low Bidder does not submit the proper information or documentation as required by the Bidding Documents within the ten-day period, such Bidder shall be declared non-responsive, and the Owner may award the Bid to the next lowest responsive Bidder, and afford that Bidder not less than ten days from the date the apparent low Bidder is declared non-responsive, to submit the proper information and documentation as required by the Bidding Documents, and the Owner may continue such process until the Owner either awards the Contract to the lowest

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responsive bidder who submits the post-bid information per this Section, or rejects all Bids.

§ 6.2 NOT USED.

.1 ~~a designation of the Work to be performed with the Bidder's own forces;~~ fixed jobsite overhead cost itemized with documentation to support daily rates;

.2 ~~names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each;~~ ~~and~~ bond premium rate with supporting information from the Bidder's surety;

.3 a list of names ~~of~~and addresses of all subcontractors (of any tier), suppliers, manufacturers or other persons or entities (including those who are to furnish materials or equipment fabricated to a special design) which are proposed for ~~the principal portions of the Work.~~any portion of the Work. Should the identity of any such suppliers, manufacturers or other persons or entities not be available on the date of the pre-construction conference, bidder shall provide the names and addresses of any such persons or entities at least thirty days before the purchase of any materials, equipment and supplies by such persons or entities; at least thirty (30) days before the purchase of any materials, equipment, or supplies by such persons or entities;

.4 a breakdown of the Cost of the Work by line item to be set forth in the Schedule of Values;

.5 labor burden by trade for Contractor (Bidder) and its Subcontractors; and

.6 internal rate charges for all significant company-owned equipment.

§ 6.3.3 ~~Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited~~NOT USED.

§ 6.3.4 Persons and entities proposed by the Bidder ~~and to whom the Owner and Architect have made no reasonable objection~~ must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

§ 7.1.1 ~~If stipulated in the Bidding Documents,~~ Prior to the execution of the Contract, the Bidder shall furnish ~~bonds~~ a Performance Bond covering the faithful performance of the Contract and ~~payment~~ a Payment Bond guaranteeing payment of all obligations arising thereunder. Both Bonds shall be separately written, each in the amount of the Contract Sum. The Cost of the Bonds shall be included in the Bid.

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§ 7.1.2 ~~If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum~~ The Bonds shall be written by a surety or insurance company currently on the U. S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of A. M. Best's Key Rating Guide, to write individual bonds up to 10 per cent of policyholder's surplus as shown in the A. M. Best's Key Rating Guide, or by an insurance company that is either domiciled in Louisiana or owned by Louisiana residents and is licensed to write surety bonds.

§ 7.1.3 No surety or insurance company shall write a bond which is in excess of the amount indicated as approved by the U. S. Department of the Treasury Financial Management Service list or by a Louisiana domiciled insurance company with an A- rating by A. M. Best up to a limit of ten percent of policyholders' surplus as shown by A. M. Best. Companies authorized by this Section who are not on the Treasury list shall not write a bond when the penalty exceeds fifteen percent

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of its capital and surplus, such capital and surplus being the amount by which the company's assets exceed its liabilities as reflected by the most recent financial statements filed by the company with the Department of Insurance.

§ 7.1.~~3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.~~4 Any surety bond shall be written by a surety or insurance company that is currently licensed to do business in the state of Louisiana.

§ 7.1.~~4 Unless otherwise indicated below, the~~5 The Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum for both Bonds.

§ 7.2.1 The Bidder ~~shall deliver~~to whom the ~~required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.~~Contract is awarded will be required to execute the Contract and furnish the Performance and Payments Bonds not later than ten (10) calendar days from the date when written notice of award is sent to the Bidder by the Owner.

§ 7.2.2 ~~Unless otherwise provided, the bonds~~ The Performance Bond and Payment Bond shall be written on ~~AIA Document A312, Performance Bond and Payment Bond.~~forms identical to those included in the Bidding Documents.

§ 7.2.3 The bonds shall ~~be dated on or after the date of~~ bear the same date as the Contract.

ARTICLE 8 ENUMERATION OF THE ~~PROPOSED~~ CONTRACT DOCUMENTS

§ 8.1 Copies of the ~~proposed~~ Contract Documents have been made available to the Bidder and consist of the following documents:

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See the attached Sheet Index

T1.0

COVER SHEET

September 8, 2026 for all drawings

ADA.1

ADA TYPICAL DETAILS

LS1.0

LIFE SAFETY PLANS

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DEMO/PHASING PLAN

C1.1

PROJECT LAYOUT PLAN

C2.1

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LAYOUT PLAN

C2.2

LAYOUT PLAN

C3.1

GRADING/DRAINAGE PLAN

C3.2

GRADING/DRAINAGE PLAN

C4.1

PAVING PLAN

C4.2

PAVING PLAN

C5.1

JOINTING PLAN

C5.2

JOINTING PLAN

C6.1

STRIPING/SIGNAGE PLAN

C6.2

STRIPING/SIGNAGE PLAN

C7.1

UTILITY PLAN

C8.1

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C9.1

EROSION CONTROL DETAILS

C10.1

DRAINAGE DETAILS

C11.1

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SLAB LEVEL 1 FRAMING PLAN

S1.3

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FOUNDATION DETAILS - COLUMN REINFORCEMENT

S1.6

FOUNDATION DETAILS - PILES & PILE CAPS

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FOUNDATION DETAILS

S1.8

FOUNDATION DETAILS

S1.9

FOUNDATION DETAILS

S2.1

LEVEL 2 FRAMING PLAN

S2.2

LEVEL 3 FRAMING PLAN

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528

September 8, 2026

~~.8 Other Exhibits:~~

~~(Check all boxes that apply and include appropriate information identifying the exhibit where required.)~~

~~[ ]~~

Addenda will be issued no later than seventy-two (72) hours prior to the date for receipt of Bids.

[ ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:

~~[ ] The Sustainability Plan:~~

~~Title~~

~~Date~~

~~Pages~~

~~[ ] Supplementary and other Conditions of the Contract:~~

~~Document~~

~~Title~~

~~Date~~

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~~.9 Other documents listed below:~~

~~(List here any additional documents that are intended to form part of the Proposed Contract Documents.)~~

[ ] The Sustainability Plan:

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Pages

[ ] Supplementary and other Conditions of the Contract:

Document

Title

Date

Pages

.9 Other documents listed below:

(List here any additional documents that are intended to form part of the Contract Documents.)

N/A

ARTICLE 9 MISCELLANEOUS PROVISIONS

§ 9.1 The Bidder agrees to fully complete the Work for the Project within the following number of calendar days from the commencement date set out in a written "Notice to Proceed" issued by the Owner, subject to any extensions of time which have been authorized by a Change Order:

.1 Base Bid: three hundred (300) calendar days

.2 If Alternate No. 1 is accepted, an additional forty-five (45) calendar days will be added to the Base Bid contract time, for a total of three hundred forty-five (345) calendar days;

.3 If Alternate No. 2 is accepted, an additional ninety (90) calendar days will be added to the Base Bid contract time, for a total of three hundred ninety (390) calendar days.

§ 9.2 Unless otherwise directed by the Owner, the Bidder shall mobilize and begin Work on or shortly after the commencement date set out in a Notice to Proceed issued by the Owner.

§ 9.3 The Bidder is required to submit its bid electronically online at CENTRAL BIDDING.COM. Please call (225) 810-4814 for all questions regarding the online bid process. The electronic bid must be accompanied by a scanned copy of the bid security being furnished (either Bid Bond, cashier's check or certified check). If furnishing either a cashier's check or a certified check as the bid security, Bidder shall also include the original check in a sealed envelope to be delivered and received by the Owner at the date, time and place of the bid opening. The Bidder shall include the name of the Bidder, the Project number, the Project name and the words "Bid Security for Electronic Bid" on the outside of the sealed envelope.

§ 9.4 A mandatory pre-bid conference will be held at the Project site or other suitable location as set out in the Advertisement at least ten (10) calendar days before the date for receipt of Bids. As a prerequisite for submitting a Bid on the Project, all prospective bidders must appear at or before the start time of the pre-bid conference and complete and sign the attendance form provided by Owner — attendance for the full duration of the pre-bid conference is required. Any revisions made necessary as a result of the pre-bid conference shall not be valid unless included in a written addendum.

§ 9.5 Written evidence of the authority of the person signing the Bid shall be provided in accordance with the provisions of this Section. The authority of the signature of the person submitting the Bid shall be deemed sufficient and acceptable if any of the following conditions are met:

.1 The signature on the Bid is that of any corporate officer listed on the most current annual report on file with the Secretary of State, or the signature on the Bid is that of any member of a partnership, limited liability company, limited liability partnership, or other legal entity listed in the most current business records on file with the Secretary of State;

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_____.2 The signature on the Bid is that of an authorized representative as documented by the legal entity certifying the authority of the person; and.

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.3 The legal entity has filed in the appropriate records of the Louisiana Secretary of State, an affidavit, resolution, or other acknowledged or authentic document indicating the names of all parties authorized to submit Bids for public contracts. Such document on file with the Secretary of State shall remain in effect and shall be binding upon the principal until specifically rescinded and canceled from the records of the office.

§ 9.6 It is the Owner's intent to issue the Notice to Proceed for the Project within thirty (30) calendar days from the date of the execution of the Contract. In accordance with Section 7.2.1, the Contract shall be executed and submitted to the Owner within 10 days from the date of the written notice of award issued by the Owner to the lowest responsive and responsible Bidder.

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Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 13:41:55 CDT on 09/08/2026 under Order No. 20250144530 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A701™ - 2018, Instructions to Bidders, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

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LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: Hospital Service District No. 1 of Tangipahoa
D.B.A. North Oaks Health
15790 Paul Vega MD Drive
Hammond, LA 70403

BID FOR: NORTH OAKS HEALTH PARKING GARAGE
Construction of a new parking garage to include a Base Bid and 2 Alternates. Base Bid is for a total of three (3) floors; Alternate #1 is for a total of four (4) floors; Alternate #2 is for a total of five (5) floors.

The undersigned bidder hereby declares and represents that she/he; a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by: Washer Hill Lipscomb Cabaniss Architecture (LA) LLC (WHLC Architecture) and dated: September 9, 2026.
(Owner to provide name of entity preparing bidding documents.)

Bidders must acknowledge all addenda. The Bidder acknowledges receipt of the following **ADDENDA:** (Enter the number the Designer has assigned to each of the addenda that the Bidder is acknowledging) _____ .

TOTAL BASE BID: For all work required by the Bidding Documents (including any and all unit prices designated "Base Bid" * but not alternates) the sum of:

_____ Dollars ($ _____)

Base Bid Construction Time 300 calendar days

ALTERNATES: For any and all work required by the Bidding Documents for Alternates including any and all unit prices designated as alternates in the unit price description.

Alternate No. 1 *(Add 4th Floor)* for the lump sum of:

_____ Dollars ($ _____)

Base Bid and Alternate No. 1 Construction Time 345 calendar days

Alternate No. 2 *(Add 5th Floor)* for the lump sum of:

_____ Dollars ($ _____)

Base Bid and Alternate No. 2 Construction Time 390 calendar days

NAME OF BIDDER: _____

ADDRESS OF BIDDER: _____

_____

LOUISIANA CONTRACTOR'S LICENSE NUMBER: _____

NAME OF AUTHORIZED SIGNATORY OF BIDDER: _____

TITLE OF AUTHORIZED SIGNATORY OF BIDDER: _____

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER **: _____

DATE: _____

* The Unit Price Form shall be used if the contract includes unit prices. Otherwise it is not required and need not be included with the form. The number of unit prices that may be included is not limited and additional sheets may be included if needed.

** If someone other than a corporate officer signs for the Bidder/Contractor, a copy of a corporate resolution or other signature authorization shall be required for submission of bid. Failure to include a copy of the appropriate signature authorization, if required, may result in the rejection of the bid unless bidder has complied with La. R.S. 38:2212(A)(1)(c) or RS 38:2212(O) .

BID SECURITY in the form of a bid bond, certified check or cashier's check as prescribed by LA RS 38:2218.A is attached to and made a part of this bid.

LOUISIANA UNIFORM PUBLIC WORK BID FORM
UNIT PRICE FORM

TO: _____
_____
_____
_____
(Owner to provide name and address of owner)

BID FOR: _____
_____
_____
_____
(*Owner to provide name of project and other identifying information)*

UNIT PRICES: This form shall be used for any and all work required by the Bidding Documents and described as unit prices. Amounts shall be stated in figures and only in figures.

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

Wording for "DESCRIPTION" is to be provided by the Owner.
All quantities are estimated. The contractor will be paid based upon actual quantities as verified by the Owner.

AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

North Oaks Health Parking Garage
15790 Paul Vega MD Dr
Hammond, LA 70403

THE OWNER:
(Name, legal status and address)

Hospital Service District No. 1 of Tangipahoa Parish dba North Oaks Health
15790 Paul Vega MD Dr
Hammond, LA 70403

THE ARCHITECT:
(Name, legal status and address)

Washer Hill Lipscomb Cabaniss, LLC
1744 Oakdale Drive
Baton Rouge,
LA 70810

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work authorized by the Architect and the Architect's consultants under their respective professional services agreements and which are owned by the Owner. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor.

§ 1.1.9 KNOWLEDGE

The terms knowledge, recognize and discover, their respective derivatives, and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows, recognizes, and discovers in exercising appropriately, and in accordance with industry standards, the care, skill, and

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diligence required by the Contract Documents. Analogously, the expression reasonably inferable and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a Contractor familiar with the Project and exercising the care, skill, and diligence required of the Contractor by the Contract Documents.

§ 1.1.10 PROVIDE

When the word "provide" including derivatives thereof is used, it shall mean to properly fabricate, transport, deliver, install, erect, construct, test and furnish all labor, materials, equipment, and related items necessary to complete the Work as required by the Contract Documents.

§ 1.1.11 PERSISTENT

The term "persistent" and other similar expressions, as used in reference to the Contractor, shall be interpreted to mean any combination of material acts and omissions, which causes the Owner or the Architect to reasonably conclude that the Contractor will not complete the Work within the Contract Time, for the Contract Sum or in substantial compliance with the requirements of the Contract Documents.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.2.4 In the event of inconsistencies within or between portions of the Contract Documents, the Contractor shall (1) provide the better quality or greater quantity of Work; or (2) comply with the more stringent requirements, either or both in accordance with the Architect's interpretation. The terms and conditions of this § 1.2.4, however, shall not relieve the Contractor of any of the obligations set forth in Paragraph 3.2, or any other provisions of the Contract Documents.

§ 1.2.4.1 In connection with the Drawings, specified dimensions shall take precedence over scaled measurements, and large-scale drawings take precedence over small scale drawings.

§ 1.2.4.2 Before ordering any materials or performing any Work, the Contractor and each Subcontractor shall verify measurements at the Project Site and shall be responsible for the correctness of such measurements. No additional compensation will be allowed on account of differences between actual dimensions and the dimensions indicated on the Drawings. Any difference between field measurements and dimensions set out in the Contract Documents shall be submitted to the Architect for resolution before proceeding with the Work.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

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§ 1.4 Interpretation

In the interest of brevity, the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Owner shall be deemed the owner of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Owner's reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site.

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§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or persistently fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. The Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in strict accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents. The Contractor and each Subcontractor have evaluated and satisfied themselves as to the conditions and limitations under which the Work is to be performed, including, without limitation (1) the location, condition, layout and nature of the Project site and surrounding areas; (2) the prevailing climatic conditions; (3) anticipated labor supply and costs; (4) availability and cost of materials, tools and equipment; and (5) other similar issues which in any way may affect the cost or time for performing the Work. The Owner assumes no responsibility or liability for the safety of the Project. The Contractor shall be solely responsible for providing a safe place for the performance of the Work. The Owner shall not be required to make any adjustments in either the Contract Sum or the Contract Time in connection with any failure by the Contractor or any Subcontractor to comply with the requirements of the Contract Documents.

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§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents. The Contractor shall satisfy itself as to the accuracy of all grades, elevations, dimensions and locations. In all cases of interconnection of its Work with existing or other work, it shall verify at the site all dimensions relating to such existing or other work which is apparent from a reasonable inspection. Any errors due to the Contractor's failure to so verify all such grades, elevations, locations or dimensions shall be promptly rectified by the Contractor without any additional cost to the Owner or adjustment to the Contract Time.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

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§ 3.4.2 Contractor and its employees, officers, agents, representatives, and Subcontractors shall conduct themselves in an appropriate and professional manner, in accordance with the Owner's requirements, at all times while working on the Project. Any such individual who behaves in an inappropriate manner or who engages in the use of inappropriate language or conduct while on the Owner's property, as determined by the Owner, shall be removed from the Project at the Owner's request. Any such individual shall not be permitted to return to the Project site without the written permission of the Owner. The Owner shall not be responsible or liable to the Contractor or any Subcontractor for any additional costs, expenses, losses, claims or damages incurred by Contractor or its Subcontractor as a result of the removal of an individual from the Owner's property pursuant to this Section. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.7.

§ 3.6 Taxes The State of Louisiana, through the Department of Revenue, requires contractors to pay Sales and Use Taxes on materials, supplies, fixtures and equipment and taxable services and leases and rentals of tangible personal property [collectively "tax exempt purchases"] which are used, consumed and/or incorporated into the construction of the Project. Under Louisiana law, the Owner is exempt from the payment of such taxes pursuant to a specific statute. In order for the Owner to benefit from its exempt status in connection with this Project, the Owner has elected to designate the Contractor, its Subcontractors and their Vendors or Suppliers as agents of the Owner for the tax exempt or Suppliers shall execute a form attached hereto as Exhibit 1 which designates them as the Owner's agent for the tax exempt purchases, subject to the specific terms and conditions set forth herein. The Contractor's bid shall include all labor, materials and equipment exclusive of sales or use taxes, except for those purchases which are less than $1,000. For purchases which are less than $1,000. Contractor and its Subcontractors and Vendors may either include in the bid all applicable taxes on such purchases or treat such purchases as tax exempt.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 The Contractor shall include in the Contract Sum and secure, pay for, and, as soon as practicable, furnish the Owner with copies or certificates of all permits including, without limitation, all building permits as required by governmental authorities having jurisdiction over the Project, and fees, licenses, and inspections necessary for the proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. The Owner shall retain the right to secure and pay for any building permits, and such permits will not be included in the Contract Sum. The Contractor will cooperate with the Owner and assist as reasonably necessary in the permitting process.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

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§ 3.7.4 Concealed or Unknown Conditions

Contractor represents that it has investigated the site and is familiar with all known, apparent, or reasonably discoverable conditions, subsurface or otherwise, which will be encountered at the site, and that Contractor has taken those conditions into account in establishing the Contract Sum and the Contract Time, as well as all other conditions concerning the performance of the Work, including without limitation, underground and above ground utilities, work space restrictions, work-hour restrictions, noise restrictions, restrictions on site ingress and egress, weather conditions, ground water, dewatering requirements, temporary and permanent utilities relocation, ventilation requirements, and all other restrictions, demands, and requirements needed for the timely and adequate performance of the Work required by the Contract Documents, and all such conditions have been assumed by Contractor and are reflected and incorporated into the Contract Sum and the Contract Time. Subject to the foregoing, if the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under and allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

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§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. For projects with a Contract Sum greater than $500,000.00, the Contractor shall include with the schedule, for the Owner's and Architect's information, network analysis (CPM) that identifies those tasks which are on the critical path, i.e. where any delay in the completion of these tasks will lengthen the Project's completion, unless appropriate action is taken. A revised and updated schedule shall be submitted with each Application and Certificate for Payment. The Owner shall not have any obligation to make payment for each Application for Payment until the revised and updated schedule is received by the Owner.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.10.4 In the event the Architect determines that the performance of the Work has not progressed or reached the level of completion required by the Contract Documents, the Owner, upon the recommendation of the Architect, shall have the right to order the Contractor to take corrective measures necessary to expedite the progress of the construction, including, without limitation, (1) working additional shifts or overtime, (2) supplying additional manpower, equipment, and facilities, and (3) other similar measures (hereinafter referred to as "Recovery Measures"). Such Recovery Measures shall continue until the progress of the Work achieves the stage of completion required by the Contract Documents. The Owner's right to require Recovery Measures is solely for the purpose of ensuring the Contractor's compliance with the construction schedule.

§ 3.10.4.1 The Contractor shall not be entitled to an adjustment in the Contract Sum in connection with Recovery Measures required by the Owner under or pursuant to this Paragraph 3.10.4, unless the Recovery Measures were directed by the Owner to recover from delays for which the Contractor was entitled to an extension of the Contract Time pursuant to the Contract Documents, and said extension of time was timely and properly requested by Contractor and improperly denied by Owner.

§ 3.10.4.2 The Owner may exercise the rights provided to the Owner under or pursuant to this Paragraph 3.10.4 as frequently as the Owner deems necessary to ensure that the Contractor's performance of the Work will comply with the completion date set forth in the Contract Documents.

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§ 3.10.4.3 Submittal by the Contractor of a schedule or other documentation showing a completion date for the Work prior to the completion date stated in the Contract shall not impose any obligation or responsibility on the Owner or the Architect for the earlier completion date.

§ 3.10.4.4 In the event the Owner employs or contracts with a person or entity for commissioning services and/or quality assurance, the Contractor shall cooperate fully in the commissioning and/or quality assurance process and shall require all subcontractors and others under its control to cooperate.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form acceptable to the Owner, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed. This requirement is essential to the contract. The Architect shall determine the value of these documents, and this amount shall not be approved for payment to the Contractor until all of the listed documents are delivered to the Architect in good order, completely marked with field changes and otherwise complete in all aspects.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop

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Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional and that professional shall comply with reasonable requirements of the Owner regarding qualifications and insurance. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Architect has provided the Contractor with the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the purpose of checking for conformance with information given and the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.12.11 Except for mitigating lead times or pricing increases, the Contractor shall make every reasonable effort to timely order materials in a manner which minimizes the possibility of any return or restocking fees, shipping charges or any other related costs for such material.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. The Contractor shall use its best efforts to minimize any interference with the occupancy or beneficial use of any of the Owner's areas and buildings adjacent to the site of the Work. Without prior approval of the Owner, the Contractor will not permit any workers to use any existing facilities at the Project site, including without limitations, lavatories, toilets, entrances and parking areas other than those designated for such use by the Owner.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or

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by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. If, upon one (1) business day's notice to Contractor by the Owner, that the construction site or surrounding area needs to be made free of litter, waste materials, debris, rubbish or other unsightly material, and the Contractor fails to promptly commence such clean-up, the Owner may commence with such clean-up and deduct the cost of such clean-up from the Contractor's subsequent Applications for Payment. All litter on the job site should be picked up and disposed of on a daily basis. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees and expenses and costs, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, and caused by the negligent acts or omissions, or breach of contract of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement. The term Architect, when used in the Contract Documents, shall mean the prime Designer (Architect, Engineer, or Landscape Architect), or his authorized representative, lawfully licensed to practice architecture, engineering, or landscape architecture in the State of Louisiana, identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number.

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§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment and, and with the concurrence of the Owner, the Architect will provide services from time to time during the one-year period for correction of the Work as described in Section 12.2. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at least weekly, and at intervals appropriate to the stage of construction, to become generally familiar with and to keep the Owner informed about the progress and quality of the Work completed, and to determine in general if the Work is being performed in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due to the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, for the purpose of checking for conformance with information given and the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

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§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives. There will be no restriction on the Owner having a representative.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 NOT USED.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, at the pre-construction conference, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection. Owner reserves the right to approve or disapprove, at its sole discretion, of any Subcontractor or supplier proposed by Contractor. No payments will be due and payable to the Contractor until the Contractor submits the information required in this Section.

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§ 5.2.2 The Contractor shall be solely responsible for selection and performance of all Subcontractors and suppliers. The Contractor shall not be entitled to an increase in the Contract Time or the Contract Sum due to a problem with performance or non-performance of a Subcontractor or supplier, or the additional cost incurred by Contractor in replacing a Subcontractor who has been rejected by Owner and Architect for cause pursuant to this Section. The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. However, Contractor shall not select or utilize any Subcontractor who has been placed in default, and/or has been terminated, and/or has abandoned the Work on any previous project.

§ 5.2.3 The Contractor shall notify the Owner in writing when a Subcontractor is to be replaced and substituted with another Subcontractor.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. The Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the Subcontract to a successor contractor or other entity, the Owner shall not be legally responsible for all of the successor contractor's obligations under the Subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

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§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

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§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work. Except as permitted in Section 7.3 and Paragraph 9.7.2, a change in the Contract Sum or the Contract Time may be accomplished only by Change Order or by a Construction Change Directive signed by the Owner's representative. Accordingly, no course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work and no claim that Owner has been unjustly enriched by any alteration of or addition to the Work, whether or not there is, in fact, any unjust enrichment to the Owner, shall be the basis of any claim for an increase in the amount due under the Contract Documents or a change in the Contract Time or any time period provided for in the Contract Documents.

§ 7.1.4 Atthe pre-construction conference, the Contractor is to provide the following submittals:

.1 Fixed job site overhead cost itemized with documentation to support daily rates;
.2 Bond premium rate with supporting information from the General Contractor's surety;
.3 Labor burden by trade for Contractor and its Subcontractors. The labor burden shall be supported and documented by providing Worker's Compensation and Employer's Liability Insurance Policy Information Page and any other costs that comprise the Labor burden;
.4 Internal rate charges for all significant company-owned equipment;
.5 A designation of the Work to be performed with the Contractor's own forces;
.6 A list of names and addresses of all Subcontractors (of any tier), suppliers, manufacturers or other persons or entities (including those who are to furnish materials or equipment fabricated to a special design) which are proposed for any portion of the Work. Contractor and its Subcontractors are encouraged to consider purchasing materials, equipment and supplies through Premier Purchasing Partners, L.P., a group purchasing organization from whom the Owner regularly purchases materials, equipment and supplies in connection with their operations. Should the identity of any such suppliers, manufacturers or other persons or entities not be available on the date of the pre-construction conference, Contractor shall provide the names and addresses of any such persons or entities at least thirty days before the purchase of any materials, equipment and supplies by such persons or entities;
.7 A breakdown of the Cost of the Work by line item to be set forth in the Schedule of Values.

§ 7.1.5 If the Contractor fails to submit the required submittals in 7.1.4, the Owner shall not have any obligation to make payments to the Contractor in connection with any Application for Payment until such time when Owner receives such submittals.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, the Architect, and the Contractor issued after execution of the Contract, authorizing a change in the Work and/or an adjustment in the Contract Sum and/or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates his agreement therewith, including the adjustment in the Contract Sum or the Contract Time. Any reservation of rights, stipulation, or other modification made on the Change Order by the Contractor shall have no effect.

§ 7.2.2 "Cost of the Work" for the purpose of Change Orders shall be the eligible costs required to be incurred in performance of the Work and paid by the Contractor and Subcontractors. Eligible costs shall be limited to:

.1 Actual wages paid directly to labor personnel, with a labor burden markup exclusively limited to applicable payroll taxes, worker's compensation insurance, unemployment compensation, and social security taxes for those labor personnel performing the Work. Wages shall be the basic hourly labor rate paid to an employee exclusive of fringe benefits or other employee costs. The labor burden percentage for the "Cost of the Work" is limited to categories listed herein;

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.2 Cost of all materials and supplies, including the identification of each item and its cost including taxes;

.3 Actual documented, paid rental costs to third parties for each necessary piece of machinery and equipment required to perform the Work, identifying each item and its individual cost, excluding taxes;

.4 Bond costs: Bond premiums may be included where the documented cost of the premiums has been increased due to the Change Order, but only after the markup is added to the Cost of the Work. Contractor shall provide Owner with documentary proof of such increases in premiums.

§ 7.2.3 "Overhead and Profit": Contractor and Subcontractor shall be due job-site and home office fixed overhead and profits on the Cost of the Work for the purposes of Change Orders, but the combined total of such overhead and profit payable by Owner shall not exceed a total of 16% of the direct cost of any portion of the Work, regardless of the number or tiers of Subcontract work, as specifically set out in §7.2.4.

For a CMAR project, the combined total of such overhead and profit payable by Owner shall not exceed a total of the agreed upon CMAR fee percentage + 8% of the direct cost of any portion of the Work, regardless of the number or tiers of Subcontract work, as specifically set out in §7.2.4.

The credit to the Owner resulting from a change in the Work shall be the sum of those items above, including overhead and profit. Where a change results in both credits to the Owner and extras to the Contractor for related items, overhead and profit shall be computed for credits to the Owner and extras to the Contractor. The Owner shall receive full credit for the computed overhead and profit on credit change order items.

§ 7.2.4 The cost to the Owner resulting from a change in the Work shall be the sum of "Cost of the Work" (as defined at 7.2.2 and 7.2.8) and "Overhead and Profit" with the Overhead and Profit computed as follows:

.1 When all of the work is General Contract work: the agreed upon CMAR fee percentage if for a CMAR project (as referenced in Section 7.2.3) or otherwise 8% markup on the Cost of the Work.

.2 When the work is all Subcontract work: 8% markup on the Cost of the Work for Subcontractor's Overhead and Profit, plus the agreed upon CMAR fee percentage (if for a CMAR project as referenced in Section 7.2.3) or otherwise 8% markup by the General Contractor on the Subcontractor's Cost of the Work but not on the Subcontractor's Overhead and Profit.

.3 When the work is a combination of General Contract work and Subcontract work: that portion of the direct cost that is General Contract work shall be computed per 7.2.4.1 and that portion of the direct cost that is Subcontract work shall be computed per 7.2.4.2.

Bonds premiums may be included, but after the markup is added to the Cost of the Work. Premiums for the Subcontractor's Bond shall not be included.

§ 7.2.4.4 Subcontract cost shall consist of the items in 7.2.2 above plus Overhead and Profit as defined in 7.2.3.

§ 7.2.5 Before a Change Order is prepared, the Contractor shall provide and deliver to the Architect and Owner the following information concerning the Cost of the Work, not subject to waiver, within a reasonable time after being notified to prepare said Change Order:

.1 Detailed itemized list of labor, material and equipment costs for the General Contractor's work including quantities and unit costs for each item of labor, material and equipment; and

.2 An itemized list of labor, material and equipment costs for each Subcontractor's and/or Sub-Subcontractor's work including quantities and unit costs for each item of labor, material and equipment.

.3 The Contractor shall provide supporting documentation as may be requested by the Architect or Owner for any Cost of the Work to be included in a Change Order.

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§ 7.2.6 After a Change Order has been approved, no future requests for extensions of time or additional cost shall be considered nor recoverable for that Change Order work.

§ 7.2.7 Extended fixed job-site costs are indirect costs that are necessary to support the work in the field. Examples of fixed job-site costs are field office rental, salaries of field office staff, field office utilities and telephone.

Extended fixed job-site costs or equitable adjustment may be included in a Change Order due to a delay in the critical path, with the exception of weather-related delays. In the event of a delay in the critical path, the Contractor shall submit all changes or adjustments to the Contract Time within twenty-one (21) days of the event giving rise to the delay. The Contractor shall submit documentation and justification for the adjustment by performing a critical path analysis of its most recent schedule in use prior to the change, which shows an extension in critical path activities.

The Contractor shall notify the Architect and the Owner in writing that the Contractor is making a claim for extended fixed jobsite overhead as required by Section 15.1.2. The Contractor shall provide proof that the Contractor is unable to mitigate financial damages through Replacement Work within this Contract or replacement work. "Replacement Work" is that work which the Contractor is obligated to perform under any construction contract separate from this Contract. Reasonable proof shall be required by the Architect that the delays affected the Completion Date.

§ 7.2.8 Cost of the Work, whether General Contractor cost or Subcontractor cost, shall not include any of the following:

.1 Salaries or other compensation of the Contractor's personnel at the Contractor's principal office and branch offices;
.2 Any part of the Contractor's capital expenses, including interest on the Contractor's capital employed for the Work;
.3 Overhead and general expenses of any kind or the cost of any item not specifically and expressly included above in Cost of the Work, including but not limited to, administrative time or costs related to preparing or processing Change Orders or CCDs or obtaining pricing, quotes, proposals or estimates;
.4 Cost of supervision not specifically required by the Change Order;
.5 That portion of the cost of labor burden which includes fringe benefits, company-issued bonuses, health insurance and any other cost or benefit which is not specifically and expressly included as a Cost of the Work identified in Section 7.2.2;
.6 Any other costs not allowed by provisions included in Section 7.9 of the AIA A133 Agreement if applicable;
.7 Overhead and profit on rental of equipment and/or any costs related to incidental small tools of a specific trade (i.e., shovels, saws, hammers, ladders, air compressors, etc.,);
.8 Charges related to vehicles, whether for general use or specialized trade use, including but not limited to, for moving items around the site, mileage, trip charges or fuel;
.9 Any costs of travel, lodging, and/or meals are not eligible and shall not be included. For the avoidance of doubt, labor shall not be included for travel time nor shall mileage, fuel or incidentals for travel from "out of town";
.10 Unless approved in advance by the Owner, no overtime rates shall be included; Regardless of the Contractor or trade working a compressed work week, including but not limited to, a 4-day,10-hour shift schedule, the Owner will not be charged overtime for any hours which fall on a weekday.
.11 Commercial General Liability, Automobile Liability, and all other required insurances, where referenced in the Contract shall be considered part of normal overhead. These costs are already compensated by the Overhead and Profit markup;
.12 Any costs related to software or the use thereof, including but not limited to BIM;
.13 Incidental consumables are not eligible costs and shall not be included; and
.14 Overhead and profit on transportation, freight, fuel surcharges, restocking fees, delivery or any other fees or related charges.

§ 7.2.9 When applicable as provided by the Contract, the cost to Owner for Change Orders shall be determined by quantities and unit prices. The quantity of any item shall be as submitted by the Contractor and approved by the Architect. Unit prices shall cover cost of Material, Labor, Equipment, Overhead and Profit.

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§ 7.2.10 Each Change Order which adds an amount of ten (10%) per cent or more of the original Contract Sum and which additional amount is at least $10.000.00. or all Change Orders to the Contract which in the aggregate have a value of twenty (20%) per cent or more of the original Contract Sum and which additional amount is at least $10.000.00. shall be filed by the Contractor for recordation with the Clerk of Court for the Parish of Tangipahoa. State of Louisiana.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

.2 Unit prices stated in the Contract Documents or subsequently agreed upon;

.3 Cost to be determined in a reasonable manner acceptable to the Owner and calculated in accordance with §7.2, but not to exceed a specified amount; or

.4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in §7.2 of these General Conditions. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the allowable costs under Section 7.2:

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order. Any reservation of rights, stipulation, or other modification made on the Construction Change Directive by the Contractor shall have no effect.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost including overhead and profit in accordance with Sections 7.2.3 and 7.2.4 and as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase or net decrease, if any, with respect to that change.

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§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect has authority, with the approval of the Owner, to order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.1.5 The Contract Time shall not be changed by the Contractor's submission of a schedule which shows a completion date earlier than the Contract completion date, unless specifically authorized by Change Order.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work. The Contractor agrees to commence work not later than fourteen (14) days after the transmittal date of a written notice to proceed from the Owner and to substantially complete the Project within the Contract Time. The Owner will suffer financial loss if the Project is not substantially complete in the time set forth in the Contract Documents. The Contractor and the Contractor's surety shall be liable for and shall pay to the Owner the sum stated in the Contract Documents as fixed, agreed upon liquidated damages for each consecutive calendar day (Saturdays, Sundays, and holidays included) of delay until the Work is substantially complete. Such Liquidated Damages shall be withheld by the Owner from the amounts due to the Contractor for progress and/or final payments.

§ 8.2.2 Except by agreement or instruction of the Owner in writing, the Contractor shall not commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

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§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may recommend, subject to Owner's approval. If the claim is not made within the time limits set out in Article 15, all rights for future claims for that month are waived.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

§ 8.3.4 If the Contractor submits a schedule or a progress report indicating, or which otherwise expresses an intention to achieve, completion of the Work prior to any completion date required by the Contract Documents or the expiration of the Contract Time, the Owner will not be liable to the Contractor for any failure of the Contractor to so complete the Work by such date or time.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a detailed schedule of values to the Owner and Architect before the first Application for Payment allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Owner and Architect. This schedule, unless objected to by the Owner or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values must be pre-approved in writing by the Owner and Architect.

§ 9.3 Applications for Payment

§ 9.3.1 Monthly, the Contractor shall submit to the Architect an Application and Certificate for Payment on the AIA Document G702-1992, accompanied by AIA Document G703 -1992, and supported by any additional data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents. Once the Schedule of Values is submitted at the Pre-Construction Conference, the Schedule shall not be changed or modified without approval from the Owner and Architect. An Application for Payment shall be submitted on or about the first of each month for the value of labor and materials incorporated into the Work and of materials, suitably stored, at the site as of the twenty-fifth day of the preceding month, less normal retainage, per La. R.S. 38:2248 as set out below

§ 9.3.1.1 Retainage to be withheld on projects with a Contract Sum up to $500,000.00 shall be 10% of the Contract Sum.

§ 9.3.1.2 Retainage to be withheld on projects with a Contract Sum of $500,000.00 or more shall be 5% of the Contract Sum.

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§ 9.3.1.3 Each Application for Payment shall be accompanied by the following, all in the form and substance satisfactory to the Owner:

.1 A current Contractor's claim and lien waiver duly executed and an acknowledged sworn statement showing that all Subcontractors and materialmen with whom the Contractor has entered into subcontracts or purchase orders, the amount of each such Subcontract or purchase order, the amount requested for any Subcontractor and materialmen and the requested progress payment and the amount to be paid to the Contractor for such progress payment, together with similar sworn statements from all such Subcontractors and materialmen;

.2 Duly executed waivers of mechanics' and materialmen's claims and liens from all Subcontractors and, when appropriate, from materialmen and lower tier Subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or persons in any previous Application for Payment; and

.3 All information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner or the Architect.

.4 Current revised and updated Project schedule.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. Payments for materials or equipment stored on or off the site shall be conditioned upon submission by the Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, including applicable insurance.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

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§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

.1 defective Work not remedied;

.2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;

.3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

.5 damage to the Owner or a Separate Contractor;

.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or

.7 persistent failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect, and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment to the Contractor within thirty (30) days after receipt of such Certificate of Payment.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner. La. R.S. 9:2784 (A) and [C) requires a Contractor or Subcontractor to make payment due to each Subcontractor and supplier within fourteen (14) consecutive days of the receipt of payment from the Owner. If not paid, a penalty in the amount of ½ of 1% per days is due, up to a maximum of 15% from the expiration date until paid. The Contractor or Subcontractor, whichever is applicable, is solely responsible for payment of any such penalty.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and

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suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law. Pursuant to La. R.S. 38:2242, when the Owner receives any claim for nonpayment arising out of the Contract, the Owner shall deduct 125% of such claim from the Contract Sum. The Contractor, or any interested party, may deposit security, in accordance with La. R.S. 38:2242.2, guaranteeing payment of the claim with the Recorder of Mortgages or the Clerk of Court of the Parish where the Project is located. When the Owner receives original proof of such guarantee from the Recorder of Mortgages or the Clerk of Court, the claim deduction will be added back to the Contract Sum.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

§ 9.7.1 If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven (7) days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within twenty (20) days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon fourteen (14) additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.7.2 If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to this Contract or the Contract Documents, that payment will be made promptly upon demand by the Owner. Notwithstanding anything contained in this Contract or the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or if the Owner incurs any costs and expenses recoverable under applicable laws to cure any default of the Contractor in performance of the Work, or to correct defective Work, the Owner will have an absolute right to offset that amount against the Contract Sum and may, in the Owner's sole discretion, elect either to:

.1 Deduct an amount equal to that which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner; or

.2 Issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the

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Work for its intended use and the Owner has received a Certificate of Occupancy from regulatory authorities having jurisdiction over the Project.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. When applicable, as a prerequisite to the Work being accepted by Owner as substantially complete, the Owner must receive:

.1 all executed Roofing Contractor's and Roofing Manufacturer's guarantees, where roofing work is part of the Contract;

.2 written documentation from a consultant acceptable to the Owner and Architect that air and HVAC systems have been tested and balanced and are operating in compliance with specifications;

.3 to the extent applicable, written documentation from a consultant acceptable to the Owner and Architect that elevators have been inspected and tested and are operating in compliance with specifications; and

.4 any other requirements as a prerequisite to Substantial Completion under the Contract Documents.

Further, prior to Architect's inspection to determine Substantial Completion of the Work, the Contractor shall notify the Architect that the Project is ready for inspection by the State Fire Marshal's office and any other regulatory authorities having jurisdiction over the Project. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate.

When the Architect determines that the project or any portion thereof is Substantially Complete, he shall prepare a punch list of exceptions and the dollar value related thereto. The monetary value assigned to this list will be the sum of the cost estimate for each particular item of Work the Architect develops based on the mobilization, labor, material and equipment costs of correcting the item and shall be retained from the monies owed the contractor, above and beyond the standard retainage.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate.

§ 9.8.6 The Owner may issue a Notice of Acceptance of Building Contract which shall establish the date of Substantial Completion. The Contractor will record the Notice of Acceptance with the Recorder of Mortgages or the Clerk of Court in the Parish where the Project is located. If the Notice of Acceptance has not been recorded seven (7) days after issuance, the Owner may record the Notice of Acceptance at the Contractor's expense.

§ 9.8.7 Warranties required by the Contract Documents shall commence on the date of Acceptance of the Work unless otherwise agreed to in writing by the Owner and Contractor. Unless otherwise agreed to in writing by the Owner and Contractor, security, maintenance, heat, utilities, damage to the Work not covered by the punch list and insurance shall become the Owner's responsibility on the Date of Substantial Completion.

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§ 9.8.8 If all punch list items have not been completed by the end of the forty-five (45) day claim (lien) period, through no fault of the Architect or Owner, the Owner may declare the Contractor in default. If the Owner determines that the Contractor is in default, the surety shall be notified. If within forty-five (45) days after notification, the surety has not completed the punch list, through no fault of the Architect or Owner, the Owner may, at its option, enter into a contract or contracts to have the balance of the Work completed and pay for such Work with the unpaid funds remaining in the Contract Sum.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is authorized by public authorities having jurisdiction over the Project.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. If the Architect does not find the Work finally complete under the Contract Documents, the Architect shall make one additional inspection; if the Work is still not completed, the Architect, and each of the Architect's principal consultants, shall be paid **$250.00/hour** for their time at the Project site, for each additional inspection, which expense shall be withheld from the unpaid funds remaining in the Contract Sum. The payment shall be made by the Owner and deducted from the Contract Sum. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any retainage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner; and (7) a clear Lien and Privilege Certificate. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract

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Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those claims previously made in writing and identified by that payee as unsettled at the time of the final Application for Payment. The making of final payment shall not constitute a waiver of claims by the Owner for the following:

.1 claims, security interests, or encumbrances arising out of the Contract and unsettled;
.2 failure of the Work to comply with the requirements of the Contract Documents regardless of then such failure is discovered;
.3 terms of special warranties required by the Contract Documents; or
.4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Notwithstanding anything in the Contract or the Contract Documents to the contrary, before the Owner will make the final payment, including retainage, the Work must have been completed, the Contract fully performed and final payment recommended by the Architect, and the Contractor must have delivered to the Owner a clear Lien and Privilege Certificate from the Clerk of Court or the Recorder of Mortgages for the Parish in which the Project is located, showing that no statutory claims, liens, or privileges arising out of or in connection with the Contract appear on the public record against the Contract, Contractor, Owner, Work, Project or Property. The date of the clear Lien and Privilege Certificate must be at least 45 days after recordation of the Notice of Acceptance.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

.1 employees on the Work and other persons who may be affected thereby;
.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on the health and safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, at Contractor's sole cost and expense, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including providing traffic control personnel, posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards. The Contractor shall also be responsible, at the Contractor's sole cost and expense, for all measures necessary to protect any property adjacent to the Project Site and improvements thereon which could be affected by the performance of the Work. Any damage to such property or improvement arising out of the performance of the Work shall be promptly and adequately addressed and/or repaired by the Contractor at the Contractor's sole cost and expense.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

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§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), or lead, encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. The Contract Time shall be extended appropriately.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity. Notwithstanding the foregoing, Owner shall have no obligation to indemnify the Contractor or its Subcontractors for any materials or substances encountered at the site if said materials or substances were placed or deposited at or about the site by the Contractor, its Subcontractors, suppliers, materialmen, vendors or their employees or agents at any time during construction of, or during the Contractor's performance of the Work pursuant to the Contract Documents.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

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§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all documented direct cost and expense paid and/or payable to the applicable government agency.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall immediately notify the Owner and the Architect of the emergency, and the Contractor shall simultaneously act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Any additional compensation or an extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide separate performance and payment bonds each in the amount of the Contract Sum and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the

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Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.2.4 The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§11.4 Adjustment and Settlement of Insured Loss

§ 11.4.1 The Owner as fiduciary shall have power to adjust and settle a loss with insurers.

§ 11.4.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

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§ 11.4.3 Prior to commencement of the Work, the Contractor shall record the Contract Between Owner and Contractor and the Performance and Payment Bonds with the Recorder of Mortgages or the Clerk of Court of the Parish in which the Project is located.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5. If the Contractor fails to correct non-conforming Work, or Work covered by warranties, within a thirty (30) day period, through no fault of the Architect or Owner, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. If within thirty (30) days after notification, the Surety has not corrected the non-conforming or warranty Work through no fault of the Architect or Owner, the Owner may contract to have the non-conforming or warranty Work corrected and hold the Surety responsible for the cost including Architect's fees and other indirect costs. Corrections by the Owner shall be in accordance with Section 2.4. If the Surety fails to correct the non-conforming or warranty Work within the stipulated time period and fails to meet its obligation to pay the costs, the Owner may not accept bonds submitted, in the future, by the Surety.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

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§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of Louisiana.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Contractor shall not assign the Contract as a whole without written consent of the Owner. If Contractor attempts to make an assignment without such consent, Contractor shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.3 Rights and Remedies

§ 13.3.1 Except as expressly provided in the Contract Documents, duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.3.3 The judicial court in and for the Parish of Tangipahoa, State of Louisiana shall have sole jurisdiction and venue in any action brought under this Contract.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Unless otherwise agreed, the Owner will hire the testing entity and such costs will be paid by the Owner directly to the testing entity.

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§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction;

.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped; or

.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract.

§ 14.1.2 NOT USED.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply the necessary, properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;

.4 otherwise breaches any material provision of the Contract Documents; or.

.5 failure to complete the punch list within the lien period as provided in 9.8.8.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

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§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished. Termination by the Owner shall not suspend assessment of liquidated damages against the surety.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.2.5 If an agreed sum of liquidated damages has been established, termination by the Owner under this Article **14** will not relieve the Contractor and/or surety of their obligation under the liquidated damages provisions and the Contractor and/or surety shall be liable to the Owner for per diem liquidated damages.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 Upon termination by the Owner for convenience, the Contractor will recover as its sole remedy payment for that portion of the Work and Contractor's portion of overhead and profit thereon or Fee, properly performed prior to the effective date of termination and for items properly and timely fabricated off the Project site, delivered and stored in accordance with the Owner's instructions. The Contractor shall be paid for all reasonable costs required to secure the site, terminate Subcontracts and purchase orders (including restocking charges) and perform any other work necessary as determined by the Architect to effect the termination of the Contract. The Contractor shall not be entitled to be paid its anticipated profit or overhead on Work not performed prior to the termination. The Contractor hereby waives and forfeits all other claims for payment and damages, including, without limitation, anticipated profits. The Owner will be credited for:

.1 Payments previously made to the Contractor for portions of the Work previously performed; and

.2 The value for the materials, supplies, equipment, or other items that are to be retained by the Contractor, with acquiescence of Owner, and that are part of the Contract Sum.

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ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims: See LA R.S. 38:2189 & 38:2189.1.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and the Architect Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later , provided, however, that the Claimant shall use its best efforts to furnish the Architect and the other party, as expeditiously as possible, with notice of any Claim once such Claim is recognized, and shall cooperate with the Architect and the party against whom the Claim is made in an effort to mitigate the alleged or potential damages, delay or other adverse consequences arising out of the condition which is the cause of such Claim. A reservation of rights and similar stipulations shall not be recognized under the Contract as having any effect. A party must make a claim as defined herein within the time limits provided..

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Architect is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Architect's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, The Contractor shall document that weather conditions were abnormal for the period of time, and had an adverse effect on the critical path of the Project schedule. An increase in the Contract Time due to weather shall not be cause for an increase in the Contract Sum. At the end of each month, the Contractor shall make one claim for adverse weather days occurring within the month. The claim shall be accompanied by sufficient supporting documents evidencing the adverse weather days and the impact on the construction schedule. Failure to make any such claim within twenty-one (21) days from the last day of the month shall act as a waiver of any such claim for adverse weather days for that particular month.

15.1.6.3 The following are considered reasonably anticipated days of adverse weather on a monthly basis:

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January	11 days
February	10 days
March	8 days
April	7 days
May	5 days
June	6 days
July	6 days
August	5 days
September	4 days
October	3 days
November	5 days
December	8 days

The Contractor's request for an extension of time due to abnormal adverse weather conditions shall be considered only for those days which exceed the allowable number of days per month stated above. The Contract Time is computed on a calendar-day basis.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Architect for initial decision. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Architect, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Architect and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Architect will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Architect is unable to resolve the Claim if the Architect lacks sufficient information to evaluate the merits of the Claim or if the Architect concludes that, in the Architect's sole discretion, it would be inappropriate for the Architect to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Architect may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Architect in rendering a decision. The Architect may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Architect requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Architect when the response or supporting data will be furnished, or (3) advise the Architect that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Architect will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Architect will render an initial decision approving or rejecting the Claim, or indicating that the Architect is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to arbitration or litigation, whichever is applicable.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for

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mediation within 30 days after receipt thereof, then both parties waive their rights to mediate and can challenge the initial decision by arbitration or litigation, whichever is applicable.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of a complaint or demand for arbitration, whichever is appropriated, but, in such event, mediation shall proceed in advance of the court or arbitration proceeding, whichever is appropriate, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

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§ 15.4 Arbitration

§ 15.4.1 When appropriate, pursuant to the Agreement, if the Owner has selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, the Owner may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, the Owner may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

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North Oaks Health Parking Garage

15790 Paul Vega MD Dr

Hammond, LA 70403

Hospital Service District No. 1 of Tangipahoa Parish dba North Oaks Health

15790 Paul Vega MD Dr
Hammond, LA 70403

Washer Hill Lipscomb Cabaniss, LLC

1744 Oakdale Drive
Baton Rouge,
LA 70810

PAGE 15:

The terms knowledge, recognize and discover, their respective derivatives, and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows, recognizes, and discovers in exercising appropriately, and in accordance with industry standards, the care, skill, and diligence required by the Contract Documents. Analogously, the expression reasonably inferable and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a Contractor familiar with the Project and exercising the care, skill, and diligence required of the Contractor by the Contract Documents.

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. ~~The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.~~

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work ~~performed~~authorized by the Architect and the Architect's consultants under their respective

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professional services agreements and which are owned by the Owner. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor ~~and shall not be liable for results of interpretations or decisions rendered in good faith.~~

§ 1.1.9 KNOWLEDGE

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§ 1.1.10 PROVIDE

When the word "provide" including derivatives thereof is used, it shall mean to properly fabricate, transport, deliver, install, erect, construct, test and furnish all labor, materials, equipment, and related items necessary to complete the Work as required by the Contract Documents.

§ 1.1.11 PERSISTENT

The term "persistent" and other similar expressions, as used in reference to the Contractor, shall be interpreted to mean any combination of material acts and omissions, which causes the Owner or the Architect to reasonably conclude that the Contractor will not complete the Work within the Contract Time, for the Contract Sum or in substantial compliance with the requirements of the Contract Documents.

§ 1.2.4 In the event of inconsistencies within or between portions of the Contract Documents, the Contractor shall (1) provide the better quality or greater quantity of Work; or (2) comply with the more stringent requirements, either or both in accordance with the Architect's interpretation. The terms and conditions of this § 1.2.4, however, shall not relieve the Contractor of any of the obligations set forth in Paragraph 3.2, or any other provisions of the Contract Documents.

§ 1.2.4.1 In connection with the Drawings, specified dimensions shall take precedence over scaled measurements, and large-scale drawings take precedence over small scale drawings.

§ 1.2.4.2 Before ordering any materials or performing any Work, the Contractor and each Subcontractor shall verify measurements at the Project Site and shall be responsible for the correctness of such measurements. No additional compensation will be allowed on account of differences between actual dimensions and the dimensions indicated on the Drawings. Any difference between field measurements and dimensions set out in the Contract Documents shall be submitted to the Architect for resolution before proceeding with the Work.

§ 1.3 Capitalization

In the interest of brevity, the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

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~~§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change~~

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~~until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.~~

§ 1.5.1 The ~~Architect and the Architect's consultants~~Owner shall be deemed the ~~authors and owners~~owner of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the ~~Architect's or Architect's consultants'~~Owner's reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, ~~subject to any protocols established pursuant to Sections 1.7 and 1.8,~~ solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner~~, Architect, and the Architect's consultants~~.

~~§ 1.7 Digital Data Use and Transmission~~

~~The parties shall agree upon written protocols governing the transmission and use of, and reliance on, Instruments of Service or any other information or documentation in digital form.~~

~~§ 1.8 Building Information Models Use and Reliance~~

~~Any use of, or reliance on, all or a portion of a building information model without agreement to written protocols governing the use of, and reliance on, the information contained in the model shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.~~

~~§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.~~

~~§ 2.2 Evidence of the Owner's Financial Arrangements~~

~~§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.~~

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If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. ~~Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the~~The Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

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~~§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.~~

~~§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.~~

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor ~~to whom the Contractor has no reasonable objection and~~ whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. ~~The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.~~

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or ~~repeatedly~~persistently fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

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§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, ~~for differences between field measurements or conditions and the Contract Documents,~~ or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.1.2 The Contractor shall perform the Work in strict accordance with the Contract Documents.

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents. The Contractor and each Subcontractor have evaluated and satisfied themselves as to the conditions and limitations under which the Work is to be performed, including, without limitation (1) the location, condition, layout and nature of the Project site and surrounding areas; (2) the prevailing climatic conditions; (3) anticipated labor supply and costs; (4) availability and cost of materials, tools and equipment; and (5) other similar issues which in any way may affect the cost or time for performing the Work. The Owner assumes no responsibility or liability for the safety of the Project. The Contractor shall be solely responsible

~~§ 3.2.2~~ for providing a safe place for the performance of the Work. The Owner shall not be required to make any adjustments in either the Contract Sum or the Contract Time in connection with any failure by the Contractor or any Subcontractor to comply with the requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions

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related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents. The Contractor shall satisfy itself as to the accuracy of all grades, elevations, dimensions and locations. In all cases of interconnection of its Work with existing or other work, it shall verify at the site all dimensions relating to such existing or other work which is apparent from a reasonable inspection. Any errors due to the Contractor's failure to so verify all such grades, elevations, locations or dimensions shall be promptly rectified by the Contractor without any additional cost to the Owner or adjustment to the Contract Time.

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§ 3.4.2 ~~Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.~~

~~§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.~~ Contractor and its employees, officers, agents, representatives, and Subcontractors shall conduct themselves in an appropriate and professional manner, in accordance with the Owner's requirements, at all times while working on the Project. Any such individual who behaves in an inappropriate manner or who engages in the use of inappropriate language or conduct while on the Owner's property, as determined by the Owner, shall be removed from the Project at the Owner's request. Any such individual shall not be permitted to return to the Project site without the written permission of the Owner. The Owner shall not be responsible or liable to the Contractor or any Subcontractor for any additional costs, expenses, losses, claims or damages incurred by Contractor or its Subcontractor as a result of the removal of an individual from the Owner's property pursuant to this Section. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

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§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4~~7~~.

§ 3.6 Taxes The ~~Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.~~ State of Louisiana, through the Department of Revenue, requires contractors to pay Sales and Use Taxes on materials, supplies, fixtures and equipment and taxable services and leases and rentals of tangible personal property [collectively "tax exempt purchases"] which are used, consumed and/or incorporated into the construction of the Project. Under Louisiana law, the Owner is exempt from the payment of such taxes pursuant to a specific statute. In order for the Owner to benefit from its exempt status in connection with this Project, the Owner has elected to designate the Contractor, its Subcontractors and their Vendors or Suppliers as agents of the Owner for the tax exempt or Suppliers shall execute a form attached hereto as Exhibit 1 which designates them as the Owner's agent for the tax exempt purchases, subject to the specific terms and conditions set forth herein. The Contractor's bid shall include all labor, materials and equipment exclusive of sales or use taxes, except for those purchases which are less than $1,000. For purchases which are less than $1,000. Contractor and its Subcontractors and Vendors may either include in the bid all applicable taxes on such purchases or treat such purchases as tax exempt.

§ 3.7.1 ~~Unless otherwise provided~~ The Contractor shall include in the Contract ~~Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for~~Sum and secure, pay for, and, as soon as practicable, furnish the Owner with copies or certificates of all permits including, without limitation, all building permits as required by governmental authorities having jurisdiction over the Project, and fees, licenses, and inspections necessary for the proper execution and completion of the Work that are customarily

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secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. The Owner shall retain the right to secure and pay for any building permits, and such permits will not be included in the Contract Sum. The Contractor will cooperate with the Owner and assist as reasonably necessary in the permitting process.

#Contractor represents that it has investigated the site and is familiar with all known, apparent, or reasonably discoverable conditions, subsurface or otherwise, which will be encountered at the site, and that Contractor has taken those conditions into account in establishing the Contract Sum and the Contract Time, as well as all other conditions concerning the performance of the Work, including without limitation, underground and above ground utilities, work space restrictions, work-hour restrictions, noise restrictions, restrictions on site ingress and egress, weather conditions, ground water, dewatering requirements, temporary and permanent utilities relocation, ventilation requirements, and all other restrictions, demands, and requirements needed for the timely and adequate performance of the Work required by the Contract Documents, and all such conditions have been assumed by

Contractor and are reflected and incorporated into the Contract Sum and the Contract Time. Subject to the foregoing, if the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

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§ 3.8.3 Materials and equipment under ~~a~~and allowance shall be selected by the Owner with reasonable promptness.

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. For projects with a Contract Sum greater than $500,000.00, the Contractor shall include with the schedule, for the Owner's and Architect's information, network analysis (CPM) that identifies those tasks which are on the critical path, i.e. where any delay in the completion of these tasks will lengthen the Project's completion, unless appropriate action is taken. A revised and updated schedule shall be submitted with each Application and Certificate for Payment. The Owner shall not have any obligation to make payment for each Application for Payment until the revised and updated schedule is received by the Owner.

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§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule~~,~~ or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in ~~general~~ accordance with the most recent schedules submitted to the Owner and Architect.

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§ 3.10.4 In the event the Architect determines that the performance of the Work has not progressed or reached the level of completion required by the Contract Documents, the Owner, upon the recommendation of the Architect, shall have the right to order the Contractor to take corrective measures necessary to expedite the progress of the construction, including, without limitation, (1) working additional shifts or overtime, (2) supplying additional manpower, equipment, and facilities, and (3) other similar measures (hereinafter referred to as "Recovery Measures"). Such Recovery Measures shall continue until the progress of the Work achieves the stage of completion required by the Contract Documents. The Owner's right to require Recovery Measures is solely for the purpose of ensuring the Contractor's compliance with the construction schedule.

§ 3.10.4.1 The Contractor shall not be entitled to an adjustment in the Contract Sum in connection with Recovery Measures required by the Owner under or pursuant to this Paragraph 3.10.4, unless the Recovery Measures were directed by the Owner to recover from delays for which the Contractor was entitled to an extension of the Contract Time pursuant to the Contract Documents, and said extension of time was timely and properly requested by Contractor and improperly denied by Owner.

§ 3.10.4.2 The Owner may exercise the rights provided to the Owner under or pursuant to this Paragraph 3.10.4 as frequently as the Owner deems necessary to ensure that the Contractor's performance of the Work will comply with the completion date set forth in the Contract Documents.

§ 3.10.4.3 Submittal by the Contractor of a schedule or other documentation showing a completion date for the Work prior to the completion date stated in the Contract shall not impose any obligation or responsibility on the Owner or the Architect for the earlier completion date.

§ 3.10.4.4 In the event the Owner employs or contracts with a person or entity for commissioning services and/or quality assurance, the Contractor shall cooperate fully in the commissioning and/or quality assurance process and shall require all subcontractors and others under its control to cooperate.

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form ~~or paper copy~~acceptable to the Owner, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed. This requirement is essential to the contract. The Architect shall determine the value of these documents, and this amount shall not be approved for payment to the Contractor until all of the listed documents are delivered to the Architect in good order, completely marked with field changes and otherwise complete in all aspects.

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§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional and that professional shall comply with reasonable requirements of the Owner regarding qualifications and insurance. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner ~~and the Architect~~ shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the ~~Owner and~~ Architect ~~have specified to~~has provided the Contractor with the performance and design criteria that such services must satisfy.

Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the ~~limited~~ purpose of checking for conformance with information given and the ~~design concept expressed in the~~ Contract Documents.

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§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees and expenses and costs, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property ~~(other than the Work itself), but only to the extent~~, and caused by the negligent acts or omissions, or breach of contract of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable~~, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder~~. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.12.11 Except for mitigating lead times or pricing increases, the Contractor shall make every reasonable effort to timely order materials in a manner which minimizes the possibility of any return or restocking fees, shipping charges or any other related costs for such material.

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. The Contractor shall use its best efforts to minimize any interference with the occupancy or beneficial use of any of the Owner's areas and buildings adjacent to the site of the Work. Without prior approval of the Owner, the Contractor will not permit any workers to use any existing facilities at the Project site, including without limitations, lavatories, toilets, entrances and parking areas other than those designated for such use by the Owner.

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. If, upon one (1) business day's notice to Contractor by the Owner, that the construction site or surrounding area needs to be made free of litter, waste materials, debris, rubbish or other unsightly material, and the Contractor fails to promptly commence such clean-up, the Owner may commence with such clean-up and deduct the cost of such clean-up from the Contractor's subsequent Applications for Payment. All litter on the job site should be picked up and disposed of on a daily basis. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

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§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement. The term Architect, when used in the Contract Documents, shall mean the prime Designer (Architect, Engineer, or Landscape Architect), or his authorized representative, lawfully licensed to practice architecture, engineering, or landscape architecture in the State of Louisiana, identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment and, and with the concurrence of the Owner, the Architect will provide services from time to time during the one-year period for correction of the Work as described in Section 12.2. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at least weekly, and at intervals appropriate to the stage of construction, ~~or as otherwise agreed with the Owner, to become generally familiar with~~to become generally familiar with and to keep the Owner informed about the progress and quality of the ~~portion of the~~ Work completed, and to determine in general if the Work ~~observed~~ is being performed in ~~a manner indicating that the Work, when fully completed, will be in~~ accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work~~, since these are solely the Contractor's rights and responsibilities under the Contract Documents~~.

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§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work ~~completed,~~ and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not ~~be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not~~ have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

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§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due to the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, ~~but only~~ for the ~~limited~~ purpose of checking for conformance with information given and the ~~design concept expressed in the~~ Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. ~~Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents.~~ The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives. There will be no restriction on the Owner having a representative.

§ 4.2.13 ~~The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents~~NOT USED.

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§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, ~~as soon as practicable after award of the Contract~~at the pre-construction conference, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

~~§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.~~ Owner reserves the right to approve or disapprove, at its sole discretion, of any Subcontractor or supplier proposed by Contractor. No payments will be due and payable to the Contractor until the Contractor submits the information required in this Section.

§ 5.2.~~3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before~~

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~~commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.~~2 The Contractor shall be solely responsible for selection and performance of all Subcontractors and suppliers. The Contractor shall not be entitled to an increase in the Contract Time or the Contract Sum due to a problem with performance or non-performance of a Subcontractor or supplier, or the additional cost incurred by Contractor in replacing a Subcontractor who has been rejected by Owner and Architect for cause pursuant to this Section. The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. However, Contractor shall not select or utilize any Subcontractor who has been placed in default, and/or has been terminated, and/or has abandoned the Work on any previous project.

§ 5.2.3 The Contractor shall notify the Owner in writing when a Subcontractor is to be replaced and substituted with another Subcontractor.

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. ~~Where appropriate, the~~The Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

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§ 5.4.2 Upon such assignment~~, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.~~

~~§ 5.4.3 Upon assignment~~ to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the ~~subcontract~~Subcontract to a successor contractor or other entity, the Owner shall ~~nevertheless remain~~not be legally responsible for all of the successor contractor's obligations under the ~~subcontract.~~Subcontract.

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§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work. Except as permitted in Section 7.3 and Paragraph 9.7.2, a change in the Contract Sum or the Contract Time may be accomplished only by Change Order or by a Construction Change Directive signed by the Owner's representative. Accordingly, no course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work and no claim that Owner has been unjustly enriched by any alteration of or addition to the Work, whether or not there is, in fact, any unjust enrichment to the Owner, shall be the basis of any claim for an increase in the amount due under the Contract Documents or a change in the Contract Time or any time period provided for in the Contract Documents.

§ 7.1.4 Atthe pre-construction conference, the Contractor is to provide the following submittals:

.1 Fixed job site overhead cost itemized with documentation to support daily rates;

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.2 Bond premium rate with supporting information from the General Contractor's surety;

.3 Labor burden by trade for Contractor and its Subcontractors. The labor burden shall be supported and documented by providing Worker's Compensation and Employer's Liability Insurance Policy Information Page and any other costs that comprise the Labor burden;

.4 Internal rate charges for all significant company-owned equipment;

.5 A designation of the Work to be performed with the Contractor's own forces;

.6 A list of names and addresses of all Subcontractors (of any tier), suppliers, manufacturers or other persons or entities (including those who are to furnish materials or equipment fabricated to a special design) which are proposed for any portion of the Work. Contractor and its Subcontractors are encouraged to consider purchasing materials, equipment and supplies through Premier Purchasing Partners, L.P., a group purchasing organization from whom the Owner regularly purchases materials, equipment and supplies in connection with their operations. Should the identity of any such suppliers, manufacturers or other persons or entities not be available on the date of the pre-construction conference, Contractor shall provide the names and addresses of any such persons or entities at least thirty days before the purchase of any materials, equipment and supplies by such persons or entities;

.7 A breakdown of the Cost of the Work by line item to be set forth in the Schedule of Values.

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§ 7.1.5 If the Contractor fails to submit the required submittals in 7.1.4, the Owner shall not have any obligation to make payments to the Contractor in connection with any Application for Payment until such time when Owner receives such submittals.

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, the Architect, and the Contractor~~, and Architect stating their agreement upon all of the following~~ issued after execution of the Contract, authorizing a change in the Work and/or an adjustment in the Contract Sum and/or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates his agreement therewith, including the adjustment in the Contract Sum or the Contract Time. Any reservation of rights, stipulation, or other modification made on the Change Order by the Contractor shall have no effect.

§ 7.2.2 "Cost of the Work" for the purpose of Change Orders shall be the eligible costs required to be incurred in performance of the Work and paid by the Contractor and Subcontractors. Eligible costs shall be limited to:

.1 Actual wages paid directly to labor personnel, with a labor burden markup exclusively limited to applicable payroll taxes, worker's compensation insurance, unemployment compensation, and social security taxes for those labor personnel performing the Work. Wages shall be the basic hourly labor rate paid to an employee exclusive of fringe benefits or other employee costs. The labor burden percentage for the "Cost of the Work" is limited to categories listed herein;

.2 Cost of all materials and supplies, including the identification of each item and its cost including taxes;

.3 Actual documented, paid rental costs to third parties for each necessary piece of machinery and equipment required to perform the Work, identifying each item and its individual cost, excluding taxes;

.4 Bond costs: Bond premiums may be included where the documented cost of the premiums has been increased due to the Change Order, but only after the markup is added to the Cost of the Work. Contractor shall provide Owner with documentary proof of such increases in premiums.

§ 7.2.3 "Overhead and Profit": Contractor and Subcontractor shall be due job-site and home office fixed overhead and profits on the Cost of the Work for the purposes of Change Orders, but the combined total of such overhead and profit payable by Owner shall not exceed a total of 16% of the direct cost of any portion of the Work, regardless of the number or tiers of Subcontract work, as specifically set out in §7.2.4.

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For a CMAR project, the combined total of such overhead and profit payable by Owner shall not exceed a total of the agreed upon CMAR fee percentage + 8% of the direct cost of any portion of the Work, regardless of the number or tiers of Subcontract work, as specifically set out in §7.2.4.

The credit to the Owner resulting from a change in the Work shall be the sum of those items above, including overhead and profit. Where a change results in both credits to the Owner and extras to the Contractor for related items, overhead and profit shall be computed for credits to the Owner and extras to the Contractor. The Owner shall receive full credit for the computed overhead and profit on credit change order items.

§ 7.2.4 The cost to the Owner resulting from a change in the Work shall be the sum of "Cost of the Work" (as defined at 7.2.2 and 7.2.8) and "Overhead and Profit" with the Overhead and Profit computed as follows:

.1 When all of the work is General Contract work; the agreed upon CMAR fee percentage if for a CMAR project (as referenced in Section 7.2.3) or otherwise 8% markup on the Cost of the Work.

.2 When the work is all Subcontract work; 8% markup on the Cost of the Work for Subcontractor's Overhead and Profit, plus the agreed upon CMAR fee percentage (if for a CMAR project as referenced in Section 7.2.3) or otherwise 8% markup by the General Contractor on the Subcontractor's Cost of the Work but not on the Subcontractor's Overhead and Profit.

.3 When the work is a combination of General Contract work and Subcontract work; that portion of the direct cost that is General Contract work shall be computed per 7.2.4.1 and that portion of the direct cost that is Subcontract work shall be computed per 7.2.4.2.

Bonds premiums may be included, but after the markup is added to the Cost of the Work. Premiums for the Subcontractor's Bond shall not be included.

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§ 7.2.4.4 Subcontract cost shall consist of the items in 7.2.2 above plus Overhead and Profit as defined in 7.2.3.

§ 7.2.5 Before a Change Order is prepared, the Contractor shall provide and deliver to the Architect and Owner the following information concerning the Cost of the Work, not subject to waiver, within a reasonable time after being notified to prepare said Change Order:

~~.1 The change in the Work~~

.1 Detailed itemized list of labor, material and equipment costs for the General Contractor's work including quantities and unit costs for each item of labor, material and equipment; and

.2 An itemized list of labor, material and equipment costs for each Subcontractor's and/or Sub-Subcontractor's work including quantities and unit costs for each item of labor, material and equipment.

.3 The Contractor shall provide supporting documentation as may be requested by the Architect or Owner for any Cost of the Work to be included in a Change Order.

§ 7.2.6 After a Change Order has been approved, no future requests for extensions of time or additional cost shall be considered nor recoverable for that Change Order work.

§ 7.2.7 Extended fixed job-site costs are indirect costs that are necessary to support the work in the field. Examples of fixed job-site costs are field office rental, salaries of field office staff, field office utilities and telephone.

Extended fixed job-site costs or equitable adjustment may be included in a Change Order due to a delay in the critical path, with the exception of weather-related delays. In the event of a delay in the critical path, the Contractor shall submit all

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changes or adjustments to the Contract Time within twenty-one (21) days of the event giving rise to the delay. The Contractor shall submit documentation and justification for the adjustment by performing a critical path analysis of its most recent schedule in use prior to the change, which shows an extension in critical path activities.

The Contractor shall notify the Architect and the Owner in writing that the Contractor is making a claim for extended fixed jobsite overhead as required by Section 15.1.2. The Contractor shall provide proof that the Contractor is unable to mitigate financial damages through Replacement Work within this Contract or replacement work. "Replacement Work" is that work which the Contractor is obligated to perform under any construction contract separate from this Contract. Reasonable proof shall be required by the Architect that the delays affected the Completion Date.

§ 7.2.8 Cost of the Work, whether General Contractor cost or Subcontractor cost, shall not include any of the following:

.1 Salaries or other compensation of the Contractor's personnel at the Contractor's principal office and branch offices;

.2~~The amount~~ Any part of the ~~adjustment, if any, in the Contract Sum~~Contractor's capital expenses, including interest on the Contractor's capital employed for the Work;

.3 Overhead and general expenses of any kind or the cost of any item not specifically and expressly included above in Cost of the Work, including but not limited to, administrative time or costs related to preparing or processing Change Orders or CCDs or obtaining pricing, quotes, proposals or estimates;

.4 Cost of supervision not specifically required by the Change Order;

.5 That portion of the cost of labor burden which includes fringe benefits, company-issued bonuses, health insurance and any other cost or benefit which is not specifically and expressly included as a Cost of the Work identified in Section 7.2.2;

.6 Any other costs not allowed by provisions included in Section 7.9 of the AIA A133 Agreement if applicable;

.7 Overhead and profit on rental of equipment and/or any costs related to incidental small tools of a specific trade (i.e., shovels, saws, hammers, ladders, air compressors, etc.);

.8 Charges related to vehicles, whether for general use or specialized trade use, including but not limited to, for moving items around the site, mileage, trip charges or fuel;

.9 Any costs of travel, lodging, and/or meals are not eligible and shall not be included. For the avoidance of doubt, labor shall not be included for travel time nor shall mileage, fuel or incidentals for travel from "out of town";

.10 Unless approved in advance by the Owner, no overtime rates shall be included; Regardless of the Contractor or trade working a compressed work week, including but not limited to, a 4-day,10-hour shift schedule, the Owner will not be charged overtime for any hours which fall on a weekday.

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.11 Commercial General Liability, Automobile Liability, and all other required insurances, where referenced in the Contract shall be considered part of normal overhead. These costs are already compensated by the Overhead and Profit markup;

.12 Any costs related to software or the use thereof, including but not limited to BIM;

.13 Incidental consumables are not eligible costs and shall not be included; and

.3~~The extent of the adjustment, if any, in the Contract Time~~14 Overhead and profit on transportation, freight, fuel surcharges, restocking fees, delivery or any other fees or related charges.

§ 7.2.9 When applicable as provided by the Contract, the cost to Owner for Change Orders shall be determined by

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quantities and unit prices. The quantity of any item shall be as submitted by the Contractor and approved by the Architect. Unit prices shall cover cost of Material, Labor, Equipment, Overhead and Profit.

§ 7.2.10 Each Change Order which adds an amount of ten (10%) per cent or more of the original Contract Sum and which additional amount is at least $10,000.00, or all Change Orders to the Contract which in the aggregate have a value of twenty (20%) per cent or more of the original Contract Sum and which additional amount is at least $10,000.00, shall be filed by the Contractor for recordation with the Clerk of Court for the Parish of Tangipahoa, State of Louisiana.

.3 Cost to be determined in a reasonable manner ~~agreed upon by the parties and a mutually acceptable fixed or percentage fee~~acceptable to the Owner and calculated in accordance with §7.2, but not to exceed a specified amount; or

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in ~~the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount.~~ §7.2 of these General Conditions. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the ~~following:~~

~~.1Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;~~

~~.2Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;~~

~~.3Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;~~

~~.4Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and~~

~~.5 Costs of supervision and field office personnel directly attributable to the change.~~

~~§ 7.3.5~~ allowable costs under Section 7.2.

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§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work. The Contractor agrees to commence work not later than fourteen (14) days after the transmittal date of a written notice to proceed from the Owner and to substantially complete the Project within the Contract Time. The Owner will suffer financial loss if the Project is not substantially complete in the time set forth in the Contract Documents. The Contractor and the Contractor's surety shall be liable for and shall pay to the Owner the sum stated in the Contract Documents as fixed, agreed upon liquidated damages for each consecutive calendar day (Saturdays, Sundays, and holidays included) of delay until the Work is substantially complete. Such Liquidated Damages shall be withheld by the Owner from the amounts due to the Contractor for progress and/or final payments.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order. Any reservation of rights, stipulation, or other modification made on the Construction Change Directive by the Contractor shall have no effect.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost including overhead and profit in accordance with Sections 7.2.3 and

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7.2.4 and as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase or net decrease, if any, with respect to that change.

The Architect ~~may~~has authority, with the approval of the Owner, to order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

§ 8.1.5 The Contract Time shall not be changed by the Contractor's submission of a schedule which shows a completion date earlier than the Contract completion date, unless specifically authorized by Change Order.

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§ 9.3.1 ~~At least ten days before the date established for each progress payment~~ Monthly, the Contractor shall submit to the Architect an ~~itemized~~ Application and Certificate for Payment ~~prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all~~on the AIA Document G702-1992, accompanied by AIA Document G703 -1992, and supported by any additional data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents. Once the Schedule of Values is submitted at the Pre-Construction Conference, the Schedule shall not be changed or modified without approval from the Owner and Architect. An Application for Payment shall be submitted on or about the first of each month for the value of labor and materials incorporated into the Work and of materials, suitably stored, at the site as of the twenty-fifth day of the preceding month, less normal retainage, per La. R.S. 38:2248 as set out below

§ 8.2.2 ~~The Contractor shall not knowingly, except~~ Except by agreement or instruction of the Owner in writing, the Contractor shall not commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by ~~labor disputes~~, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may ~~determine~~ recommend, subject to Owner's approval. If the claim is not made within the time limits set out in Article 15, all rights for future claims for that month are waived.

§ 8.3.4 If the Contractor submits a schedule or a progress report indicating, or which otherwise expresses an intention to achieve, completion of the Work prior to any completion date required by the Contract Documents or the expiration of the Contract Time, the Owner will not be liable to the Contractor for any failure of the Contractor to so complete the Work by such date or time.

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a detailed schedule of values to the Owner and Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Owner and Architect. This schedule, unless objected to by the Owner or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values ~~shall~~must be ~~submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment~~ pre-approved in writing by the Owner and Architect.

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§ 9.3.1.1 ~~As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.~~ Retainage to be withheld on projects with a Contract Sum up to $500,000.00 shall be 10% of the Contract Sum.

§ 9.3.1.2 Retainage to be withheld on projects with a Contract Sum of $500,000.00 or more shall be 5% of the Contract Sum.

§ 9.3.1.~~2 Applications~~3 Each Application for Payment shall ~~not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay~~be accompanied by the following, all in the form and substance satisfactory to the Owner:

.1 A current Contractor's claim and lien waiver duly executed and an acknowledged sworn statement showing that all Subcontractors and materialmen with whom the Contractor has entered into subcontracts or purchase orders, the amount of each such Subcontract or purchase order, the amount requested for any Subcontractor and materialmen and the requested progress payment and the amount to be paid to the Contractor for such progress payment, together with similar sworn statements from all such Subcontractors and materialmen;

.2 Duly executed waivers of mechanics' and materialmen's claims and liens from all Subcontractors and, when appropriate, from materialmen and lower tier Subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or persons in any previous Application for Payment; and

.3 All information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner or the Architect.

.4 Current revised and updated Project schedule.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. ~~If approved in advance by the Owner, payment may similarly be made~~ Payments for materials ~~and~~or equipment ~~suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment~~ stored on or off the site shall be conditioned upon ~~compliance~~submission by the Contractor ~~with~~of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, ~~and shall include the costs of~~including applicable insurance~~, storage, and transportation to the site, for such materials and equipment stored off the site.~~

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§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner. La. R.S. 9:2784 (A) and (C) requires a Contractor or Subcontractor to make payment due to each Subcontractor and supplier within fourteen (14) consecutive days of the receipt of payment from the Owner. If not paid, a penalty in the amount of ½ of 1% per days is due, up to a maximum of 15% from the expiration date until paid. The Contractor or Subcontractor, whichever is applicable, is solely responsible for payment of any such penalty.

.7 ~~repeated~~ persistent failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue

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joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect, and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment ~~into~~ the ~~manner and~~Contractor within ~~the time provided in the Contract Documents, and shall so notify the Architect~~ thirty (30) days after receipt of such Certificate of Payment.

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§ 9.7.2 If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to this Contract or the Contract Documents, that payment will be made promptly upon demand by the Owner. Notwithstanding anything contained in this Contract or the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or if the Owner incurs any costs and expenses recoverable under applicable laws to cure any default of the Contractor in performance of the Work, or to correct defective Work, the Owner will have an absolute right to offset that amount against the Contract Sum and may, in the Owner's sole discretion, elect either to:

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law. Pursuant to La. R.S. 38:2242, when the Owner receives any claim for nonpayment arising out of the Contract, the Owner shall deduct 125% of such claim from the Contract Sum. The Contractor, or any interested party, may deposit security, in accordance with La. R.S. 38:2242.2, guaranteeing payment of the claim with the Recorder of Mortgages or the Clerk of Court of the Parish where the Project is located. When the Owner receives original proof of such guarantee from the Recorder of Mortgages or the Clerk of Court, the claim deduction will be added back to the Contract Sum.

§ 9.7.1 If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven (7) days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within ~~seven~~ twenty (20) days after the date established in the Contract Documents~~,~~ the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon ~~seven~~ fourteen (14) additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of ~~shutdown~~shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

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§ 9.8.6 The Owner may issue a Notice of Acceptance of Building Contract which shall establish the date of Substantial Completion. The Contractor will record the Notice of Acceptance with the Recorder of Mortgages or the Clerk of Court in the Parish where the Project is located. If the Notice of Acceptance has not been recorded seven (7) days after issuance, the Owner may record the Notice of Acceptance at the Contractor's expense.

.1 Deduct an amount equal to that which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner; or

.2 Issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use and the Owner has received a Certificate of Occupancy from regulatory authorities having jurisdiction over the Project.

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§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. When applicable, as a prerequisite to the Work being accepted by Owner as substantially complete, the Owner must receive:

.1 all executed Roofing Contractor's and Roofing Manufacturer's guarantees, where roofing work is part of the Contract;

.2 written documentation from a consultant acceptable to the Owner and Architect that air and HVAC systems have been tested and balanced and are operating in compliance with specifications;

.3 to the extent applicable, written documentation from a consultant acceptable to the Owner and Architect that elevators have been inspected and tested and are operating in compliance with specifications; and

.4 any other requirements as a prerequisite to Substantial Completion under the Contract Documents.

Further, prior to Architect's inspection to determine Substantial Completion of the Work, the Contractor shall notify the Architect that the Project is ready for inspection by the State Fire Marshal's office and any other regulatory authorities having jurisdiction over the Project. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. ~~Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion~~

When the Architect determines that the project or any portion thereof is Substantially Complete, he shall prepare a punch list of exceptions and the dollar value related thereto. The monetary value assigned to this list will be the sum of the cost estimate for each particular item of Work the Architect develops based on the mobilization, labor, material and equipment costs of correcting the item and shall be retained from the monies owed the contractor, above and beyond the standard retainage.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. ~~Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents~~

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§ 9.8.7 Warranties required by the Contract Documents shall commence on the date of Acceptance of the

Work unless otherwise agreed to in writing by the Owner and Contractor. Unless otherwise agreed to in writing by the Owner and Contractor, security, maintenance, heat, utilities, damage to the Work not covered by the punch list and insurance shall become the Owner's responsibility on the Date of Substantial Completion.

§ 9.10.2 Neither final payment nor any ~~remaining retained percentage~~retainage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of

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surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, ~~and~~ (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner; and (7) a clear Lien and Privilege Certificate. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.8.8 If all punch list items have not been completed by the end of the forty-five (45) day claim (lien) period, through no fault of the Architect or Owner, the Owner may declare the Contractor in default. If the Owner determines that the Contractor is in default, the surety shall be notified. If within forty-five (45) days after notification, the surety has not completed the punch list, through no fault of the Architect or Owner, the Owner may, at its option, enter into a contract or contracts to have the balance of the Work completed and pay for such Work with the unpaid funds remaining in the Contract Sum.

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is ~~consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.~~ authorized by public authorities having jurisdiction over the Project.

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. If the Architect does not find the Work finally complete under the Contract Documents, the Architect shall make one additional inspection; if the Work is still not completed, the Architect, and each of the Architect's principal consultants, shall be paid $250.00/hour for their time at the Project site, for each additional inspection, which expense shall be withheld from the unpaid funds remaining in the Contract Sum. The payment shall be made by the Owner and deducted from the Contract Sum. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

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§ 9.10.4 ~~The making of final payment shall constitute a waiver of Claims by the Owner except those arising from~~ Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those claims previously made in writing and identified by that payee as unsettled at the time of the final Application for Payment. The making of final payment shall not constitute a waiver of claims by the Owner for the following:

.1 ~~liens, Claims~~ claims, security interests, or encumbrances arising out of the Contract and unsettled;

.2 failure of the Work to comply with the requirements of the Contract Documents regardless of then such failure is discovered;

§ 9.10.5 ~~Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims~~

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~~by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.~~ Notwithstanding anything in the Contract or the Contract Documents to the contrary, before the Owner will make the final payment, including retainage, the Work must have been completed, the Contract fully performed and final payment recommended by the Architect, and the Contractor must have delivered to the Owner a clear Lien and Privilege Certificate from the Clerk of Court or the Recorder of Mortgages for the Parish in which the Project is located, showing that no statutory claims, liens, or privileges arising out of or in connection with the Contract appear on the public record against the Contract, Contractor, Owner, Work, Project or Property. The date of the clear Lien and Privilege Certificate must be at least 45 days after recordation of the Notice of Acceptance.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on the health and safety of persons or property or their protection from damage, injury, or loss.

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§ 10.2.3 The Contractor shall implement, erect, and maintain, at Contractor's sole cost and expense, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including providing traffic control personnel, posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards. The Contractor shall also be responsible, at the Contractor's sole cost and expense, for all measures necessary to protect any property adjacent to the Project Site and improvements thereon which could be affected by the performance of the Work. Any damage to such property or improvement arising out of the performance of the Work shall be promptly and adequately addressed and/or repaired by the Contractor at the Contractor's sole cost and expense.

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), or lead, encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. ~~Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start up~~The Contract Time shall be extended appropriately.

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§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

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Notwithstanding the foregoing, Owner shall have no obligation to indemnify the Contractor or its Subcontractors for any materials or substances encountered at the site if said materials or substances were placed or deposited at or about the site by the Contractor, its Subcontractors, suppliers, materialmen, vendors or their employees or agents at any time during construction of, or during the Contractor's

performance of the Work pursuant to the Contract Documents.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all documented direct cost and expense ~~thereby incurred~~paid and/or payable to the applicable government agency.

In an emergency affecting safety of persons or property, the Contractor shall immediately notify the Owner and the Architect of the emergency, and the Contractor shall simultaneously act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. ~~Additional~~Any additional compensation or an extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

§ 11.1.2 The Contractor shall provide ~~surety~~separate performance and payment bonds ~~of~~each in the ~~types, for such penal sums,~~amount of the Contract Sum and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

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~~§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.~~

§ 11.2.4 The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement ~~or other property insurance applicable to the Project,~~ except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

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~~§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance~~

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~~The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.~~

~~§11.5~~§11.4 Adjustment and Settlement of Insured Loss

§ 12.2 2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5. If the Contractor fails to correct non-conforming Work, or Work covered by warranties, within a thirty (30) day period, through no fault of the Architect or Owner, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. If within thirty (30) days after notification, the Surety has not corrected the non-conforming or warranty Work through no fault of the Architect or Owner, the Owner may contract to have the non-conforming or warranty Work corrected and hold the Surety responsible for the cost including Architect's fees and other indirect costs. Corrections by the Owner shall be in accordance with Section 2.4. If the Surety fails to correct the non-conforming or warranty Work within the stipulated time period and fails to meet its obligation to pay the costs, the Owner may not accept bonds submitted, in the future, by the Surety.

§ 11.~~5~~4.1 ~~A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.~~ The Owner as fiduciary shall have power to adjust and settle a loss with insurers.

§ 11.~~5~~4.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

§ 11.4.3 Prior to commencement of the Work, the Contractor shall record the Contract Between Owner and Contractor and the Performance and Payment Bonds with the Recorder of Mortgages or the Clerk of Court of the Parish in which the Project is located.

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The Contract shall be governed by the law of ~~the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4~~ Louisiana.

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§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. ~~Except as provided in Section 13.2.2, neither party to the Contract shall~~Contractor shall not assign the Contract as a whole without written consent of the ~~other~~Owner. If ~~either party~~Contractor attempts to make an assignment without such consent, ~~that party~~Contractor shall nevertheless remain legally responsible for all obligations under the Contract.

~~§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.~~

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§ 13.3.1 ~~Duties~~ Except as expressly provided in the Contract Documents, duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.3 The judicial court in and for the Parish of Tangipahoa, State of Louisiana shall have sole jurisdiction and venue in any action brought under this Contract.

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. ~~The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.~~

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. ~~Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense~~Unless otherwise agreed, the Owner will hire the testing entity and such costs will be paid by the Owner directly to the testing entity.

~~§ 13.5 Interest~~

~~Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.~~

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of ~~30~~60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction ~~that requires all Work to be stopped;~~

.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped; or

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.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for

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withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract ~~Documents; or~~

~~.4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.~~

§ 14.1.2 ~~The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365 day period, whichever is less.~~ NOT USED.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed~~, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.~~

~~§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.~~

.1 repeatedly refuses or fails to supply ~~enough~~the necessary, properly skilled workers or proper materials;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; ~~or~~

.4 otherwise ~~is guilty of substantial breach of a provision of the Contract Documents~~breaches any material provision of the Contract Documents; or

.5 failure to complete the punch list within the lien period as provided in 9.8.8.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished. Termination by the Owner shall not suspend assessment of liquidated damages against the surety.

§ 14.2.5 If an agreed sum of liquidated damages has been established, termination by the Owner under this Article 14 will not relieve the Contractor and/or surety of their obligation under the liquidated damages provisions and the Contractor and/or surety shall be liable to the Owner for per diem liquidated damages.

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§ 14.4.3 ~~In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed, costs incurred by reason of the termination, including costs attributable to termination of Subcontracts, and the termination fee, if any, set forth in the Agreement.~~ Upon termination by the Owner for convenience, the Contractor will recover as its sole remedy payment for that portion of the Work and Contractor's portion of overhead and profit thereon or Fee, properly performed prior to the effective date of termination and for items properly and timely fabricated off the Project site, delivered and stored in accordance with the Owner's instructions. The Contractor shall be paid for all reasonable costs required to secure the site, terminate Subcontracts and purchase orders (including restocking charges) and perform any other work necessary as determined by the Architect to effect the termination of the Contract. The Contractor shall not be entitled to be paid its anticipated profit or overhead on Work not performed prior to the termination. The Contractor hereby waives and forfeits all other claims for payment and damages, including, without limitation, anticipated profits. The Owner will be credited for:

.1 Payments previously made to the Contractor for portions of the Work previously performed; and

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.2 The value for the materials, supplies, equipment, or other items that are to be retained by the Contractor, with acquiescence of Owner, and that are part of the Contract Sum.

~~The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2~~. See LA R.S. 38:2189 & 38:2189.1

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§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and ~~to the Initial Decision Maker with a copy sent to~~ the Architect~~, if the Architect is not serving as the Initial Decision Maker.~~ Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later, provided, however, that the Claimant shall use its best efforts to furnish the Architect and the other party, as expeditiously as possible, with notice of any Claim once such Claim is recognized, and shall cooperate with the Architect and the party against whom the Claim is made in an effort to mitigate the alleged or potential damages, delay or other adverse consequences arising out of the condition which is the cause of such Claim. A reservation of rights and similar stipulations shall not be recognized under the Contract as having any effect. A party must make a claim as defined herein within the time limits provided.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the ~~Initial Decision Maker~~Architect is required.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the ~~Initial Decision Maker's~~Architect's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment~~ in accordance with the decision of the Initial Decision Maker~~.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, ~~such Claim~~The Contractor shall ~~be documented by data substantiating~~document that weather conditions were abnormal for the period of time, ~~could not have been reasonably anticipated,~~ and had an adverse effect on the ~~scheduled construction.~~

~~§ 15.1.7 Waiver of Claims for Consequential Damages~~

~~The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes~~

~~.1damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and~~

~~.2damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.~~

~~This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents~~critical path of the Project schedule. An increase in the Contract Time due to weather shall not be cause for an increase in the Contract Sum. At the end of each month, the Contractor shall make one claim for adverse weather days occurring within the month. The claim shall be accompanied by sufficient supporting documents evidencing the adverse weather days and the impact on the construction schedule. Failure to make any such claim within twenty-one (21) days from the last day of the month shall act as a waiver of any such claim for adverse weather days for that particular month.

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15.1.6.3 The following are considered reasonably anticipated days of adverse weather on a monthly basis:

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January	11 days
February	10 days
March	8 days
April	7 days
May	5 days
June	6 days
July	6 days
August	5 days
September	4 days
October	3 days
November	5 days
December	8 days

The Contractor's request for an extension of time due to abnormal adverse weather conditions shall be considered only for those days which exceed the allowable number of days per month stated above. The Contract Time is computed on a calendar-day basis.

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the ~~Initial Decision Maker~~Architect for initial decision. ~~The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement.~~ Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the ~~Initial Decision Maker~~Architect, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the ~~Initial Decision Maker~~Architect and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The ~~Initial Decision Maker~~Architect will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the ~~Initial Decision Maker~~Architect is unable to resolve the Claim if the ~~Initial Decision Maker~~Architect lacks sufficient information to evaluate the merits of the Claim or if the ~~Initial Decision Maker~~Architect concludes that, in the ~~Initial Decision Maker's~~Architect's sole discretion, it would be inappropriate for the ~~Initial Decision Maker~~Architect to resolve the Claim.

§ 15.2.3 In evaluating Claims, the ~~Initial Decision Maker~~Architect may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the ~~Initial Decision Maker~~Architect in rendering a decision. The ~~Initial Decision Maker~~Architect may request the Owner to authorize retention of such persons at the Owner's expense.

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§ 15.2.4 If the ~~Initial Decision Maker~~Architect requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the ~~Initial Decision Maker~~Architect when the response or supporting data will be furnished, or (3) advise the ~~Initial Decision Maker~~Architect that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the ~~Initial Decision Maker~~Architect will either reject or approve the Claim in whole or in part.

§ 15.2.5 The ~~Initial Decision Maker~~Architect will render an initial decision approving or rejecting the Claim, or indicating that the ~~Initial Decision Maker~~Architect is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties ~~and the Architect, if the Architect is not serving as the Initial Decision Maker,~~ of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to ~~binding dispute resolution~~ arbitration or litigation, whichever is applicable.

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§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate ~~or pursue binding dispute resolution proceedings with respect to the initial decision.~~ and can challenge the initial decision by arbitration or litigation, whichever is applicable.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of ~~binding dispute resolution proceedings~~a complaint or demand for arbitration, whichever is appropriated, but, in such event, mediation shall proceed in advance of ~~binding dispute resolution proceedings~~the court or arbitration proceeding, whichever is appropriate, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

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§ 15.4.1 ~~If the parties have~~ When appropriate, pursuant to the Agreement, if the Owner has selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, ~~either party~~the Owner may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, ~~either party~~the Owner may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to

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arbitration of any claim, dispute or other matter in question not described in the written consent.

~~§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.~~

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Certification of Document's Authenticity

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I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 14:02:13 CDT on 08/28/2026 under Order No. 20250144530 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ - 2017, General Conditions of the Contract for Construction, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

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AIA® Document A101® – 2017

Standard Form of Agreement Between Owner and Contractor *where the basis of payment is a Stipulated Sum*

AGREEMENT made as of the day of in the year 2026
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

Hospital Service District No. 1 of Tangipahoa Parish dba North Oaks Health
15790 Paul Vega MD Dr
Hammond, LA 70403

and the Contractor:
(Name, legal status, address and other information)

for the following Project:
(Name, location and detailed description)

North Oaks Health Parking Garage
15790 Paul Vega MD Dr
Hammond, LA 70403

The Architect:
(Name, legal status, address and other information)

Washer Hill Lipscomb Cabaniss, LLC
1744 Oakdale Drive
Baton Rouge, LA 70810
(225) 620-7703

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document may have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101®–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract Documents represent the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[ ] The date of this Agreement.

[ ] A date set forth in a notice to proceed issued by the Owner.

[X] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

The date of commencement of the Work will be established in a written Notice to Proceed issued by the Owner.

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If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

[X] Not later than Three Hundred (300) calendar days from the date of commencement of the Work for the Base Bid.

[X] Not later than Three Hundred and Forty-Five (345) calendar days from the date of commencement of the Work for Alternate No. 1.

[X] Not later than Three Hundred and Ninety (390) calendar days from the date of commencement of the Work for Alternate No. 2.

[ ] By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be ($), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

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Item	Price

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

The Owner shall assess, or the Contractor shall pay to the Owner liquidated damages of $2,000.00 per calendar day that the Contractor fails to achieve Substantial Completion in compliance with the Contract Time.

§ 4.6 Other:
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

N/A

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the last day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the 30th day from the receipt of the Architect's Certificate for Payment. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than Thirty (30) days after the Owner receives the Architect's Certificate for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

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.1 That portion of the Contract Sum properly allocable to completed Work;

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and

.5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

Five (5%) percent unless Contract Sum is less than $500,000.00, in which case the retainage will be ten (10%) percent.

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

N/A

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

N/A

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

Retainage shall be included as part of the Final Application for Payment

§ 5.1.8 NOT USED.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

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§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, including those which extend beyond final payment; and

.2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

Final payment is conditioned upon complying with the requirements set forth in the General Conditions of the Contract for Construction.

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

4.00 % per annum

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[ ] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[X] Litigation in a court of competent jurisdiction

[ ] Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.
Notwithstanding the foregoing, the Owner may at its sole option and consent, agree to arbitrate any such claim dispute or other matter in question between the parties to this Agreement, not exceeding $100,000.00 in value, in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently in effect. All other claims, disputes or other matters in question which exceed $100,000.00 in value shall be asserted through litigation in the appropriate state court. The Parties agree in advance that venue and jurisdiction for any such litigation shall be Tangipahoa Parish, State of Louisiana.

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ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

N/A

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

Michael Watkins
15790 Paul Vega MD Dr
Hammond, LA 70403
watkinsm@northoaks.org

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with a building information modeling exhibit, if completed, or as otherwise set forth below:
(If other than in accordance with a building information modeling exhibit, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

§ 8.7 Other provisions:

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ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction

.4 Drawings

Number	Title	Date
T1.0	COVER SHEET	September 8, 2026 for all Drawings
ADA.1	ADA TYPICAL DETAILS	
LS1.0	LIFE SAFETY PLANS	
C1	DEMO/PHASING PLAN	
C1.1	PROJECT LAYOUT PLAN	
C2.1	LAYOUT PLAN	
C2.2	LAYOUT PLAN	
C3.1	GRADING/DRAINAGE PLAN	
C3.2	GRADING/DRAINAGE PLAN	
C4.1	PAVING PLAN	
C4.2	PAVING PLAN	
C5.1	JOINTING PLAN	
C5.2	JOINTING PLAN	
C6.1	STRIPING/SIGNAGE PLAN	
C6.2	STRIPING/SIGNAGE PLAN	
C7.1	UTILITY PLAN	
C8.1	JOINTING DETAILS	
C9.1	EROSION CONTROL DETAILS	
C10.1	DRAINAGE DETAILS	
C11.1	STANDARD DETAILS	
S0.1	3D VIEWS	
S1.1	FOUNDATION LEVEL 1 FRAMING PLAN	
S1.2	SLAB LEVEL 1 FRAMING PLAN	
S1.3	ENLARGED FOUNDATION & FIRST LEVEL FRAMING PLANS	

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S1.4	FOUNDATION DETAILS - COLUMN SCHEDULE	
S1.5	FOUNDATION DETAILS - COLUMN REINFORCEMENT	
S1.6	FOUNDATION DETAILS - PILES & PILE CAPS	
S1.7	FOUNDATION DETAILS	
S1.8	FOUNDATION DETAILS	
S1.9	FOUNDATION DETAILS	
S2.1	LEVEL 2 FRAMING PLAN	
S2.2	LEVEL 3 FRAMING PLAN	
S2.3	LEVEL 4 FRAMING PLAN (ADD ALTERNATE #1)	
S2.4	LEVEL 5 FRAMING PLAN (ADD ALTERNATE #2)	
S2.5	ROOF FRAMING PLANS	
S3.1	BUILDING SECTIONS	
S4.1	WALL SECTIONS	
S4.2	WALL SECTIONS	
S4.3	WALL SECTIONS	
S4.4	ENLARGED DETAILS	
S5.1	LEVEL 2-5 POST TENSION BEAM DETAILS	
S5.2	LEVEL 2-5 POST TENSION BEAM DETAILS	
S5.3	LEVEL 2-5 POST TENSION BEAM DETAILS	
S5.4	LEVEL 3-5 POST TENSION BEAM DETAILS	
S6.1	ENLARGED ELEVATOR PLANS	
S6.2	ENLARGED STAIR PLANS	
S6.3	ENLARGED STAIR PLANS/SECTIONS	
S6.4	STAIR SECTIONS	
S7.1	GENERAL NOTES AND TYPICAL DETAILS	
S7.2	TYPICAL DETAILS	
A1.0	ARCHITECTURAL SITE PLAN	

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A1.1	ENLARGED SITE PLANS AND SITE DETAILS	
A2.1	LEVEL 1 FLOOR PLAN	
A2.2	LEVEL 2 FLOOR PLAN	
A2.3	LEVEL 3 FLOOR PLAN	
A2.4	LEVEL 4 FLOOR PLAN (ADD ALTERNATE #1)	
A2.5	LEVEL 5 FLOOR PLAN (ADD ALTERNATE #2)	
A4.0	AXONOMETRIC VIEWS	
A4.1	EXTERIOR ELEVATIONS	
A4.2	EXTERIOR ELEVATIONS	
A5.0	WALL SECTIONS	
A5.1	WALL SECTIONS	
A6.0	ENLARGED SECTION & PLAN DETAILS	
A8.0	ENLARGED STAIR AND ELEVATOR PLANS	
A8.1	STAIR SECTIONS	
A8.2	STAIR & ELEVATOR SECTIONS	
A9.0	DOOR SCHEDULE, DOOR AND WINDOW ELEVATIONS	
A11.0	SIGN DETAILS	
M0.0	MECHANICAL COVER SHEET	
M1.0	LEVEL 1 HVAC PLAN	
M1.2	LEVEL 2 HVAC PLAN	
M1.3	LEVEL 3 HVAC PLAN	
M1.4	LEVEL 4 HVAC PLAN (ADD ALTERNATE #1)	
M1.5	LEVEL 5 HVAC PLAN (ADD ALTERNATE #2)	
M2.0	HVAC SCHEDULES AND DETAILS	
P1.1	LEVEL 1 PLUMBING PLAN	
P1.2	LEVEL 2 PLUMBING PLAN	
P1.3	LEVEL 3 PLUMBING PLAN	
P1.4	LEVEL 4 PLUMBING PLAN (ADD ALTERNATE #1)	
P1.5	LEVEL 5 PLUMBING PLAN (ADD ALTERNATE #2)	

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P1.6	LEVEL 1 UTILITY PLAN	
P1.7	LEVEL 2 UTILITY PLAN	
P1.8	LEVEL 3 UTILITY PLAN	
P1.9	LEVEL 4 UTILITY PLAN (ADD ALTERNATE #1)	
P1.10	LEVEL 5 UTILITY PLAN (ADD ALTERNATE #2)	
P1.11	DOMESTIC WATER PIPING DIAGRAM	
P2.0	PLUMBING SCHEDULES AND DETAILS	
SP1.1	LEVEL 1 SPRINKLER PLAN	
SP1.2	LEVEL 2 SPRINKLER PLAN	
SP1.3	LEVEL 3 SPRINKLER PLAN	
SP1.4	LEVEL 4 SPRINKLER PLAN (ADD ALTERNATE #1)	
SP1.5	LEVEL 5 SPRINKLER PLAN (ADD ALTERNATE #2)	
SP2.0	SPRINKLER DETAILS	
E0.0	ELECTRICAL COVER SHEET	
E0.1	ELECTRICAL SITE PLAN - DEMO	
E1.0	ELECTRICAL SITE PLAN - NEW	
E1.1	ELECTRICAL POWER PLAN - 1ST FLOOR	
E1.2	ELECTRICAL POWER PLAN - 2ND & 3RD FLOOR	
E1.3	ELECTRICAL POWER PLAN - 4TH & 5TH FLOOR	
E5.0	ONE-LINE/RISER DIAGRAM - ELECTRICAL	
E6.0	ELECTRICAL SCHEDULES-480V PANELS	
E7.0	ELECTRICAL DETAILS	

.5 Specifications

Section	Title	Date	Pages
All sections	Project Specifications	September 8, 2026	528

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.6 Addenda, if any:

Number	Date	Pages

Addenda will be issued no later than seventy-two (72) hours prior to the date for receipt of Bids. Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.7 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[ ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

[ ] The Sustainability Plan:

Title	Date	Pages

[ ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.8 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*

BY: Michele K. Sutton, FACHE / President & Chief Executive Officer

(Printed name and title)

CONTRACTOR *(Signature)*

BY: Michael W. Hill, AIA, CSI / Partner

(Printed name and title)

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Additions and Deletions Report for
AIA® Document A101® – 2017

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

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PAGE 1:

AGREEMENT made as of the day of in the year 2026

Hospital Service District No. 1 of Tangipahoa Parish dba North Oaks Health

15790 Paul Vega MD Dr
Hammond, LA 70403

North Oaks Health Parking Garage

15790 Paul Vega MD Dr
Hammond, LA 70403

Washer Hill Lipscomb Cabaniss, LLC

1744 Oakdale Drive
Baton Rouge, LA 70810
(225) 620-7703

PAGE 2:

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract ~~represents~~Documents represent the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

[ ]~~———————————————~~ ~~]~~ The date of this Agreement.

[ ]~~———————~~ ~~]~~ A date set forth in a notice to proceed issued by the Owner.

[X] Established as follows:

The date of commencement of the Work will be established in a written Notice to Proceed issued by the Owner.

PAGE 3:

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[X] Not later than (Three Hundred (300) calendar days from the date of commencement of the Work for the Base Bid.

[X] Not later than Three Hundred and Forty-Five (345) calendar days from the date of commencement of the Work for Alternate No. 1.

[X] Not later than Three Hundred and Ninety (390) calendar days from the date of commencement of the Work for Alternate No. 2.

[ ]] By the following date:

PAGE 4:

The Owner shall assess, or the Contractor shall pay to the Owner liquidated damages of $2,000.00 per calendar day that the Contractor fails to achieve Substantial Completion in compliance with the Contract Time.

N/A

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the day last day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the day of the month. 30th day from the receipt of the Architect's Certificate for Payment. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than (Thirty (30) days after the ArchitectOwner receives the Application forArchitect's Certificate for Payment.

PAGE 5:

Five (5%) percent unless Contract Sum is less than $500,000.00, in which case the retainage will be ten (10%) percent.

N/A

N/A

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017Retainage shall be included as part of the Final Application for Payment

§ 5.1.8 NOT USED.

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any,including those which extend beyond final payment; and

Final payment is conditioned upon complying with the requirements set forth in the General Conditions of the Contract for Construction.

PAGE 6:

% 4.00 % per annum

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

[ ]] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

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[X] Litigation in a court of competent jurisdiction

[ ] ~~_____~~ _____] Other (Specify)

Notwithstanding the foregoing, the Owner may at its sole option and consent, agree to arbitrate any such claim dispute or other matter in question between the parties to this Agreement, not exceeding $100,000.00 in value, in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently in effect. All other claims, disputes or other matters in question which exceed $100,000.00 in value shall be asserted through litigation in the appropriate state court. The Parties agree in advance that venue and jurisdiction for any such litigation shall be Tangipahoa Parish, State of Louisiana.

N/A

PAGE 7:

Michael Watkins

15790 Paul Vega MD Dr
Hammond, LA 70403

watkinsm@northoaks.org

~~.4 Building information modeling exhibit, dated as indicated below:~~

~~(Insert the date of the building information modeling exhibit incorporated into this Agreement.)~~

~~.5 _____~~

.4 Drawings

T1.0

COVER SHEET

September 8, 2026 for all Drawings

ADA.1

ADA TYPICAL DETAILS

PAGE 8:

LS1.0

LIFE SAFETY PLANS

C1

DEMO/PHASING PLAN

C1.1

PROJECT LAYOUT PLAN

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C2.1

LAYOUT PLAN

C2.2

LAYOUT PLAN

C3.1

GRADING/DRAINAGE PLAN

C3.2

GRADING/DRAINAGE PLAN

C4.1

PAVING PLAN

C4.2

PAVING PLAN

C5.1

JOINTING PLAN

C5.2

JOINTING PLAN

C6.1

STRIPING/SIGNAGE PLAN

C6.2

STRIPING/SIGNAGE PLAN

C7.1

UTILITY PLAN

C8.1

JOINTING DETAILS

C9.1

EROSION CONTROL DETAILS

C10.1

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DRAINAGE DETAILS

C11.1

STANDARD DETAILS

S0.1

3D VIEWS

S1.1

FOUNDATION LEVEL 1 FRAMING PLAN

S1.2

SLAB LEVEL 1 FRAMING PLAN

S1.3

ENLARGED FOUNDATION & FIRST LEVEL FRAMING PLANS

S1.4

FOUNDATION DETAILS - COLUMN SCHEDULE

S1.5

FOUNDATION DETAILS - COLUMN REINFORCEMENT

S1.6

FOUNDATION DETAILS - PILES & PILE CAPS

S1.7

FOUNDATION DETAILS

S1.8

FOUNDATION DETAILS

S1.9

FOUNDATION DETAILS

S2.1

LEVEL 2 FRAMING PLAN

S2.2

LEVEL 3 FRAMING PLAN

S2.3

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LEVEL 4 FRAMING PLAN (ADD ALTERNATE #1)

S2.4

LEVEL 5 FRAMING PLAN (ADD ALTERNATE #2)

S2.5

ROOF FRAMING PLANS

PAGE 9:

S3.1

BUILDING SECTIONS

S4.1

WALL SECTIONS

S4.2

WALL SECTIONS

S4.3

WALL SECTIONS

S4.4

ENLARGED DETAILS

S5.1

LEVEL 2-5 POST TENSION BEAM DETAILS

S5.2

LEVEL 2-5 POST TENSION BEAM DETAILS

S5.3

LEVEL 2-5 POST TENSION BEAM DETAILS

S5.4

LEVEL 3-5 POST TENSION BEAM DETAILS

S6.1

ENLARGED ELEVATOR PLANS

S6.2

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ENLARGED STAIR PLANS

S6.3

ENLARGED STAIR PLANS/SECTIONS

S6.4

STAIR SECTIONS

S7.1

GENERAL NOTES AND TYPICAL DETAILS

S7.2

TYPICAL DETAILS

A1.0

ARCHITECTURAL SITE PLAN

A1.1

ENLARGED SITE PLANS AND SITE DETAILS

A2.1

LEVEL 1 FLOOR PLAN

A2.2

LEVEL 2 FLOOR PLAN

A2.3

LEVEL 3 FLOOR PLAN

A2.4

LEVEL 4 FLOOR PLAN (ADD ALTERNATE #1)

A2.5

LEVEL 5 FLOOR PLAN (ADD ALTERNATE #2)

A4.0

AXONOMETRIC VIEWS

A4.1

EXTERIOR ELEVATIONS

A4.2

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EXTERIOR ELEVATIONS

A5.0

WALL SECTIONS

A5.1

WALL SECTIONS

A6.0

ENLARGED SECTION & PLAN DETAILS

A8.0

ENLARGED STAIR AND ELEVATOR PLANS

A8.1

STAIR SECTIONS

A8.2

STAIR & ELEVATOR SECTIONS

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A9.0

DOOR SCHEDULE, DOOR AND WINDOW ELEVATIONS

A11.0

SIGN DETAILS

M0.0

MECHANICAL COVER SHEET

M1.0

LEVEL 1 HVAC PLAN

M1.2

LEVEL 2 HVAC PLAN

M1.3

LEVEL 3 HVAC PLAN

M1.4

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LEVEL 4 HVAC PLAN (ADD ALTERNATE #1)

M1.5

LEVEL 5 HVAC PLAN (ADD ALTERNATE #2)

M2.0

HVAC SCHEDULES AND DETAILS

P1.1

LEVEL 1 PLUMBING PLAN

P1.2

LEVEL 2 PLUMBING PLAN

P1.3

LEVEL 3 PLUMBING PLAN

P1.4

LEVEL 4 PLUMBING PLAN (ADD ALTERNATE #1)

P1.5

LEVEL 5 PLUMBING PLAN (ADD ALTERNATE #2)

P1.6

LEVEL 1 UTILITY PLAN

P1.7

LEVEL 2 UTILITY PLAN

P1.8

LEVEL 3 UTILITY PLAN

P1.9

LEVEL 4 UTILITY PLAN (ADD ALTERNATE #1)

P1.10

LEVEL 5 UTILITY PLAN (ADD ALTERNATE #2)

P1.11

DOMESTIC WATER PIPING DIAGRAM

P2.0

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PLUMBING SCHEDULES AND DETAILS

SP1.1

LEVEL 1 SPRINKLER PLAN

SP1.2

LEVEL 2 SPRINKLER PLAN

SP1.3

LEVEL 3 SPRINKLER PLAN

SP1.4

LEVEL 4 SPRINKLER PLAN (ADD ALTERNATE #1)

SP1.5

LEVEL 5 SPRINKLER PLAN (ADD ALTERNATE #2)

SP2.0

SPRINKLER DETAILS

E0.0

ELECTRICAL COVER SHEET

E0.1

ELECTRICAL SITE PLAN - DEMO

PAGE 11:

E1.0

ELECTRICAL SITE PLAN - NEW

E1.1

ELECTRICAL POWER PLAN - 1ST FLOOR

E1.2

ELECTRICAL POWER PLAN - 2ND & 3RD FLOOR

E1.3

ELECTRICAL POWER PLAN - 4TH & 5TH FLOOR

E5.0

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ONE-LINE/RISER DIAGRAM - ELECTRICAL

E6.0

ELECTRICAL SCHEDULES-480V PANELS

E7.0

ELECTRICAL DETAILS

.6 .5 Specifications

All sections

Project Specifications

528

September 8, 2026

.7 6 Addenda, if any:

Addenda will be issued no later than seventy-two (72) hours prior to the date for receipt of Bids. Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 7 Other Exhibits:

[ ]] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:

[ ]] The Sustainability Plan:

[ ]] Supplementary and other Conditions of the Contract:

.9 8 Other documents, if any, listed below:

PAGE 12:

BY: Michael W. Hill, AIA, CSI / Partner

BY: Michele K. Sutton, FACHE / President & Chief Executive Officer

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Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 13:31:39 CDT on 09/08/2026 under Order No. 20250144530 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A101™ - 2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

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AIA® Document A101® – 2017 Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement. between the Owner and the Contractor. dated the day of in the year
(In words, indicate day, month and year.)

for the following **PROJECT**:
(Name and location or address)

North Oaks Health Parking Garage
15790 Paul Vega MD Dr
Hammond. LA 70403

THE OWNER:
(Name, legal status and address)

Hospital Service District No. 1 of Tangipahoa Parish dba North Oaks Health
15790 Paul Vega MD Dr
Hammond. LA 70403

THE CONTRACTOR:
(Name, legal status and address)

ADDITIONS AND DELETIONS:
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This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Document A201®–2017, General Conditions of the Contract for Construction. Article 11 of A201®–2017 contains additional insurance provisions.

TABLE OF ARTICLES

A.1 GENERAL

A.2 OWNER'S INSURANCE

A.3 CONTRACTOR'S INSURANCE AND BONDS

A.4 SPECIAL TERMS AND CONDITIONS

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance. and provide bonds. as set forth in this Exhibit. As used in this Exhibit. the term General Conditions refers to AIA Document A201™–2017. General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work. the Owner shall secure the insurance. and provide evidence of the coverage. required under this Article A.2 and. upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions. definitions, exclusions. and endorsements.

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§ A.2.2 Liability Insurance
The Owner shall be responsible for purchasing and maintaining the Owner's usual general liability insurance.

§ A.2.3 Required Property Insurance
§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

§ A.2.3.1.1 Causes of Loss. The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:
(Indicate below the cause of loss and any applicable sub-limit.)

Causes of Loss	Sub-Limit

§ A.2.3.1.2 Specific Required Coverages. The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:
(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

Coverage	Sub-Limit

§ A.2.3.1.3 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 Deductibles and Self-Insured Retentions. If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

§ A.2.3.2 Occupancy or Use Prior to Substantial Completion. The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

§ A.2.3.3 Insurance for Existing Structures
If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure

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against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

§ A.2.4 Optional Extended Property Insurance.
The Owner shall purchase and maintain the insurance selected and described below.
(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)

[ ] **§ A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance.** to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.

[ ] **§ A.2.4.2 Ordinance or Law Insurance.** for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

[ ] **§ A.2.4.3 Expediting Cost Insurance.** for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

[ ] **§ A.2.4.4 Extra Expense Insurance.** to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

[ ] **§ A.2.4.5 Civil Authority Insurance.** for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

[ ] **§ A.2.4.6 Ingress/Egress Insurance.** for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

[ ] **§ A.2.4.7 Soft Costs Insurance.** to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance; including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

§ A.2.5 Other Optional Insurance.
The Owner shall purchase and maintain the insurance selected below.
(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

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[ ] **§ A.2.5.1 Cyber Security Insurance** for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. *(Indicate applicable limits of coverage or other conditions in the fill point below.)*

[ ] **§ A.2.5.2 Other Insurance**
(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage	Limits

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, its Board, Commissioners, officers, employees and volunteers, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations.

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain, at its expense, the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, in order to protect the Contractor, Owner and Architect from claims that may arise out of or a result from the Contractor's operations under the Contract, whether those operations are by the Contractor or by any subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than One Million and no/100 Dollars ($ 1,000,000.00) each occurrence, Two Million and no/100 Dollars ($ 2,000,000.00) general aggregate, and Two Million and no/100 Dollars ($ 2,000,000.00) aggregate for products-completed operations hazard, providing coverage for claims including

.1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;

.2 personal injury and advertising injury;

.3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;

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.4 bodily injury or property damage arising out of completed operations; and
.5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

.1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
.2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
.3 Claims for bodily injury other than to employees of the insured.
.4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
.5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
.6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
.7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
.8 Claims related to roofing, if the Work involves roofing.
.9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
.10 Claims related to earth subsidence or movement, where the Work involves such hazards.
.11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than One Million and no/100 Dollars ($ 1,000,000.00) combined single and aggregate limit for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage. Contractor agrees that the insurance coverage provided pursuant to this Section automatically provides liability coverage in favor of the Owner.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability (including occupational disease coverage) with policy limits not less than One Million and no/100 Dollars ($ 1,000,000.00) each accident, One Million and no/100 Dollars ($ 1,000,000.00) each employee, and One Million and no/100 Dollars ($ 1,000,000.00) policy limit.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than One Million and no/100 Dollars ($ 1,000,000.00) per claim and One Million and no/100 Dollars ($ 1,000,000.00) in the aggregate.

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§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than One Million and no/100 Dollars ($ 1.000.000.00) per claim and One Million and no/100 Dollars ($ 1.000.000.00) in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than One Million and no/100 Dollars ($ 1.000.000.00) per claim and One Million and no/100 Dollars ($ 1.000.000.00) in the aggregate.

§ A.3.2.11 All subcontractors engaged by the Contractor shall provide the same insurance coverages and limits as required in this Article.

§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.
(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

[ ] **§ A.3.3.2.1** Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:
(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)

[ ] **§ A.3.3.2.2 Railroad Protective Liability Insurance**, with policy limits of not less than ($) per claim and ($) in the aggregate, for Work within fifty (50) feet of railroad property.

[ ] **§ A.3.3.2.3 Asbestos Abatement Liability Insurance**, with policy limits of not less than ($) per claim and ($) in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

[ ] **§ A.3.3.2.4** Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

[ ] **§ A.3.3.2.5** Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

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[ ] **§ A.3.3.2.6 Other Insurance**
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage	Limits
Excess liability insurance written on an umbrella form and excess of all underlying coverages which is at least as broad as the underlying insurance policies.	$10,000,000.00 combined single and aggregate limit
All subcontractors engaged by the Contractor shall provide excess liability insurance in compliance with this Subsection.	$5,000,000.00 combined and single limit

§ A.3.4 Performance Bond and Payment Bond
The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:
(Specify type and penal sum of bonds.)

Type	Penal Sum ($0.00)
Payment Bond	Amount of the Contract Sum
Performance Bond	Amount of the Contract Sum

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS
Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

§ A.4.1 Any deductibles or self-insured retentions must be declared to and accepted by the Owner. For all insurance provided by the Contractor, the Contractor shall be responsible for payment of all deductibles and self-insured retentions. At the option of the Owner, either the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Owner, its officers, officials, employees and volunteers, or the Contractor shall procure a bond guaranteeing payment of losses and related investigation, claim administration and defense expenses.

§ A.4.2 All required insurance shall be provided by a company or companies lawfully authorized to do business in Louisiana. Insurance shall be placed with insurers that have an A. M. Best's rating of A-:VI or higher. This rating requirement may be waived for worker's compensation coverage only. If at any time an insurer issuing any such policy does not meet the minimum A M. Best's rating, the Contractor shall obtain a policy with an insurer that meets the required rating and shall submit another certificate of insurance.

§ A.4.3 The Contractor shall furnish the Owner with Certificates of Insurance reflecting proof of required coverages and deductibles/self-insured retention. The Certificates are to be received and approved by the Owner before Work commences. The Owner reserves the right to request complete certified copies of all insurance policies at any time.

§ A.4.4 The Contractor shall include all Subcontractors as insureds under its policies or shall furnish separate certificates from each Subcontractor. The Contractor shall be responsible for verifying and maintaining the Certificates of Insurance provided by each subcontractor. Subcontractors shall be subject to all of the requirements and coverages stated herein. The Owner reserves the right to request copies of the Subcontractors' Certificates at any time. The Owner has the right to withhold payments to the Contractor until the requirements of this Section

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have been met.

§ A.4.5 The insurance policies and coverages required to be provided and maintained by the Contractor pursuant to the appropriate sections of this Exhibit A. except for any professional liability coverages required under Section A.3.2.8. must be in form and substance satisfactory to the Owner and must in all cases be written on an occurrence basis rather than a claims-made basis. The insurance policies must be issued by a carrier satisfactory to the Owner and authorized to do business in Louisiana and must be maintained under the entire Work is completed. except that the products and completed operation's coverages must be maintained for at least an additional five-year period. following acceptance of the Work.

§ A.4.6 Any failure of the Contractor to comply with reporting provisions of any required policies shall not affect coverage provided to the Owner, its Board. Commissioners. officers. employees or volunteers.

§ A.4.7 The Contractor's insurance coverages required by this Exhibit A shall apply separately to each insured against whom a claim is made or a suit is brought. except with respect to the limits of the insurer's liability.

§ A.4.8 Any insurance policies provided by the Contractor pursuant to this Exhibit A. except worker's compensation and professional liability. if any. shall include a waiver of any right to recover. by subrogation or otherwise. losses or damages against the Owner. Architect and any separate contractor and their respective Boards. Commissioners, officers. employees, consultants and volunteers.

§ A.4.9 Any liability policies furnished and maintained by the Contractor shall be endorsed to require that coverage shall not be canceled or non-renewed. except after receipt by Owner of written notice (certified mail. return receipt requested) at least thirty (30) days prior to any cancellation or non-renewal.

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Additions and Deletions Report for

AIA® Document A101® – 2017 Exhibit A

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PAGE 1:

North Oaks Health Parking Garage

15790 Paul Vega MD Dr
Hammond, LA 70403

Hospital Service District No. 1 of Tangipahoa Parish dba North Oaks Health

15790 Paul Vega MD Dr
Hammond, LA 70403

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§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, its Board, Commissioners, officers, employees and volunteers, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. ~~To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.~~

§ A.3.2.1 The Contractor shall purchase and maintain, at its expense, the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, in order to protect the Contractor, Owner and Architect from claims that may arise out of or a result from the Contractor's operations under the Contract, whether those operations are by the Contractor or by any subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than One Million and no/100 Dollars ($ 1,000,000.00) each occurrence, Two Million and no/100 Dollars ($ 2,000,000.00) general aggregate, and Two Million and no/100 Dollars ($ 2,000,000.00) aggregate for products-completed operations hazard, providing coverage for claims including

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§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than One Million and no/100 Dollars ($ 1,000,000.00) ~~per accident,~~combined single and aggregate limit for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage. Contractor agrees that the insurance coverage provided pursuant to this Section automatically provides liability coverage in favor of the Owner.

§ A.3.2.6 Employers' Liability (including occupational disease coverage) with policy limits not less than One Million and no/100 Dollars ($ 1,000,000.00) each accident, One Million and no/100 Dollars ($ 1,000,000.00) each employee, and One Million and no/100 Dollars ($ 1,000,000.00) policy limit.

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than One Million and no/100 Dollars ($ 1,000,000.00) per claim and One Million and no/100 Dollars ($ 1,000,000.00) in the aggregate.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than One Million and no/100 Dollars ($ 1,000,000.00) per claim and One Million and no/100 Dollars ($ 1,000,000.00) in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than One Million and no/100 Dollars ($ 1,000,000.00) per claim and One Million and no/100 Dollars ($ 1,000,000.00) in the aggregate.

~~§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than ($) per claim and ($) in the aggregate.~~

~~§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than ($) per claim and ($) in the aggregate~~

§ A.3.2.11 All subcontractors engaged by the Contractor shall provide the same insurance coverages and limits as required in this Article.

PAGE 6:

$10,000,000.00 combined single and aggregate limit

$5,000,000.00 combined and single limit

Excess liability insurance written on an umbrella form and excess of all underlying coverages which is at least as broad as the underlying insurance policies.

All subcontractors engaged by the Contractor shall provide excess liability insurance in compliance with this Subsection.

Amount of the Contract Sum

PAGE 7:

Amount of the Contract Sum

§ A.4.1 Any deductibles or self-insured retentions must be declared to and accepted by the Owner. For all insurance provided by the Contractor, the Contractor shall be responsible for payment of all deductibles and self-insured retentions. At the option of the Owner, either the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Owner, its officers, officials, employees and volunteers, or the Contractor shall procure a bond guaranteeing payment of losses and related investigation, claim administration and defense expenses.

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§ A.4.2 All required insurance shall be provided by a company or companies lawfully authorized to do business in Louisiana. Insurance shall be placed with insurers that have an A. M. Best's rating of A- VI or higher. This rating requirement may be waived for worker's compensation coverage only. If at any time an insurer issuing any such policy does not meet the minimum A M. Best's rating, the Contractor shall obtain a policy with an insurer that meets the required rating and shall submit another certificate of insurance.

§ A.4.3 The Contractor shall furnish the Owner with Certificates of Insurance reflecting proof of required coverages and deductibles/self-insured retention. The Certificates are to be received and approved by the Owner before Work commences. The Owner reserves the right to request complete certified copies of all insurance policies at any time.

§ A.4.4 The Contractor shall include all Subcontractors as insureds under its policies or shall furnish separate certificates from each Subcontractor. The Contractor shall be responsible for verifying and maintaining the Certificates of Insurance provided by each subcontractor. Subcontractors shall be subject to all of the requirements and coverages stated herein. The Owner reserves the right to request copies of the Subcontractors' Certificates at any time. The Owner has the right to withhold payments to the Contractor until the requirements of this Section have been met.

§ A.4.5 The insurance policies and coverages required to be provided and maintained by the Contractor pursuant to the appropriate sections of this Exhibit A, except for any professional liability coverages required under Section A.3.2.8, must be in form and substance satisfactory to the Owner and must in all cases be written on an occurrence basis rather than a claims-made basis. The insurance policies must be issued by a carrier satisfactory to the Owner and authorized to do business in Louisiana and must be maintained under the entire Work is completed, except that the products and completed operation's coverages must be maintained for at least an additional five-year period, following acceptance of the Work.

§ A.4.6 Any failure of the Contractor to comply with reporting provisions of any required policies shall not affect coverage provided to the Owner, its Board, Commissioners, officers, employees or volunteers.

§ A.4.7 The Contractor's insurance coverages required by this Exhibit A shall apply separately to each insured against whom a claim is made or a suit is brought, except with respect to the limits of the insurer's liability.

§ A.4.8 Any insurance policies provided by the Contractor pursuant to this Exhibit A, except worker's compensation and professional liability, if any, shall include a waiver of any right to recover, by subrogation or otherwise, losses or damages against the Owner, Architect and any separate contractor and their respective Boards, Commissioners, officers, employees, consultants and volunteers.

§ A.4.9 Any liability policies furnished and maintained by the Contractor shall be endorsed to require that coverage shall not be canceled or non-renewed, except after receipt by Owner of written notice (certified mail, return receipt requested) at least thirty (30) days prior to any cancellation or non-renewal.

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EXHIBIT "B"
To Standard Form of Agreement Between Owner and Contractor
Regarding the North Oaks Health Parking Garage
Dated

CONTRACTOR'S CONDITIONAL
WAIVER OF LIEN FOR CURRENT PROGRESS PAYMENT
and
UNCONDITIONAL WAIVER OF
LIEN FOR PRIOR PROGRESS PAYMENTS

STATE OF LOUISIANA DATE:

PARISH OF TANGIPAHOA

The Undersigned is a General Contractor, Subcontractor, materialman, or other person furnishing labor, services or materials pursuant to that Contract dated between Hospital Service District No. 1 of Tangipahoa Parish dba North Oaks Health (the "Owner") and Undersigned (the "Contractor"), for Work performed on the **North Oaks Health Parking Garage** in Tangipahoa Parish, Louisiana. Said Contract is for the total amount of **$**, for Work on the following described Property:

15790 Paul Vega MD Dr.
Hammond, LA 70401

Contractor submits this Conditional Waiver of Lien Upon Current Progress Payment and Unconditional Waiver of Lien Upon Prior Progress Payments in connection with that Application **#** for Payment dated , submitted by Contractor to Owner in the amount of **$.**

In consideration of receipt of the sum of the current Application for Payment, **$**, the Contractor hereby waives, releases, relinquishes and quitclaims, in favor of Owner and its successors and assigns, and all persons or entities with any legal or equitable interest in the above-referenced Property, any and all right that Contractor has or may have to lien and claim a lien for all work performed and all costs or expenses incurred, including all labor, services and materials furnished, on the above-referenced Property, up to and including the date of this Waiver of Lien, except for the payment of retainage and those items listed in attachment 'A'. This Conditional Waiver of Lien for Current Progress Payment is conditioned upon the Owner's payment to the Contractor being paid in good and sufficient funds by the Bank upon which it is drawn to the account of the Contractor. Once said Bank has made such payment, this Waiver of Lien for Current Progress Payment shall become Unconditional.

Contractor hereby attests that all amounts on prior Applications for Payment have been received from the Owner, and are deemed paid in full, such payments totaling **$** _____ as of the date of this Waiver of Lien. In consideration of receipt of these sums, the Contractor hereby unconditionally waives, releases, relinquishes and quitclaims, in favor of Owner and its successors and assigns, and all persons or entities with any legal or equitable interest in the above-referenced Property, any and all right that Contractor has or may have to lien and claim a lien for all work performed and all costs or expenses incurred, including all labor, services and materials furnished, on the above-referenced Property, up to and including the date of this Waiver of Lien, except for the payment of retainage.

Undersigned does hereby attest that he/she is duly authorized to act on behalf of the Contractor, and further does hereby certify that every performance of labor and/or items of material for which the Contractor is requesting payment has been performed in strict accordance with the terms and conditions of the hereinabove referenced Contract, and that all labor and/or materials for which this payment is requested has been performed and/or delivered as of the date hereinabove mentioned. Further, any and all contractors, subcontractors, laborers, suppliers and materialmen that have provided labor, material or services to the undersigned for use or incorporation into the construction of the improvements to the Property have been paid and satisfied in full, including payments made on equipment in use on the Project, including that on rental and lease purchase agreements, excepting only amounts in the current Application for Payment dated _____, and retainage, if any, thereon. Contractor further attests that there are no outstanding claims of any character arising out of, or related to, the Contractor's activities on, or improvements to, the Property.

This Waiver constitutes a representation by the undersigned, for and on behalf of the firm or company listed below, that the payments referenced above, once received, constitute full and complete payment for all work performed, and all costs or expenses incurred (including, but not limited to, costs for supervision, field office overhead, home office overhead, interest on capital, profit, and general conditions costs) relative to the work or improvements at the Property as of the date of this Waiver, except for the payment of retainage. The undersigned hereby specifically waives, quitclaims and releases any Claim, as that term is defined in the Contract Documents, for damages due to delay, hindrance, interference, acceleration, inefficiencies or extra work, or any other claim of any kind it may have against the Owner, or any other person or entity with a legal or equitable interest in the Property, as of the date of this Waiver, except as follows:

[No Exceptions]

This Waiver is specifically made for the benefit of the Owner and may be relied upon unconditionally by the Owner.

In Witness hereof, the undersigned signatory, acting for and on behalf of the firm or company listed below, and all of its laborers, subcontractors and suppliers, has placed his hand and seal.

CONTRACTOR: _____.

By (Signature): _____
Print Name: _____
Title: _____

Sworn to and subscribed before me, this ____day of _____, 2025.

_____
NOTARY PUBLIC in and for the
PARISH OF TANGIPAHOA
STATE OF LOUISIANA

(NOT TO BE SUBMITTED WITH BID)

NON-COLLUSION AFFIDAVIT (Regarding LSA – R.S. 38.2224)

STATE OF LOUISIANA

PARISH OF _____

(Project Name) _____

_____

(Project Address) _____

_____

AFFIDAVIT

Before me, the undersigned authority, duly commissioned and qualified within and for the State and Parish aforesaid, personally came and appeared _____ representing _____ who, being by me first duly sworn deposed and said that he has read this affidavit and does hereby agree under oath to comply with all provisions herein as follows:

Section 2224 of Part II of Chapter 10 of Title 38 of the Louisiana Revised Statutes, as amended.

1) That affiant employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he received payment, other than persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of the public building or project or in securing the public contract were in the regular course of their duties for affiant; and

2) That no part of the Contract price received by affiant was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the Contract, other than the payment of their normal compensation to persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of the public building or project were in the regular course of their duties for affiant.

THUS DONE AND SIGNED BEFORE ME, THE UNDERSIGNED Notary Public and subscribing witnesses on this _____ day of _____, 2014, at _____, LA

_____ _____

WITNESS By:

_____ _____

WITNESS NOTARY PUBLIC

Project No.

North Oaks Health Parking Garage

Name of Project

STATE OF LOUISIANA

PARISH OF TANGIPAHOA

ATTESTATIONS AFFIDAVIT

Before me, the undersigned notary public, duly commissioned and qualified in and for the parish and state aforesaid, personally came and appeared Affiant, who after being duly sworn, attested as follows:

LA. R.S. 38:2227 PAST CRIMINAL CONVICTIONS OF BIDDERS

A. No sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named below has been convicted of, or has entered a plea of guilty or nolo contendere to any of the following state crimes or equivalent federal crimes:

(a) Public bribery (R.S. 14:118)
(b) Corrupt influencing (R.S. 14:120)
(c) Extortion (R.S. 14:66)
(d) Money laundering (R.S. 14:230)

B. Within the past five years from the project bid date, no sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named below has been convicted of, or has entered a plea of guilty or nolo contendere to any of the following state crimes or equivalent federal crimes, during the solicitation or execution of a contract or bid awarded pursuant to the provisions of Chapter 10 of Title 38 of the Louisiana Revised Statutes:

(a) Theft (R.S. 14:67)
(b) Identity Theft (R.S. 14:67.16)
(c) Theft of a business record (R.S.14:67.20)
(d) False accounting (R.S. 14:70)
(e) Issuing worthless checks (R.S. 14:71)
(f) Bank fraud (R.S. 14:71.1)
(g) Forgery (R.S. 14:72)
(h) Contractors; misapplication of payments (R.S. 14:202)
(i) Malfeasance in office (R.S. 14:134)

LA. R.S. 38:2212.10 Verification of Employees

A. At the time of bidding, Appearer is registered and participates in a status verification system to verify that all new hires in the state of Louisiana are legal citizens of the United States or are legal aliens.

B. If awarded the contract, Appearer shall continue, during the term of the contract, to utilize a status verification system to verify the legal status of all new employees in the state of Louisiana.

C. If awarded the contract, Appearer shall require all subcontractors to submit to it a sworn affidavit verifying compliance with Paragraphs (A) and (B) of this Subsection.

Project No.

North Oaks Health Parking Garage
Name of Project

LA. R.S. 23:1726(B) Certification Regarding Unpaid Workers Compensation Insurance

A. R.S. 23:1726 prohibits any entity against whom an assessment under Part X of Chapter 11 of Title 23 of the Louisiana Revised Statutes of 1950 (Alternative Collection Procedures & Assessments) is in effect, and whose right to appeal that assessment is exhausted, from submitting a bid or proposal for or obtaining any contract pursuant to Chapter 10 of Title 38 of the Louisiana Revised Statutes of 1950 and Chapters 16 and 17 of Title 39 of the Louisiana Revised Statutes of 1950.

B. By signing this bid /proposal, Affiant certifies that no such assessment is in effect against the bidding / proposing entity.

NAME OF BIDDER	**NAME OF AUTHORIZED SIGNATORY OF BIDDER**
DATE	**TITLE OF AUTHORIZED SIGNATORY OF BIDDER**

SIGNATURE OF AUTHORIZED
SIGNATORY OF BIDDER/AFFIANT

Sworn to and subscribed before me by Affiant on the _____ day of _____ , 20___ .

_____
Notary Public

R-1020 (4/12)

LDR
Contributing to a better quality of life

Designation of Construction Contractor as Agent of a Governmental Entity Sales Tax Exemption Certificate

_____ , an agency of the United
Legal Name of Governmental Entity

States government, or an agency, board, commission, or instrumentality of the State of Louisiana or its political subdivisions, including parishes, municipalities and school boards, does hereby designate the following contractor as its agent for the purpose of making sales tax exempt purchases on behalf of the governmental body:

Name of Contractor		
Address		
City	State	ZIP

This designation of agency shall be effective for purchases of component construction materials, taxable services and leases and rentals of tangible personal property for the following named construction project:

Construction Project	Contract Number

This designation and acceptance of agency is effective for the period

Beginning Date *(mm/dd/yyyy)*	End Date *(mm/dd/yyyy)*

Purchases for the named project during this period by the designated contractor shall be considered as the legal equivalent of purchases directly by the governmental body. Any materials purchased by this agent shall immediately, upon the vendor's delivery to the agent, become the property of this government entity. This government entity, as principal, assumes direct liability to the vendor for the payment of any property, services, leases, or rentals made by this designated agent. This agreement does not void or supersede the obligations of any party created under any construction contract related to this project, including specifically any contractual obligation of the construction contractor to submit payment to the vendors of materials or services for the project.

This contractor-agent is not authorized to delegate this purchasing agency to others; separate designations of agency by this governmental entity are required for each contractor or sub-contractor who is to purchase on behalf of this governmental entity. The undersigned hereby certify that this designation is the entirety of the agency designation agreement between them. In order for a purchase for an eligible governmental entity through a designated agent to be eligible for sales tax exemption, the designation of agency must be made, accepted, and disclosed to the vendor before or at the time of the purchase transaction.

Designation of Agency		
Signature of Authorized Designator		Date *(mm/dd/yyyy)*
Name of Authorized Designator		
Name of Governmental Entity		
Address		
City	State	ZIP

Acceptance of Agency		
Signature of Contractor or Subcontractor Authorized Acceptor		Date *(mm/dd/yyyy)*
Name of Contractor's or Subcontractor's Acceptor		
Name of Contractor		
Address		
City	State	ZIP

This designation of agency form, when properly executed by both the contractor and the governmental entity, shall serve as evidence of the sales tax exempt status that has been conferred onto the contractor. No other exemption certificate form is necessary to claim exemption from sales taxes. The agency agreement evidenced by this sales tax exemption certificate must be implemented at the time of contract execution with the governmental entity. The contract between the governmental entity and his agent must contain provisions to authenticate the conferment of agency.

DIVISION 01

GENERAL REQUIREMENTS

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Contract description.
3. Future work.
4. Work sequence.
5. Work restrictions.
6. Owner occupancy.
7. Permits.
8. Specification conventions.

B. Related Requirements:

1. Section 012000 - Price and Payment Procedures.
2. Section 013216 - Construction Progress Schedule: Digital project management procedures and web-based project management software package.
3. Section 015000 - Temporary Facilities and Controls: Limitations and procedures governing temporary use of Owner's facilities.
4. Section 017000 - Execution and Closeout Requirements: Coordination of Owner-installed products.

1.2 PROJECT INFORMATION

A. Name: North Oaks Health Parking Garage.

1. Project Location: Hammond, LA.

B. Owner:

1. Owner's Representative: Michael Watkins.

C. Project Architect: WHLC Architecture.

1. Architect's Representative: Matthew Caillouet.

D. Architect's/Engineer's Consultants: Architect/Engineer retains the following design professionals, who prepare designated portions of the Contract Documents:

1. ADG:.

a. Representative: Roland LeLeux.

E. Contractor: To be determined.

1. Contractor Representative:

F. Project Coordinator for Multiple Contracts: Owner shall serve as Project coordinator.

1.3 CONTRACT DESCRIPTION

A. Work of the Project includes construction of a Parking Garage.

1.4 WORK SEQUENCE

A. Construct Work in a logical orderly manner during construction period. Coordinate construction schedule and operations with Architect and Owner:

1.5 WORK RESTRICTIONS

A. Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction (AHJ).

B. Noise, Vibration, Dust, and Odors: Coordinate with Owner operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy.

C. Smoking and Controlled Substance Restrictions: Use of tobacco products , alcoholic beverages, marijuana and other controlled substances on Owner's property is not permitted.

D. Employee Identification: Provide identification tags for Contractor personnel working on Project Site. Require personnel to use identification tags at all times.

E. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project Site.

1. Maintain list of approved screened personnel with Owner's representative.

1.6 OWNER OCCUPANCY

A. Owner will not occupy building until entire project is substantially complete.

1.7 PERMITS

A. Furnish all necessary permits for construction of Work, including the following:

1.8 SPECIFICATION CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.

B. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 011000

SECTION 012000 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Schedule of Values.

B. Application for Payment.

C. Change procedures.

D. Defect assessment.

1.2 SCHEDULE OF VALUES

A. Submit printed schedule on AIA G703 - Continuation Sheet for G702.

B. Submit Schedule of Values in duplicate within 20 days after date of Owner-Contractor Agreement.

C. Format: Use Table of Contents of this Project Manual. Identify each line item with number and title of major Specification Section. Also identify Site mobilization and bonds and insurance.

D. Include separately from each line item, direct proportional amount of Contractor's overhead and profit.

E. Revise schedule to list approved Change Orders with each Application for Payment.

1.3 APPLICATION FOR PAYMENT

A. Submit three copies of each Application for Payment on AIA G702 - Application and Certificate for Payment and AIA G703 - Continuation Sheet for G702.

B. Content and Format: Use Schedule of Values for listing items in Application for Payment.

C. Submit updated construction schedule with each Application for Payment.

D. Payment Period: Submit at intervals stipulated in the Agreement , 30 days.

E. Submit submittals with transmittal letter as specified in Section 013300 - Submittal Procedures.

F. Substantiating Data: When Architect/Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:

1. Current construction photographs specified in Section 013300 - Submittal Procedures.
2. Partial release of liens from major Subcontractors and vendors.

3. Record Documents as specified in Section 017000 - Execution and Closeout Requirements, for review by Owner, which will be returned to Contractor.
4. Affidavits attesting to off-Site stored products.
5. Construction Progress Schedule, revised and current as specified in Section 013300 - Submittal Procedures.

1.4 CHANGE PROCEDURES

A. Submittals: Submit name of individual who is authorized to receive change documents and is responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.

B. Carefully study and compare Contract Documents before proceeding with fabrication and installation of Work. Promptly advise Architect/Engineer of any error, inconsistency, omission, or apparent discrepancy. RFIs may not be used to obtain approval of substitutions, transfer coordination responsibility, or create entitlement based on information reasonably inferable from the documents.

C. Requests for Interpretation (RFI) and Clarifications: Allot time in construction scheduling for liaison with Architect/Engineer; establish procedures for handling queries and clarifications.

1. Use AIA G716 - Request for Information for requesting interpretations.
2. Architect/Engineer may respond with a direct answer on the Request for Interpretation form, Clarification Notice.

D. Architect/Engineer will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing supplemental instructions on AIA G710.

E. Architect/Engineer may issue an ASI (Architectural Supplemental Instructions including a detailed description of proposed change with supplementary or revised Drawings and Specifications, a change in Contract Time for executing the change. Contractor will prepare and submit estimate within 14 days.

F. Contractor may propose changes by submitting a request for change to Architect/Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change and the effect on Contract Sum/Price and Contract Time with full documentation.

G. Stipulated Sum/Price Change Order: Based on ASI (Architectural Supplemental Instructions) and Contractor's fixed price quotation or Contractor's request for Change Order as approved by Architect/Engineer.

H. Construction Change Directive: Architect/Engineer may issue directive, on AIA G714 - Construction Change Directive signed by Owner, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute change.

I. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of the Contract.

Architect/Engineer will determine change allowable in Contract Sum/Price and Contract Time as provided in Contract Documents.

J. Maintain detailed records of Work done on time and material basis. Provide full information required for evaluation of proposed changes and to substantiate costs for changes in the Work.

K. Document each quotation for change in Project Cost or Time with sufficient data to allow evaluation of quotation.

L. Change Order Forms: AIA G701 - Change Order.

M. Execution of Change Orders: Architect/Engineer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.

N. Correlation of Contractor Submittals:

1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
2. Promptly revise Progress Schedules to reflect change in Contract Time, revise subschedules to adjust times for other items of Work affected by the change, and resubmit.
3. Promptly enter changes in Record Documents.

1.5 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct appropriate remedy or adjust payment.

C. The defective Work may remain, but unit sum/price will be adjusted to new sum/price at discretion of Architect.

D. Defective Work will be partially repaired according to instructions of Architect.

E. Individual Specification Sections may modify these options or may identify specific formula or percentage sum/price reduction.

F. Authority of Architect to assess defects and identify payment adjustments is final.

G. Nonpayment for Rejected Products: Payment will not be made for rejected products for any of the following reasons:

1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from transporting vehicle.
4. Products placed beyond lines and levels of the required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected products.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 012000

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Quality assurance.

B. Product options.

C. Product substitution procedures.

1.2 QUALITY ASSURANCE

A. Contract is based on products and standards established in Contract Documents without consideration of proposed substitutions.

B. Products specified define standard of quality, type, function, dimension, appearance, and performance required.

C. Substitution Proposals: Permitted for specified products except where specified otherwise. Do not substitute products unless substitution has been accepted and approved in writing by Owner.

1.3 PRODUCT OPTIONS

A. See Section 016000 - Product Requirements.

1.4 PRODUCT SUBSTITUTION PROCEDURES

A. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during Bidding period.

B. Substitutions may be considered when a product becomes unavailable through no fault of Contractor.

C. Document each request with complete data, substantiating compliance of proposed substitution with Contract Documents, including:

1. Manufacturer's name and address, product, trade name, model, or catalog number, performance and test data, and reference standards.
2. Itemized point-by-point comparison of proposed substitution with specified product, listing variations in quality, performance, and other pertinent characteristics.
3. Reference to Article and Paragraph numbers in Specification Section.
4. Cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.
5. Changes required in other Work.

6. Availability of maintenance service and source of replacement parts as applicable.
7. Certified test data to show compliance with performance characteristics specified.
8. Samples when applicable or requested.
9. Other information as necessary to assist Architect/Engineer's evaluation.

D. A request constitutes a representation that Bidder or Contractor:

1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
2. Will provide same warranty for substitution as for specified product.
3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Will coordinate installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
6. Will reimburse Owner and Architect for review or redesign services associated with reapproval by authorities having jurisdiction.

E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals without separate written request or when acceptance will require revision to Contract Documents.

F. Substitution Submittal Procedure:

1. Submit requests for substitutions on CSI Form 13.1A Substitution Request.
2. Submit three copies electronic files to Project website of Request for Substitution for consideration. Limit each request to one proposed substitution.
3. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
4. Architect/Engineer will notify Contractor in writing of decision to accept or reject request.

1.5 INSTALLER SUBSTITUTION PROCEDURES

A. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during Bidding period.

B. Document each request with:

1. Installer's qualifications.
2. Installer's experience in work similar to that specified.
3. Other information as necessary to assist Architect/Engineer's evaluation.

C. Substitution Submittal Procedure:

1. Submit electronic files to Project website of Request for Substitution for consideration. Limit each request to one proposed substitution.
2. Architect/Engineer will notify Contractor in writing of decision to accept or reject request.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 012500

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Coordination and Project conditions.

B. Preconstruction meeting.

C. Site mobilization meeting.

D. Progress meetings.

E. Preinstallation meetings.

F. Closeout meeting.

G. Alteration procedures.

1.2 COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and Work of various Sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements , with provisions for accommodating items installed later.

B. Verify that utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate Work of various Sections having interdependent responsibilities for installing, connecting to, and placing operating equipment in service.

C. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit as closely as practical; place runs parallel with lines of building. Use spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

1. Coordination Drawings: Prepare as required to coordinate all portions of Work. Show relationship and integration of different construction elements that require coordination during fabrication or installation to fit in space provided or to function as intended. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are important.

D. Coordination Meetings: In addition to other meetings specified in this Section, hold coordination meetings with personnel and Subcontractors to ensure coordination of Work.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of Work of separate Sections in preparation for Substantial Completion.

G. After Owner's occupancy of premises, coordinate access to Site for correction of defective Work and Work not complying with Contract Documents, to minimize disruption of Owner's activities.

1.3 PRECONSTRUCTION MEETING

A. Contractor will schedule and preside over meeting after Notice of Award.

B. Attendance Required: Architect/Engineer, Owner, Construction Manager, major Subcontractors, and Contractor.

C. Minimum Agenda:

1. Execution of Owner-Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of list of Subcontractors, list of products, schedule of values, and Progress Schedule.
5. Designation of personnel representing parties in Contract, and Architect/Engineer.
6. Communication procedures.
7. Procedures and processing of requests for interpretations, field decisions, field orders, submittals, substitutions, Applications for Payments, proposal request, Change Orders, and Contract closeout procedures.
8. Scheduling.
9. Critical Work sequencing.
10. Scheduling activities of Geotechnical Engineer.

D. Contractor: Record minutes and distribute copies to participants within two days after meeting, with copies each to Architect/Engineer, Owner, and those affected by decisions made.

1.4 SITE MOBILIZATION MEETING

A. Contractor will schedule and preside over meeting at Project Site prior to Contractor occupancy.

B. Attendance Required: Architect/Engineer, Owner, Contractor, and major Subcontractors,.

C. Minimum Agenda:

1. Use of premises by Owner and Contractor.
2. Owner's requirements and occupancy.
3. Construction facilities and controls.
4. Temporary utilities.
5. Survey and building layout.
6. Security and housekeeping procedures.
7. Schedules.
8. Procedures for testing.

9. Procedures for maintaining record documents.
10. Requirements for startup of equipment.
11. Inspection and acceptance of equipment put into service during construction period.

D. Contractor: Record minutes and distribute copies to participants within two days after meeting, with copies each to Architect, Owner, and those affected by decisions made.

1.5 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, and preside over meetings.

C. Attendance Required: Job superintendent, major Subcontractors, Contractors and suppliers, and Architect, Owner, as appropriate to agenda topics for each meeting.

D. Minimum Agenda:

1. Review minutes of previous meetings.
2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems impeding planned progress.
5. Review of submittal schedule and status of submittals.
6. Review of off-Site fabrication and delivery schedules.
7. Maintenance of Progress Schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on Progress Schedule and coordination.
13. Other business relating to Work.

E. Contractor: Record minutes and distribute copies to participants within two days after meeting, with copies each to Architect, Owner, and those affected by decisions made.

1.6 PREINSTALLATION MEETINGS

A. When required in individual Specification Sections, convene preinstallation meetings at Project Site before starting Work of specific Section.

B. Require attendance of parties directly affecting, or affected by, Work of specific Section.

C. Notify Architect/Engineer seven days in advance of meeting date.

D. Prepare agenda and preside over meeting:

1. Review conditions of installation, preparation, and installation procedures.
2. Review coordination with related Work.

E. Record minutes and distribute copies to participants within two days after meeting, with copies each to Architect, Owner, and those affected by decisions made.

1.7 CLOSEOUT MEETING

A. Schedule Project closeout meeting with sufficient time to prepare for requesting Substantial Completion. Preside over meeting and be responsible for minutes.

B. Attendance Required: Contractor, Architect, Owner, and others appropriate to agenda.

C. Notify Architect/Engineer seven days in advance of meeting date.

D. Minimum Agenda:

1. Start-up of facilities and systems.
2. Operations and maintenance manuals.
3. Testing, adjusting, and balancing.
4. System demonstration and observation.
5. Operation and maintenance instructions for Owner's personnel.
6. Temporary indoor-air-quality plan and procedures.
7. Contractor's inspection of Work.
8. Contractor's preparation of an initial "punch list."
9. Procedure to request Architect/Engineer inspection to determine date of Substantial Completion.
10. Completion time for correcting deficiencies.
11. Inspections by authorities having jurisdiction.
12. Certificate of Occupancy and transfer of insurance responsibilities.
13. Partial release of retainage.
14. Final cleaning.
15. Preparation for final inspection.
16. Closeout Submittals:

    a. Project record documents.
    b. Operating and maintenance documents.
    c. Operating and maintenance materials.
    d. Affidavits.

17. Final Application for Payment.
18. Contractor's demobilization of Site.
19. Maintenance.

E. Record minutes and distribute copies to participants within two days after meeting, with copies each to Architect, Owner, and those affected by decisions made.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 ALTERATION PROCEDURES

A. Designated areas of existing facilities will be occupied for normal operations during progress of construction. Cooperate with Owner in scheduling operations to minimize conflict and to permit continuous usage.

1. Perform Work not to interfere with operations of occupied areas.
2. Keep utility and service outages to a minimum and perform only after written approval of Owner.
3. Clean Owner-occupied areas daily. Clean spillage, overspray, and heavy collection of dust in Owner-occupied areas immediately.

B. Materials: As specified in product Sections; match existing products with new products for patching and extending Work.

C. Employ skilled and experienced installer to perform alteration and renovation Work.

D. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion. Comply with Section 017000 - Execution and Closeout Requirements

E. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.

F. Remove debris and abandoned items from area and from concealed spaces.

G. Prepare surface and remove surface finishes to permit installation of new Work and finishes.

H. Close openings in exterior surfaces to protect existing Work from weather and extremes of temperature and humidity.

I. Remove, cut, and patch Work to minimize damage and to permit restoring products and finishes to original condition.

J. Refinish existing visible surfaces to remain in renovated rooms and spaces, to specified condition for each material, with neat transition to adjacent finishes.

K. Where new Work abuts or aligns with existing Work, provide smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.

L. When finished surfaces are cut so that smooth transition with new Work is not possible, terminate existing surface along straight line at natural line of division and submit recommendation to Architect/Engineer for review.

M. Where change of plane of 1/4 inch or more occurs, submit recommendation for providing smooth transition to Architect/Engineer for review.

N. Trim existing doors to clear new floor finish. Refinish trim to [**original**] [**or**] [**specified**] condition.

O. Patch or replace portions of existing surfaces that are damaged, lifted, discolored, or showing other imperfections.

P. Finish surfaces as specified in individual product Sections.

END OF SECTION 013000

SECTION 013216 - CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Web-based project management software package.

B. Digital Project data licensing.

C. Submittals.

D. Quality assurance.

E. Format for network analysis schedules.

F. Network analysis schedules.

G. Bar chart schedules.

H. Review and evaluation.

I. Updating schedules.

J. Distribution.

1.2 WEB-BASED PROJECT MANAGEMENT SOFTWARE PACKAGE

A. Web-Based Project Management Software Package: Use Architect's web-based Project management software package for purposes of hosting and managing Project communication and documentation until final completion.

1. Web-based Project management software includes, at a minimum, the following features:

a. Compilation of Project data, including Contractor, Subcontractors, Architect/Engineer, Architect's/Engineer's consultants, Owner, and other entities involved in Project. Include names of individuals and contact information.
b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.
c. Document workflow planning, allowing customization of workflow among Project entities.
d. Create, log, track, and notify Project members of Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, minor changes in the Work, Construction Change Directives, and Change Orders.
e. Track status of each Project communication in real time, and log time and date when responses are provided.
f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.

g. Process and track payment applications.
h. Process and track contract modifications.
i. Create and distribute meeting minutes.
j. Document management for Drawings, Specifications, and coordination drawings, including revision control.
k. Management of construction progress photographs.
l. Mobile device compatibility, including smartphones and tablets.

B. Provide up to seven Project management software user licenses for use by Owner, Owner's Commissioning Authority, Architect/Engineer, and Architect's/Engineer's consultants.

1. At completion of Project, provide digital archive in format that is readable by common desktop software applications and acceptable to Architect. Provide data in locked format to prevent further changes.
2. Manufacturers:

a. Newforma.

3. Products: Provide one of the above Project management software packages under the current published licensing agreements.

1.3 DIGITAL PROJECT DATA LICENSING

A. Use of Architect's/Engineer's Digital Data Files: Digital data files of Architect's/Engineer's BIM model will be provided by Architect/Engineer for Contractor's use during construction.

B. Conditions for Use:

1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
2. Architect/Engineer makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
3. Digital Drawing Software Program: Contract Drawings are available in AutoCAD and Revit.
4. Contractor shall execute a data licensing agreement in the form of AIA Document C106 Digital Data Licensing Agreement.

a. Subcontractors and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of AIA Document C106.

5. The following digital data files will be furnished for each appropriate discipline:

a. Floor plans.
b. Reflected ceiling plans.

1.4 SUBMITTALS

A. Within 10 days after date of Owner-Contractor Agreement, submit proposed preliminary network diagram defining planned operations for first 60 days of Work, with general outline for remainder of Work.

B. Participate in review of preliminary and complete network diagrams jointly with Architect/Engineer.

C. Within 20 days after joint review of proposed preliminary network diagram, submit draft of proposed complete network diagram for review. Include written certification that major Subcontractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete network analysis consisting of network diagrams and mathematical analyses.

E. Submit updated network schedules with each Application for Payment.

F. Post as electronic file to Project website.

G. Submit network schedules under transmittal letter form specified in Section 013300 - Submittal Procedures.

H. Schedule Updates:

1. Overall percent complete, projected and actual.
2. Completion progress by listed activity and sub-activity, to within [**five**] [**working**] days prior to submittal.
3. Changes in Work scope and activities modified since submittal.
4. Delays in submittals or resubmittals, deliveries, or Work.
5. Adjusted or modified sequences of Work.
6. Other identifiable changes.
7. Revised projections of progress and completion.

I. Narrative Progress Report:

1. Submit with each monthly submission of Progress Schedule.
2. Summary of Work completed during the past period between reports.
3. Work planned during the next period.
4. Explanation of differences between summary of Work completed and Work planned in previously submitted report.
5. Current and anticipated delaying factors and estimated impact on other activities and completion milestones.
6. Corrective action taken or proposed.

1.5 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel specializing in CPM scheduling with two years' minimum experience in scheduling construction work of complexity comparable to the Project, and having use of computer facilities capable of delivering detailed graphic printout within 48 hours

of request , and having use of computer facilities capable of delivering detailed graphic printout within 2 hours of request.

B. Contractor's Administrative Personnel: 5 years' minimum experience in using and monitoring CPM schedules on comparable Projects.

1.6 NETWORK ANALYSIS SCHEDULES

A. Format For Network Analysis Schedule

1. Listings: Reading from left to right, in ascending order for each activity. Identify each activity with applicable Specification Section number.
2. Diagram Sheet Size: 24 inches high x 36 inches wide required.
3. Scale and Spacing: To allow for notations and revisions.

B. Prepare network analysis diagrams and supporting mathematical analyses using critical path method.

C. Illustrate order and interdependence of activities and sequence of Work; how start of given activity depends on completion of preceding activities, and how completion of activity may restrain start of subsequent activities.

D. Illustrate complete sequence of construction by activity, identifying Work of separate floors. Indicate dates for submittals , including dates for Owner-furnished items, and return of submittals; dates for procurement and delivery of critical products; and dates for installation and provision for testing. Include legend for symbols and abbreviations used.

E. Mathematical Analysis: Tabulate each activity of detailed network diagrams using calendar dates, and identify for each activity:

1. Preceding and following event numbers.
2. Activity description.
3. Estimated duration of activity, in maximum 15-day intervals. Status of critical activities.
4. Earliest start date.
5. Earliest finish date.
6. Actual start date.
7. Actual finish date.
8. Latest start date.
9. Latest finish date.
10. Total and free float; accrue float time to Owner and to Owner's benefit.
11. Monetary value of activity, keyed to Schedule of Values.
12. Percentage of activity completed.
13. Responsibility.

F. Analysis Program: Capable of accepting revised completion dates, and of recomputing of scheduled dates and float.

G. Required Sorts: List activities in sorts or groups:

1. By preceding Work item or event number from lowest to highest.

2. By longest float, then in order of early start.
3. By responsibility in order of earliest possible start date.
4. In order of latest allowable start dates.
5. In order of latest allowable finish dates.
6. Contractor's periodic payment request sorted by Schedule of Values list.
7. List of basic input data-generating report.
8. List of activities on critical path.

H. Prepare subschedules for each stage of Work and Sequencing of Construction Plan identified in Section 011000 - Summary.

I. Coordinate contents with Schedule of Values in Section 013300 - Submittal Procedures.

J. Bar Chart Schedules

1. Format: Bar chart Schedule, to include at least:

a. Identification and listing in chronological order of those activities reasonably required to complete the Work, including:

1) Subcontract Work.
2) Major equipment design, fabrication, factory testing, and delivery dates including required lead times.
3) Move-in and other preliminary activities.
4) Equipment and equipment system test and startup activities.
5) Project closeout and cleanup.
6) Work sequences, constraints, and milestones.

b. Listings identified by Specification Section number.
c. Identification of the following:

2. Horizontal time frame by year, month, and week.
3. Duration, early start, and completion for each activity and subactivity.
4. Critical activities and Project float.
5. Subschedules to further define critical portions of Work.

1.7 REVIEW AND EVALUATION

A. Participate in joint review and evaluation of schedules with Architect/Engineer at each submittal.

B. Evaluate Project status to determine Work behind schedule and Work ahead of schedule.

C. After review, revise schedules incorporating results of review, and resubmit within 10 days.

1.8 UPDATING SCHEDULES

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity. Update schedules to depict current status of Work.

C. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

D. Upon approval of a Change Order, include the change in the next schedule submittal.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit sorts as required to support recommended changes.

G. Prepare narrative report to define problem areas, anticipated delays, and impact on schedule. Report corrective action taken or proposed and its effect including effects of changes on schedules of separate Contractors.

1.9 DISTRIBUTION

A. Following joint review, distribute copies of updated schedules to Contractor's Project site file, Subcontractors, suppliers, Architect/Engineer, Owner.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 013216

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Definitions.

B. Submittal procedures.

C. Construction progress schedules.

D. Proposed product list.

E. Product data.

F. Use of electronic CAD files of Project Drawings.

G. Shop Drawings.

H. Samples.

I. Other submittals.

J. Design data.

K. Test reports.

L. Certificates.

M. Manufacturer's instructions.

N. Manufacturer's field reports.

O. Erection Drawings.

P. Construction photographs.

Q. Contractor review.

R. Architect/Engineer review.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect/Engineer's responsive action.

B. Informational Submittals: Written and graphic information and physical Samples that do not require Architect/Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

A. Transmit each submittal with Architect/Engineer-accepted form.

B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.

C. Identify: Project, Contractor, Subcontractor and supplier, pertinent Drawing and detail number, and Specification Section number appropriate to submittal.

D. Apply Contractor's stamp, signed or initialed, certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is according to requirements of the Work and Contract Documents.

E. Schedule submittals to expedite Project, and post electronic submittals as PDF electronic files to Project website, submit electronic submittals via email as PDF electronic files. Coordinate submission of related items.

F. For each submittal for review, allow 15 days excluding delivery time to and from Contractor.

G. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.

H. Allow space on submittals for Contractor and Architect/Engineer review stamps.

I. When revised for resubmission, identify changes made since previous submission.

J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

K. Submittals not requested will not be recognized nor processed.

L. Incomplete Submittals: Architect/Engineer will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of Architect/Engineer.

1.4 CONSTRUCTION PROGRESS SCHEDULES

A. Comply with Section 013216 - Construction Progress Schedule

1.5 PROPOSED PRODUCT LIST

A. Within 15 days after date of Owner-Contractor Agreement, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

1.6 PRODUCT DATA

A. Product Data: Action Submittal: Submit to Architect/Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents.

B. Post electronic submittals as PDF electronic files to Project website.

C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.7 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.

B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:

1. Use of files is solely at receiver's risk. Architect/Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Architect/Engineer of discrepancy and use information in hard-copy Drawings and Specifications.
2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
4. Receiver shall not hold Architect/Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
5. Receiver shall understand that even though Architect/Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
6. Receiver shall not hold Architect/Engineer responsible for such viruses or their consequences, and shall hold Architect/Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.

C. Costs: $150.00 per file, plus administrative fee of $50.00 per request paid in advance by certified check or money order payable to Architect/Engineer.

1.8 SHOP DRAWINGS

A. Shop Drawings: Action Submittal: Submit to Architect/Engineer for assessing conformance with information given and design concept expressed in Contract Documents.

B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. When required by individual Specification Sections, provide Shop Drawings signed and sealed by a professional Engineer responsible for designing components shown on Shop Drawings.

1. Include signed and sealed calculations to support design.
2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
3. Make revisions and provide additional information when required by authorities having jurisdiction.

D. Submit in form of one reproducible transparency.

E. Submit electronic submittals via email as PDF electronic files.

F. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.9 SAMPLES

A. Samples: Action Submittal: Submit to Architect/Engineer for assessing conformance with information given and design concept expressed in Contract Documents.

B. Samples for Selection as Specified in Product Sections:

1. Submit to Architect/Engineer for aesthetic, color, and finish selection.
2. Submit Samples of finishes, textures, and patterns for Architect/Engineer selection.

C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.

D. Include identification on each Sample, with full Project information.

E. Submit number of Samples specified in individual Specification Sections; Architect/Engineer will retain one Sample.

F. Reviewed Samples that may be used in the Work are indicated in individual Specification Sections.

G. Samples will not be used for testing purposes unless specifically stated in Specification Section.

H. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.10 OTHER SUBMITTALS

A. Closeout Submittals: Comply with Section 017000 - Execution and Closeout Requirements.

B. Informational Submittal: Submit data for Architect/Engineer's knowledge as Contract administrator or for Owner.

C. Submit information for assessing conformance with information given and design concept expressed in Contract Documents.

1.11 TEST REPORTS

A. Informational Submittal: Submit reports for Architect/Engineer's knowledge as Contract administrator or for Owner.

B. Submit test reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.12 CERTIFICATES

A. Informational Submittal: Submit certification by manufacturer, installation/application Subcontractor, or Contractor to Architect/Engineer, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product but must be acceptable to Architect/Engineer.

1.13 MANUFACTURER'S INSTRUCTIONS

A. Informational Submittal: Submit manufacturer's installation instructions for Architect/Engineer's knowledge as Contract administrator or for Owner.

B. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to Architect/Engineer in quantities specified for Product Data.

C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.14 MANUFACTURER'S FIELD REPORTS

A. Informational Submittal: Submit reports for Architect/Engineer's knowledge as Contract administrator or for Owner.

B. Submit report within 5 days of observation to Architect/Engineer for information.

C. Submit reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.15 ERECTION DRAWINGS

A. Informational Submittal: Submit Drawings for Architect/Engineer's knowledge as Contract administrator or for Owner.

B. Submit Drawings for information assessing conformance with information given and design concept expressed in Contract Documents.

C. Data indicating inappropriate or unacceptable Work may be subject to action by Architect/Engineer or Owner.

1.16 CONSTRUCTION PHOTOGRAPHS

A. Provide photographs of Site and construction throughout progress of Work produced by an experienced photographer acceptable to Architect/Engineer.

B. Each month submit photographs with Application for Payment.

C. Photographs: Submit digitally.

D. Identify each print on back. Identify name of Project, orientation of view, date and time of view, name and address of photographer, and photographer's numbered identification of exposure.

E. Digital Images: Deliver complete set of digital image electronic files on CD-ROM to Owner with Project record documents. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as sensor, uncropped.

1. Digital Images: Uncompressed TIFF format, produced by digital camera with minimum sensor size of 4.0 megapixels, and image resolution of not less than 1024 by 768 pixels.
2. Date and Time: Include date and time in filename for each image.

1.17 CONTRACTOR REVIEW

A. Review for compliance with Contract Documents and approve submittals before transmitting to Architect.

B. Contractor: Responsible for:

1. Determination and verification of materials including manufacturer's catalog numbers.
2. Determination and verification of field measurements and field construction criteria.
3. Checking and coordinating information in submittal with requirements of Work and of Contract Documents.
4. Determination of accuracy and completeness of dimensions and quantities.
5. Confirmation and coordination of dimensions and field conditions at Site.

6. Construction means, techniques, sequences, and procedures.
7. Safety precautions.
8. Coordination and performance of Work of all trades.

C. Stamp, sign or initial, and date each submittal to certify compliance with requirements of Contract Documents.

D. Do not fabricate products or begin Work for which submittals are required until approved submittals have been received from Architect/Engineer.

1.18 ARCHITECT/ENGINEER REVIEW

A. Do not make "mass submittals" to Architect/Engineer. "Mass submittals" are defined as six or more submittals or items in one day or 15 or more submittals or items in one week. If "mass submittals" are received, Architect/Engineer's review time stated above will be extended as necessary to perform proper review. Architect/Engineer will review "mass submittals" based on priority determined by Architect/Engineer after consultation with Owner and Contractor.

B. Informational submittals and other similar data are for Architect/Engineer's information, do not require Architect/Engineer's responsive action, and will not be reviewed or returned with comment.

C. Submittals made by Contractor that are not required by Contract Documents may be returned without action.

D. Submittal approval does not authorize changes to Contract requirements unless accompanied by Change Order, Architect's Supplemental Instruction, or Construction Change Directive.

E. Owner may withhold monies due to Contractor to cover additional costs beyond the second submittal review.

F. Allow 15 days for submittal review by Architect/Engineer.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Quality control.

B. Tolerances.

C. References.

D. Labeling.

E. Mockup requirements.

F. Testing and inspection services.

G. Manufacturers' field services.

1.2 QUALITY CONTROL

A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.

B. Comply with specified standards as the minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

C. Perform Work using persons qualified to produce required and specified quality.

D. Products, materials, and equipment may be subject to inspection by Architect/Engineer and Owner at place of manufacture or fabrication. Such inspections shall not relieve Contractor of complying with requirements of Contract Documents.

E. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

1.3 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current as of date of Contract Documents except where specific date is established by code.

C. Obtain copies of standards and maintain on Site when required by product Specification Sections.

D. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

E. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of Architect/Engineer shall be altered from Contract Documents by mention or inference in reference documents.

1.5 LABELING

A. Attach label from agency approved by authorities having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.

B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label:

1. Model number.
2. Serial number.
3. Performance characteristics.

C. Manufacturer's Nameplates, Trademarks, Logos, and Other Identifying Marks on Products: Not allowed on surfaces exposed to view in public areas, interior or exterior.

1.6 MOCK-UP REQUIREMENTS

A. Tests will be performed under provisions identified in this Section and identified in individual product Specification Sections.

B. Assemble and erect specified or indicated items with specified or indicated attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mockups shall be comparison standard for remaining Work.

D. Where mockup has been accepted by Architect/Engineer and is specified in product Specification Sections to be removed, remove mockup and clear area when directed to do so by Architect/Engineer.

1.7 TESTING AND INSPECTION SERVICES

A. Owner will employ and pay for specified services of an independent firm to perform testing and inspection.

B. Independent firm will perform tests, inspections, and other services specified in individual Specification Sections and as required by Architect and authorities having jurisdiction.

1. Laboratory: Authorized to operate at Project location.
2. Laboratory Staff: Maintain full-time Professional Engineer on staff to review services.
3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.

C. Testing, inspections, and source quality control may occur on or off Project Site. Perform off-Site testing as required by Architect/Engineer or Owner.

D. Reports shall be submitted by independent firm to Architect/Engineer, Contractor, and authorities having jurisdiction, indicating observations and results of tests and compliance or noncompliance with Contract Documents.

1. Submit final report indicating correction of Work previously reported as noncompliant.

E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.

1. Notify Architect/Engineer and independent firm 24 hours before expected time for operations requiring services.
2. Make arrangements with independent firm and pay for additional Samples and tests required for Contractor's use.

F. Employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work according to requirements of Contract Documents.

G. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent firm on instructions from Architect/Engineer. Payment for retesting or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.

H. Agency Responsibilities:

1. Test Samples of mixes submitted by Contractor.
2. Provide qualified personnel at Site. Cooperate with Architect/Engineer and Contractor in performance of services.
3. Perform indicated sampling and testing of products according to specified standards.
4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. Promptly notify Architect/Engineer and Contractor of observed irregularities or nonconformance of Work or products.
6. Perform additional tests required by Architect/Engineer.
7. Attend preconstruction meetings and progress meetings.

I. Agency Reports: After each test, promptly submit two copies of report to Architect/Engineer, Contractor, and authorities having jurisdiction. When requested by Architect/Engineer, provide interpretation of test results. Include the following:

1. Date issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and Specification Section.
6. Location in Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Conformance with Contract Documents.

J. Limits on Testing Authority:

1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency or laboratory may not approve or accept any portion of the Work.
3. Agency or laboratory may not assume duties of Contractor.
4. Agency or laboratory has no authority to stop the Work.

1.8 MANUFACTURER'S FIELD SERVICES

A. When specified in individual Specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe Site conditions, conditions of surfaces and installation, quality of workmanship, startup of equipment, testing, adjusting, and balancing of equipment and commissioning as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect/Engineer 30 days in advance of required observations. Observer is subject to approval of Architect/Engineer.

C. Report observations and Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.

D. Refer to Section 013300 - Submittal Procedures, "Manufacturer's Field Reports" Article.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 014000

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Temporary facilities under Construction Agreement.

B. Temporary Utilities:

1. Temporary electricity.
2. Temporary lighting for construction purposes.
3. Temporary heating.
4. Temporary cooling.
5. Temporary ventilation.
6. Communication services.
7. Temporary water service.
8. Temporary sanitary facilities.

C. Construction Facilities:

1. Field offices and sheds.
2. Vehicular access.
3. Parking.
4. Progress cleaning and waste removal.
5. Project identification.
6. Traffic regulation.
7. Fire-prevention facilities.

D. Temporary Controls:

1. Barriers.
2. Enclosures and fencing.
3. Security.
4. Dust control.
5. Noise control.
6. Pest and rodent control.
7. Pollution control.

E. Removal of utilities, facilities, and controls.

1.2 REFERENCES

A. ASTM International:

1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

2. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
3. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.3 TEMPORARY FACILITIES UNDER CONSTRUCTION AGREEMENT

A. Temporary Provisions Provided by Contractor:

1. Temporary barriers, barricades, covered walkways, fencing, exterior closures, and interior closures.
2. Temporary field offices.
3. Cleaning during construction.
4. Access roads and approaches.
5. Temporary elevator.
6. Temporary sanitary facilities.
7. Temporary heating and ventilating after enclosure.
8. Temporary electrical service and distribution system for power and lighting.
9. Temporary telephone and internet service.
10. Construction aids.
11. Temporary fire protection, dust control, erosion and sediment control, water control, noise control, and other necessary temporary controls.
12. Temporary barriers, barricades, and similar devices as necessary for safety and protection of construction personnel and public.
13. On Construction Manager's approval, may provide temporary field office including electrical service and temporary telephone.
14. Temporary tree and plant protection.
15. Temporary heating before building enclosure.
16. Electrical service required in addition to temporary service and distribution provided by Construction Manager.
17. Temporary provisions for protection of installed Work.

1.4 TEMPORARY ELECTRICITY AND WATER RESTRICTIONS

A. Owner will make existing electricity and water available without usage charge solely to the extent existing services have adequate capacity. Contractor shall furnish all temporary distribution, metering, connections, backflow prevention, protection, maintenance, and removal. Contractor shall reimburse Owner for excessive, wasteful, unauthorized, or abnormal consumption, as reasonably determined by Owner.

B. Interruption or capacity limitation in an existing utility does not automatically create Contractor entitlement unless caused by the Owner.

1.5 TEMPORARY ELECTRICITY

A. Owner will pay cost of energy used as outlined above. Exercise measures to conserve energy. Use Owner's existing power service.

B. Provide temporary electric feeder from existing building electrical service at location as directed by Owner. Do not disrupt Owner's use of service.

C. Complement existing power service capacity and characteristics as required for construction operations.

D. Provide power outlets with branch wiring and distribution boxes located as required for construction operations. Provide suitable, flexible power cords as required for portable construction tools and equipment.

E. Provide main service disconnect and overcurrent protection at convenient location.

F. Permanent convenience receptacles may be used during construction.

G. Provide distribution equipment, wiring, and outlets for single-phase branch circuits for power and lighting.

1. Provide 20-ampere duplex outlets, single-phase circuits for power tools as required.
2. Provide 20-ampere, single-phase branch circuits for lighting.

1.6 TEMPORARY WATER SERVICE

A. Owner will pay cost of temporary water as outlined above. Exercise measures to conserve energy. Use Owner's existing water system, extended and supplemented with temporary devices as needed to maintain specified conditions for construction operations.

B. Extend branch piping with outlets located so that water is available by hoses with threaded connections. Provide temporary pipe insulation and heat tape to prevent freezing.

1.7 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain lighting for construction operations to achieve minimum lighting level of 2 watts/sq ft.

B. Provide and maintain 1 watt/sq ft lighting to exterior staging and storage areas after dark for security purposes.

C. Provide and maintain 0.25 watt/sq ft HID lighting to interior work areas after dark for security purposes.

D. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, lamps, and the like, for specified lighting levels.

E. Maintain lighting and provide routine repairs.

F. Permanent building lighting may be used during construction.

1.8 TEMPORARY HEATING

A. Provide and pay for heating devices and heat as needed to maintain specified conditions for construction operations.

B. Before operating permanent equipment for temporary heating purposes, verify installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts. Replace filters at Substantial Completion.

C. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress unless indicated otherwise in individual product Sections.

1.9 TEMPORARY COOLING

A. Provide and pay for cooling devices and cooling as needed to maintain specified conditions for construction operations.

B. Before operating permanent equipment for temporary cooling purposes, verify installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts. Replace filters at Substantial Completion.

C. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress unless indicated otherwise in individual product Sections.

1.10 TEMPORARY VENTILATION

A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

1.11 COMMUNICATION SERVICES

A. Telephone Service: Provide, maintain, and pay for telephone service to field office at time of Project mobilization and until completion of Work.

B. Internet Service: Provide, maintain, and pay for broadband Internet service to field office and Architect/Engineer's field office at time of Project mobilization. Provide desktop computer with Microsoft operating system and appropriate office function software, modem, and printer.

1.12 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide facilities at time of Project mobilization.

B. At end of construction, return existing facilities used for construction operations to same or better condition as original condition.

1.13 FIELD OFFICES AND SHEDS

A. Field Office: Weathertight, with lighting, electrical outlets, heating, cooling and ventilating equipment.

B. Provide space for Project meetings, with table and chairs to accommodate 12 persons.

C. Do not use permanent facilities for field offices or for storage.

D. Construction: Portable or mobile buildings, or buildings constructed with floors raised aboveground, securely fixed to foundations with steps and landings at entrance doors.

1. Construction: Structurally sound, secure, weathertight enclosures for office and storage spaces. Maintain during progress of Work; remove enclosures at completion of Work.
2. Thermal Resistance of Floors, Walls, and Ceilings: Compatible with occupancy and storage requirements.
3. Exterior Materials: Weather-resistant, finished in one color acceptable to Architect/Engineer.
4. Interior Materials in Field Offices: Sheet-type materials for walls and ceilings, prefinished or painted; resilient floors and bases.
5. Lighting for Field Offices: 50 ft-C at desktop height; exterior lighting at entrance doors.
6. Interior Materials in Storage Sheds: As required to provide specified conditions for storage of products.

E. Environmental Control:

1. Heating, Cooling, and Ventilating for Offices: Automatic equipment to maintain comfort conditions.
2. Storage Spaces: Heating and ventilating as needed to maintain products according to Contract Documents; lighting for maintenance and inspection of products.

F. Storage Areas and Sheds: Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and inspection of products to suit requirements in Section 016000 - Product Requirements.

G. Preparation: Fill and grade Sites for temporary structures sloped for drainage away from buildings.

H. Installation:

1. Install field office spaces ready for occupancy 15 days after date established by Owner-Contractor Agreement.
2. Employee Residential Occupancy: Not allowed on Owner's property.

I. Maintenance and Cleaning:

1. Daily janitorial services for field offices; periodic cleaning and maintenance for sheds and storage areas.
2. Maintain walks free of mud, water, snow, and the like.

J. Removal: At completion of Work remove buildings, foundations, utility services, and debris. Restore areas to same or better condition as original condition.

1.14 VEHICULAR ACCESS

A. Access to site shall be as directed by Owner.

B. Provide unimpeded access for emergency vehicles. Maintain 20 foot-wide driveways with turning space between and around combustible materials.

1.15 PARKING

A. Park in Owner approved existing parking lot.

B. Locate as approved by Owner.

C. If Site space is not adequate, provide additional off-Site parking.

D. Use of designated areas of existing on-Site streets and driveways used for construction traffic is not permitted. Tracked vehicles are not allowed on paved areas.

E. Use of designated areas of existing parking facilities is not permitted.

F. Do not allow heavy vehicles or construction equipment in parking areas.

1.16 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, before enclosing spaces.

C. Broom and vacuum clean interior areas before starting surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and rubbish from Site weekly and dispose of off-Site.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.17 PROJECT IDENTIFICATION

A. Project Identification Sign:

1. One painted sign (8ft x 8ft) of construction, design, and content shown on Drawings, location designated.

2. Content:

    a. Project title, logo, and name of Owner.
    b. Names and titles of authorities.
    c. Names and titles of Architect/Engineer and Consultants.
    d. Name of Prime Contractor and major Subcontractors.

3. Graphic Design, Colors, and Style of Lettering: Designated by Architect/Engineer.

B. Project Informational Signs:

1. Painted informational signs of same colors and lettering as Project identification sign or standard products; size lettering for legibility at 100-foot distance.
2. Provide sign at each field office and storage shed, and provide directional signs to direct traffic into and within Site. Relocate as Work progress requires.
3. Provide municipal traffic agency directional traffic signs to and within Site.
4. No other signs are allowed without Owner's permission except those required by law.

C. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

D. Maintenance: Maintain clean signs and supports; repair deterioration and damage.

E. Removal: Remove signs, framing, supports, and foundations at completion of Project and restore area.

1.18 TRAFFIC REGULATION

A. Signs, Signals, and Devices:

1. Post-Mounted and Wall-Mounted Traffic Control and Informational Signs: To be provided by Contractor to maintain adequate hospital campus traffic flow, as approved by Owner. This is to include 3 digital traffic control signs to be operated 24 hours a day.
2. Traffic Control Signals: To be provided by Contractor to maintain adequate hospital campus traffic flow, as approved by Owner. This is to include 3 digital traffic control signs to be operated 24 hours a day.
3. Traffic Cones, Drums, Flares, and Lights: To be provided by Contractor to maintain adequate hospital campus traffic flow, as approved by Owner. This is to include 3 digital traffic control signs to be operated 24 hours a day.
4. Flag Person Equipment: To be provided by Contractor to maintain adequate hospital campus traffic flow, as approved by Owner.

B. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

C. Flares and Lights: Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

D. Haul Routes:

1. Consult with Owner and establish public thoroughfares to be used for haul routes and Site access.
2. Drawings indicate haul routes designated by Owner for use by construction traffic.
3. Confine construction traffic to designated haul routes.
4. Provide traffic control at critical areas of haul routes to regulate traffic and to minimize interference with public traffic.

E. Traffic Signs and Signals:

1. Provide signs at approaches to Site and on Site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
2. Provide, operate, and maintain automatic traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control and areas affected by Contractor's operations.
3. Relocate signs and signals as Work progresses, to maintain effective traffic control.

F. Removal:

1. Remove equipment and devices when no longer required.
2. Repair damage caused by installation.
3. Remove post settings to depth of 2 feet.

1.19 FIRE-PREVENTION FACILITIES

A. Prohibit smoking within buildings under construction and demolition. Designate area on Site where smoking is permitted. Provide approved ashtrays in designated smoking areas.

B. Establish fire watch for cutting, welding, and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.

C. Portable Fire Extinguishers: NFPA 10; 10-pound capacity, 4A-60B: C UL rating.

1. Provide one fire extinguisher at each stairway on each floor of buildings under construction.
2. Provide minimum of one fire extinguisher in every construction trailer and storage shed.
3. Provide minimum of one fire extinguisher on roof during roofing operations using heat-producing equipment.

1.20 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas , to allow for Owner's use of Site, and to protect existing facilities and adjacent properties from damage from construction operations.

B. Provide barricades and covered walkways required by authorities having jurisdiction for public rights-of-way and for public access to existing building.

C. Protect non-owned vehicular traffic, stored materials, Site, and structures from damage.

1.21 ENCLOSURES AND FENCING

A. Construction: Commercial-grade chain-link fence with fabric mesh and weighted supports. Integral colored fabric mesh to be printed to include hospital logo, contractor logo, and architect logo. Ensure that sufficient holes for wind relief are located in fabric mesh.

B. Provide 6-foot-high fence around construction Site; equip with vehicular and pedestrian gates with locks.

C. Exterior Enclosures:

1. Provide temporary insulated weathertight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual Specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.22 SECURITY

A. Security Program:

1. Protect Work on existing premises from theft, vandalism, and unauthorized entry.
2. Initiate program in coordination with Owner's existing security system at Project mobilization.
3. Maintain program throughout construction period until Owner occupancy.

B. Entry Control:

1. Restrict entrance of persons and vehicles to Project Site and existing facilities.
2. Allow entrance only to authorized persons with proper identification.
3. Coordinate access of Owner's personnel to Site in coordination with Owner's security forces.

C. Personnel Identification:

1. Provide identification badge for each person authorized to enter premises.
2. Badge to Include: Personal photograph, name, expiration date, and employer.
3. Maintain list of accredited persons and submit copy to Owner on request.
4. Require return of badges at expiration of employment on the Work.

D. Restrictions:

1. Do not allow cameras on Site or photographs taken except by written approval of Owner.

1.23 DUST CONTROL

A. Execute Work by methods that minimize raising dust from construction operations.

1.24 NOISE CONTROL

A. Provide methods, means, and facilities to minimize noise from construction operations.

1.25 PEST AND RODENT CONTROL

A. Provide methods, means, and facilities to prevent pests and insects from damaging the Work.

B. Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.26 POLLUTION CONTROL

A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.

B. Comply with pollution and environmental control requirements of authorities having jurisdiction.

1.27 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, and materials before Substantial Completion inspection.

B. Clean and repair damage caused by installation or use of temporary Work.

C. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Products.

B. Product delivery requirements.

C. Product storage and handling requirements.

D. Product options.

1.2 PRODUCTS

A. At minimum, comply with specified requirements and reference standards.

B. Specified products define standard of quality, type, function, dimension, appearance, and performance required.

C. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.

D. Do not use materials and equipment removed from existing premises except as specifically permitted by Contract Documents.

E. Furnish interchangeable components from same manufacturer for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

A. Comply with delivery requirements in Section 017419 - Construction Waste Management and Disposal.

B. Transport and handle products according to manufacturer's instructions.

C. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.

D. Provide equipment and personnel to handle products; use methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

A. Store and protect products according to manufacturer's instructions.

B. Store products with seals and labels intact and legible.

C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.

D. For exterior storage of fabricated products, place products on sloped supports aboveground.

E. Provide bonded off-Site storage and protection when Site does not permit on-Site storage or protection.

F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.

H. Provide equipment and personnel to store products; use methods to prevent soiling, disfigurement, or damage.

I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Products complying with specified reference standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and complying with Specifications; no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit Request for Substitution for any manufacturer not named, according to Section 012500 - Substitution Procedures.

PART 2 - PRODUCTS

PART 3 - EXECUTION - Not Used

END OF SECTION 016000

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Examination.

B. Preparation.

C. Coordination of Owner's portion of the Work.

D. Execution.

E. Cutting and patching.

F. Protecting installed construction.

G. Starting of systems.

H. Demonstration and instruction.

I. Testing, adjusting, and balancing.

J. Closeout procedures.

K. Project record documents.

L. Operation and maintenance data.

M. Manual for materials and finishes.

N. Manual for equipment and systems.

O. Spare parts and maintenance products.

P. Product warranties and product bonds.

Q. Maintenance service.

R. Final cleaning.

1.2 EXAMINATION

A. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual Specification Sections.

D. Verify that utility services are available with correct characteristics and in correct locations.

1.3 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance according to manufacturer's instructions.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer-required or -recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

1.4 COORDINATION OF OWNER'S PORTION OF THE WORK

A. Site Access: Provide access to Project site for Owner's construction personnel.

1. Provide temporary facilities required for Owner-furnished, Contractor-installed and Owner-furnished, Owner-installed products.
2. Refer to Section 011000 - Summary for other requirements for Owner-furnished, Contractor-installed and Owner-furnished, Owner-installed products.

B. Coordination: Coordinate construction and operations of the Work with Work performed by Owner's construction personnel and Owner's separate Contractors.

1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction personnel and Owner's separate Contractors at preinstallation conferences covering portions of the Work that are to receive Owner's Work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

1.5 EXECUTION

A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

C. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.

D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
2. Physically separate products in place and provide electrical insulation or protective coatings to prevent galvanic action or corrosion between dissimilar metals.
3. Exposed Joints: Provide uniform joint width and arrange to obtain best visual effect. Refer questionable visual effect choices to Architect/Engineer for final decision.

E. Allow for expansion of materials and building movement.

F. Climatic Conditions and Project Status: Install each unit of Work under conditions to ensure best possible results in coordination with entire Project.

1. Isolate each unit of Work from incompatible Work as necessary to prevent deterioration.
2. Coordinate enclosure of Work with required inspections and tests to minimize necessity of uncovering Work for those purposes.

G. Mounting Heights: Where not indicated, mount individual units of Work at industry-recognized standard mounting heights for particular application indicated.

1. Refer questionable mounting height choices to Architect/Engineer for final decision.
2. Elements Identified as Handicap Accessible: Comply with applicable codes and regulations.

H. Adjust operating products and equipment to ensure smooth and unhindered operation.

I. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

1.6 CUTTING AND PATCHING

A. Employ skilled and experienced Installers to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements affecting the following:

1. Structural integrity of element.
2. Integrity of weather-exposed or moisture-resistant elements.
3. Efficiency, maintenance, or safety of element.
4. Visual qualities of sight-exposed elements.
5. Work of Owner or separate Contractor.

C. Execute cutting, fitting, and patching to complete Work and to accomplish the following:

1. Fit the several parts together, to integrate with other Work.
2. Uncover Work to install or correct ill-timed Work.
3. Remove and replace defective and nonconforming Work.
4. Remove samples of installed Work for testing.

5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Execute Work by methods to avoid damage to other Work and to provide proper surfaces to receive patching and finishing.

E. Cut masonry and concrete materials using masonry saw or core drill.

F. Restore Work with new products according to requirements of Contract Documents.

G. Fit Work tight to pipes, sleeves, ducts, conduits, and other penetrations through surfaces.

H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

I. At penetrations of fire-rated walls, partitions, ceiling, or floor construction, completely seal voids with fire-rated material to full thickness of penetrated element according to Section 078400 - Firestopping.

J. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.

K. Identify the hazardous substances or conditions exposed during the Work to Architect/Engineer for decision or remedy.

1.7 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual Specification Sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Use durable sheet materials to protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

1.8 STARTING OF SYSTEMS

A. Coordinate schedule for startup of various equipment and systems.

B. Notify Architect/Engineer and Owner seven days prior to startup of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

D. Verify that tests, meter readings, and electrical characteristics agree with those required by equipment or system manufacturer.

E. Verify that wiring and support components for equipment are complete and tested.

F. Execute startup under supervision of manufacturer's representative or Contractors' personnel according to manufacturer's instructions.

G. When specified in individual Specification Sections, require manufacturer to provide authorized representative who will be present at Site to inspect, check, and approve equipment or system installation prior to startup and will supervise placing equipment or system in operation.

H. Submit a written report in accordance with Section 013300 - Submittal Procedures stating that equipment or system has been properly installed and is functioning correctly.

1.9 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

B. Demonstrate Project equipment and instruct in classroom environment located at Project Site and instructed by qualified manufacturer's representative who is knowledgeable about the Project.

C. Video Recordings: Provide high-quality color video recordings of demonstration and instructional sessions. Engage commercial videographer to record sessions. Include classroom instructions, demonstrations, board diagrams, and other visual aids. Include menu navigation.

D. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

E. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

F. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at equipment location.

G. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

H. Allot the required instruction time for each item of equipment and system as specified in individual Specification Sections.

1.10 TESTING, ADJUSTING, AND BALANCING

A. Owner will appoint, employ, and pay for services of independent firm to perform testing, adjusting, and balancing.

B. Independent firm will perform services specified in Section 230593 - Testing, Adjusting, and Balancing for HVAC.

C. Reports will be submitted by independent firm to Architect/Engineer indicating observations, test results, and compliance or noncompliance with requirements of Contract Documents.

1.11 CLOSEOUT PROCEDURES

A. Prerequisites to Substantial Completion: Complete following items before requesting Certification of Substantial Completion, either for entire Work or for portions of Work:

1. Submit maintenance manuals, Project record documents, digital images of construction photographs, and other similar final record data in compliance with this Section.
2. Complete facility startup, testing, adjusting, balancing of systems and equipment, demonstrations, and instructions to Owner's operating and maintenance personnel as specified in compliance with this Section.
3. Conduct inspection to establish basis for request that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to be completed or corrected, value of incomplete or nonconforming Work, reason for being incomplete, and date of anticipated completion for each item. Include copy of list with request for Certificate of Substantial Completion.
4. Obtain and submit releases enabling Owner's full, unrestricted use of Project and access to services and utilities. Include certificate of occupancy, operating certificates, and similar releases from authorities having jurisdiction and utility companies.
5. Deliver tools, spare parts, extra stocks of material, and similar physical items to Owner.
6. Make final change-over of locks eliminating construction master-key system and transmit keys directly to Owner. Advise Owner's personnel of change-over in security provisions.
7. Discontinue or change over and remove temporary facilities and services from Project Site, along with construction tools, mockups, and similar elements.
8. Perform final cleaning according to this Section.

B. Substantial Completion Inspection:

1. When Contractor considers Work to be substantially complete, submit to Architect:

    a. Written certificate that Work, or designated portion, is substantially complete.
    b. List of items to be completed or corrected (initial punch list).

2. Within seven days after receipt of request for Substantial Completion, Architect will make inspection to determine whether Work or designated portion is substantially complete.
3. Should Architect determine that Work is not substantially complete:

    a. Architect will promptly notify Contractor in writing, stating reasons for its opinion.
    b. Contractor shall remedy deficiencies in Work and send second written request for Substantial Completion to Architect.
    c. Architect will reinspect Work.
    d. Redo and Inspection of Deficient Work: Repeated until Work passes Architect’s inspection.

4. When Architect finds that Work is substantially complete, Architect will:

    a. Prepare Certificate of Substantial Completion on AIA G704 - Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified and amended by Architect/Engineer and Owner (final punch list).
    b. Submit Certificate to Owner and Contractor for their written acceptance of responsibilities assigned to them in Certificate.

5. After Work is substantially complete, Contractor shall:

    a. Allow Owner occupancy of Project under provisions stated in Certificate of Substantial Completion.
    b. Complete Work listed for completion or correction within time period stipulated.

6. Owner will occupy all of building as specified in Section 011000 - Summary.

C. Prerequisites for Final Completion: Complete following items before requesting final acceptance and final payment.

1. When Contractor considers Work to be complete, submit written certification that:

    a. Contract Documents have been reviewed.
    b. Work has been examined for compliance with Contract Documents.
    c. Work has been completed according to Contract Documents.
    d. Work is completed and ready for final inspection.

2. Submittals: Submit following:

    a. Final punch list indicating all items have been completed or corrected.
    b. Final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
    c. Specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
    d. Accounting statement for final changes to Contract Sum.
    e. Contractor's affidavit of payment of debts and claims on AIA G706 - Contractor's Affidavit of Payment of Debts and Claims.
    f. Contractor affidavit of release of liens on AIA G706A - Contractor's Affidavit of Release of Liens.
    g. Consent of surety to final payment on AIA G707 - Consent of Surety to Final Payment Form.
    h. Clear Lien certificate from Clerk of Court.

3. Perform final cleaning for Contractor-soiled areas according to this Section.

D. Final Completion Inspection:

1. Within seven days after receipt of request for final inspection, Architect will make inspection to determine whether Work or designated portion is complete.
2. Should Architect consider Work to be incomplete or defective:

a. Architect will promptly notify Contractor in writing, listing incomplete or defective Work.
b. Contractor shall remedy stated deficiencies and send second written request to Architect that Work is complete.
c. Architect will reinspect Work.
d. Redo and Inspection of Deficient Work: Repeated until Work passes Architect's inspection.

1.12 PROJECT RECORD DOCUMENTS

A. Maintain on Site one set of the following record documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed Shop Drawings, product data, and Samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress, not less than weekly.

E. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including the following:

1. Manufacturer's name and product model and number.
2. Product substitutions or alternates used.
3. Changes made by Addenda, bulletin, Change Order, and modifications.

F. Record Drawings: Legibly mark each item to record actual construction as follows:

1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
2. Include locations of concealed elements of the Work.
3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
4. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
5. Identify and locate existing buried or concealed items encountered during Project.
6. Measured depths of foundations in relation to finish first floor datum.
7. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
8. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
9. Field changes of dimension and detail.
10. Details not on original Drawings.

G. Submit marked-up paper copy documents to Architect/Engineer with claim for final Application for Payment.

H. Submit PDF electronic files of marked-up documents to Architect/Engineer with claim for final Application for Payment.

1.13 OPERATION AND MAINTENANCE DATA

A. Submit in PDF composite electronic indexed file.

B. Submit data bound in 8-1/2 x 11-inch text pages, three D side ring binders with durable plastic covers.

C. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of Project, and subject matter of binder when multiple binders are required.

D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

F. Contents: Prepare table of contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.
2. Part 2: Operation and maintenance instructions, arranged by system process flow and subdivided by Specification Section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Include the following:

    a. Significant design criteria.
    b. List of equipment.
    c. Parts list for each component.
    d. Operating instructions.
    e. Maintenance instructions for equipment and systems.
    f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
    g. Safety precautions to be taken when operating and maintaining or working near equipment.

3. Part 3: Project documents and certificates, including the following:

    a. Shop Drawings and product data.
    b. Air and water balance reports.
    c. Certificates.
    d. Originals of warranties.

1.14 MANUAL FOR MATERIALS AND FINISHES

A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.

B. For equipment or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.

C. Submit one copy of completed volumes 15 days prior to final inspection. Completed volumes, with Architect/Engineer comments, will be returned after final inspection. Revise content of document sets as required prior to final submission.

D. Submit two sets of revised final volumes within 10 days after final inspection.

E. Submit in PDF composite electronic indexed file of final volumes within 10 days after final inspection.

F. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations.

G. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

H. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.

I. Additional Requirements: As specified in individual product Specification Sections.

J. Include listing in table of contents for design data, with tabbed fly sheet and space for insertion of data.

1.15 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.

B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.

C. Submit one copy of completed volumes 15 days prior to final inspection. Completed volumes, with Architect/Engineer comments, will be returned after final inspection. Revise content of document sets as required prior to final submission.

D. Submit two sets of revised final volumes within ten days after final inspection.

E. Submit in PDF composite electronic indexed file of final volumes within ten days after final inspection.

F. Equipment and Systems: Include description of unit or system and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.

G. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; by label machine.

H. Include color-coded wiring diagrams as installed.

I. Operating Procedures: Include startup, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and special operating instructions.

J. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

K. Include servicing and lubrication schedule and list of lubricants required.

L. Include manufacturer's printed operation and maintenance instructions.

M. Include sequence of operation by controls manufacturer.

N. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

O. Include control diagrams by controls manufacturer as installed.

P. Include Contractor's coordination drawings indicating installed color-coded piping diagrams.

Q. Include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

R. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

S. Include test and balancing reports as specified in Section 014000 - Quality Requirements.

T. Additional Requirements: As specified in individual product Specification Sections.

U. Include listing in table of contents for design data with tabbed dividers and space for insertion of data.

1.16 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Furnish spare parts, maintenance, and extra products in quantities specified in individual Specification Sections.

B. Deliver to Project Site; obtain receipt prior to final payment.

1.17 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Obtain warranties and bonds executed in duplicate by responsible Subcontractors, suppliers, and manufacturers within ten days after completion of applicable item of Work.

B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.

C. Verify documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals when required.

E. Include table of contents and assemble in three D side ring binder with durable plastic cover.

F. Submit prior to final Application for Payment.

G. Time of Submittals:

1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
2. Make other submittals within ten days after date of Substantial Completion, prior to final Application for Payment.
3. For items of Work for which acceptance is delayed beyond Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.18 MAINTENANCE SERVICE

A. Furnish service and maintenance of components indicated in Specification Sections during warranty period.

B. Examine system components at frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by manufacturer of original component.

D. Do not assign or transfer maintenance service to agent or Subcontractor without prior written consent of Owner.

1.19 FINAL CLEANING

A. Execute final cleaning prior to final Project assessment.

1. Employ experienced personnel or professional cleaning firm.

B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces; and vacuum carpeted and soft surfaces.

C. Clean equipment and fixtures to sanitary condition with appropriate cleaning materials.

D. Replace filters of operating equipment.

E. Clean debris from roofs, gutters, downspouts, and drainage systems.

F. Clean Site; sweep paved areas, rake clean landscaped surfaces.

G. Remove waste and surplus materials, rubbish, and construction facilities from Site.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 017000

DIVISION 02

EXISTING CONDITIONS

NOHS Parking Garage Revision 1

Geotechnical Engineering Report

Hammond, Louisiana

August 27, 2026 | Terracon Project No. 1000027988

Prepared for:

North Oaks Health System
15790 Paul Vega, MD, Dr.
Hammond, LA 70403



Terracon
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August 27, 2026

North Oaks Health System
15790 Paul Vega, MD, Dr.
Hammond, LA 70403

Attn: Michele K. Sutton
P: 985-345-2700
E: suttonm@northoaks.org

Re: Geotechnical Engineering Report
NOHS Parking Garage Revision 1
15837 Paul Vega MD Dr
Hammond, Louisiana
Terracon Project No. 1000027988

Dear Ms. Sutton:

We have completed the scope of Geotechnical Engineering services for the above referenced project in general accordance with Terracon Proposal No. 1000015910 dated July 1, 2026. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slabs and pavements for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon



Ryan Poindexter, P.E.
Project Engineer

Albert Y. Ayenu-Prah, Jr., Ph.D., P.E.
Senior Engineer

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Site Location and Exploration Plans

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Note: This report was originally delivered in a web-based format. **Blue Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the terracon logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the proposed building and pavement to be located at 15837 Paul Vega MD Dr in Hammond, Louisiana. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Seismic site classification per IBC
- Site preparation and earthwork
- Foundation design and construction
- Floor slab design and construction
- Lateral earth pressure
- Pavement design and construction

The geotechnical engineering Scope of Services for this project included the advancement of test borings, laboratory testing, engineering analysis, and preparation of this report.

Drawings showing the site and boring locations are shown on the **Site Location** and **Exploration Plan**, respectively. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs and as separate graphs in the **Exploration and Laboratory Results** section.

Project Description

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	An email request for proposal was provided by Micheal Watkins on June 9th, 2026. The request included a Parcel Map and conceptual plan drawings of the layout of the planned development with proposed borings.
Project Description	The project includes the construction of a multi-story parking garage adjacent to a medical plaza.

Item	Description
Proposed Structure	Structures associated with the project include an approximately 50,000 square foot footprint parking garage.
Building Construction	Cast in place and supported by the grade.
Finished Floor Elevation	Not provided; boring depths have assumed that finished floor is not more than 2 feet above existing grade.
Maximum Loads	Anticipated structural column loads were provided by Ryan LeBouef from Wardlaw, Lasseigne, & LeBouef LLC. Columns ▪ 3 Story: 600kips ▪ 4 Story: 900kips ▪ 5 Story: 1,200kips ▪ Walls: 3 kips per linear foot (klf) ▪ Slabs: 150 pounds per square foot (psf)
Grading/Slopes	Proposed finished grade elevation for the building pad is expected to be near existing grade. It is assumed approximately 1 foot of cut and 1 foot of fill will be required to develop final grade, excluding remedial grading requirements.

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading limits, as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

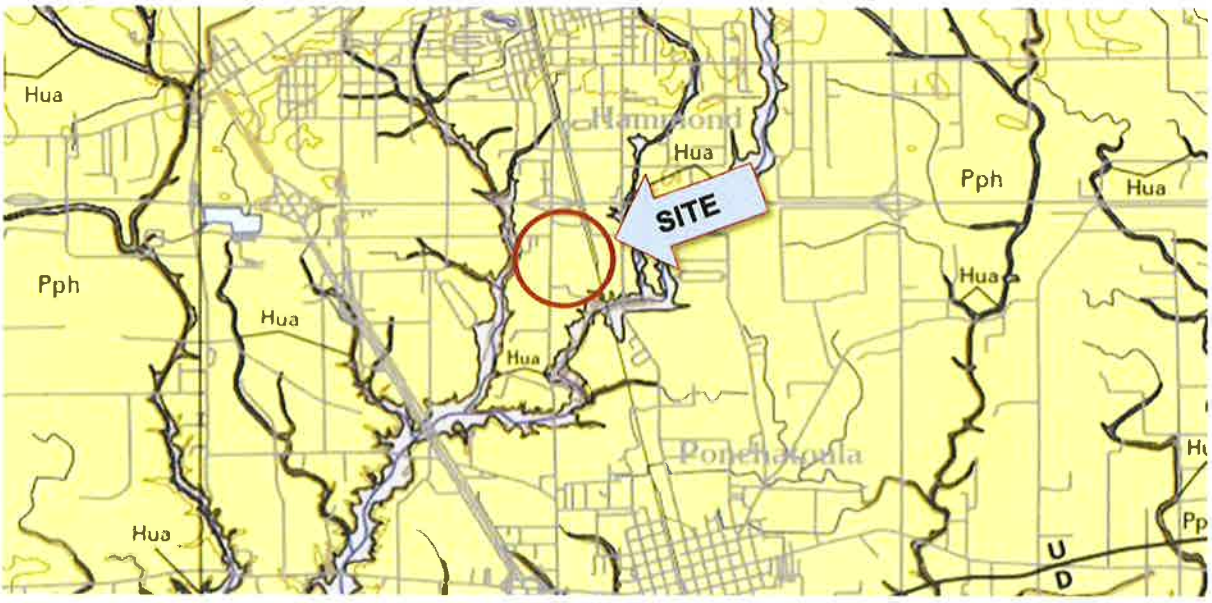
Item	Description
Parcel Information	The project is located at 15837 Paul Vega MD Dr in Hammond, Louisiana. Latitude/Longitude (approximate): 30.4679°, -90.4605° See **Site Location**
Existing Improvements	Existing parking lot adjacent to an existing parking garage and medical plaza.
Current Ground Cover	Concrete pavement with trees and other foliage spaced throughout the project area.

Item	Description
Existing Topography	Relatively flat.

Geotechnical Characterization

Surface Geology

The project site is located within the Pleistocene Prairie Allogroup, Early Sangamon – Hammond Alloformation. This consists of deposits of middle to late Wisconsin Coastal Plain streams, blanketed by Peoria Loess, in the Florida Parishes of southeastern Louisiana. Includes flood plain deposits of the late Pleistocene Mississippi River, exposed in the eastern valley wall of the modern Mississippi River alluvial valley, originally defined as the Mt. Pleasant Bluff Alloformation. Within the western part of the Ponchatoula 100K geologic quadrangle, its constructional topography lies hidden beneath a layer of Peoria Loess. It is composed of coastal plain deposits of late to middle Pleistocene streams.



Ponchatoula 30x60 Minute Geologic Quadrangle (Louisiana Geological Survey, 2003)

Subsurface Conditions

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of

our geotechnical calculations and evaluation of the site. Conditions observed at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration and Laboratory Results** and the GeoModel can be found in the **Figures** attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
01	Upper Silts	Brown and gray silts
02	Upper Clay	Brown, very stiff to stiff silts and clays with sand seams
03	Upper Sand	Dense sand
04	Middle Clay	Very stiff clay and sandy clay
05	Soft Clay	Soft to medium stiff clay
06	Lower Sand	Very dense sand

The borings were advanced using a flight auger drilling technique that allow short term groundwater observations to be made while drilling. Groundwater seepage was not encountered during drilling at the time of our field exploration. Based on observed pore water pressures in the CPT soundings, groundwater appeared to be present starting at approximately 23 to 25 feet below existing ground services. Groundwater conditions may be different at the time of construction. Groundwater conditions may change because of seasonal variations in rainfall, runoff, river levels and other conditions not apparent at the time of drilling. Long-term groundwater monitoring was outside the scope of services for this project.

Geologic Hazards

Due to the low seismicity in the region and absence of soils prone to liquefaction, such as loose sands, the soils at the site are not considered a risk for liquefaction.

Seismic Site Class

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard

penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7-16 and the International Building Code (IBC 2021). Based on the soil properties observed at the site and as described on the exploration logs and results, our professional opinion is that a **Seismic Site Classification of D** be considered for the project. Subsurface explorations at this site were extended to a maximum depth of 80 feet. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area. Although not considered essential, additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth.

Geotechnical Overview

The site appears suitable for the proposed construction based upon geotechnical conditions encountered in the test borings, provided that the recommendations provided in this report are implemented in the design and construction phases of this project.

The subsurface materials generally consisted of medium stiff to stiff lean clays over stiff to very stiff fat clays. Groundwater was not encountered during drilling.

The surface soils appeared relatively stable at the time of the exploration. However, the clays could become unstable with typical earthwork and construction traffic, especially after precipitation events. Effective drainage should be completed early in the construction sequence and maintained after construction to reduce potential issues. At project sites with minimal grade change and with developments and roads surrounding the construction area, such as the existing parking lot, it can be difficult to maintain positive drainage throughout the construction phase. The construction phase drainage should be considered in the development of the project overall grading and drainage plan. The possible poor drainage conditions can lead to instability in the areas around the site and hamper construction progress. A temporary dewatering system of sumps and pumps could be necessary to remove ponding water where positive drainage is not feasible.

If possible, the grading should be performed during the warmer and drier times of the year. If grading is performed during the wetter months, an increased risk for possible undercutting and replacement of unstable subgrade will persist. Initial processing and drying of the upper native soils is anticipated in some areas to achieve suitable stability for subsequent fill placement. It may be prudent to consider specifying chemical treatment of critical project access roads and construction laydown areas as part of the construction package to reduce potential weather-related delays. A budget for undercut and replacement of possible unstable surficial silt soils should be included in the project. Additional recommendations should be provided by the Geotechnical Engineer based on conditions noted at the time of site preparation. Additional site preparation recommendations, including proofrolling, subgrade improvement and fill placement, are provided in the **Earthwork** section.

Due to the high column loads of the planned structures, a drilled shaft foundation or Auger Cast-in-Place (ACIP) pile system is recommended. The **Deep Foundations** section addresses support of the building on drilled shafts or ACIP piles.

Our opinion of pavement section thickness design has been developed based on our understanding of the intended use, assumed traffic, and subgrade preparation recommended herein using methodology contained in NAPA IS-109 "Design of Hot Mix Asphalt Pavements" or ACI 330 "Guide to Design and Construction of Concrete Parking Lots" and adjusted with consideration to LADOTD Louisiana State Specification for Roads and Bridges (LSSRB 2016). The **Pavements** section includes minimum pavement component thickness.

The recommendations contained in this report are based upon the results of field and laboratory testing (presented in the **Exploration and Laboratory Results**), engineering analyses, and our current understanding of the proposed project. The **General Comments** section provides an understanding of the report limitations.

Earthwork

Earthwork is anticipated to include demolition of existing structures/pavements, clearing and grubbing, excavations, and structural fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

Demolition

The proposed building will be constructed within the footprint of the existing building which will need to be demolished, as well as exterior sidewalks, pavements, and utilities. We recommend existing foundations, slabs, and utilities be removed from within the proposed building footprint and at least 5 feet beyond the outer edge of foundations.

For areas outside the proposed building footprints and foundation bearing zones, the existing foundations, floor slabs, and utilities should be removed where they conflict with proposed utilities, retaining walls, or pavements. In such cases, existing foundations, floor slabs, and utilities should be removed up to a depth of at least 2 feet below the affected utility or design pavement subgrade elevation and the subgrade tested for stability.

Site Preparation

Prior to placing fill, the existing vegetation, topsoil, root mats and loose, soft or otherwise unsuitable material should be removed. Complete stripping of the topsoil should be performed in the proposed building and parking/driveway areas. Topsoil measurements were made at the boring locations; however, stripping depths between our boring locations and across the site could vary considerably. As such we recommend actual stripping depths be evaluated by a representative of Terracon during construction to aid in preventing removal of excess material.

Subgrade Preparation

After stripping the site, the subgrade should be proofrolled with an adequately loaded rubber tire vehicle such as a partially-loaded tandem-axle dump truck or loaded scraper. The vehicle should weigh between 15 and 20 Tons (total vehicle weight). The proofrolling should be performed under the observation of the Geotechnical Engineer or representative. Areas excessively deflecting under the proofroll should be delineated and subsequently addressed by the Geotechnical Engineer. It is not unusual to find soft and wet soils immediately beneath existing pavements and slabs. If unstable subgrade is encountered after initial topsoil stripping, mitigation should be performed as described in the **Soil Stabilization** section. Unstable, isolated areas could either be removed or modified by treating with lime or cement as specified by the Geotechnical Engineer at the time of construction. Excessively wet or dry material should either be removed or moisture conditioned and recompacted.

Soil Stabilization

Once exposed, the existing silt and clay subgrade soils have the potential to become unstable with typical construction activities. Methods of subgrade improvement, as described below, could include scarification, drying and recompaction, chemical stabilization or removal of unstable materials and replacement with structural fill. The appropriate method of improvement, if required, would be dependent on factors such as schedule, weather, availability and costs of materials, the size of area to be stabilized, and the nature of the instability. More detailed recommendations can be provided during construction as the need for subgrade stabilization occurs. Performing site grading operations during warm seasons and dry periods would help reduce the amount of subgrade stabilization required.

If the exposed subgrade is unstable during proofrolling operations, it could be stabilized using one of the methods outlined below.

- **Scarification and Recompaction** - It may be feasible to scarify, dry, and recompact the exposed lean clay soils in unstable areas that were observed

during proofrolling. The upper maximum 12 inches of native subgrade should be processed by frequent windrowing with a dozer or plowing with a set of heavy duty disc harrows for at least three working days to achieve stable conditions for fill placement before consideration of other mitigation approaches. The windrowing and drying effort should be performed during a period with at least two days forecasted to be dry. The processed areas should be sealed with the dozer at the end of the day in case of overnight rain. Stabilizing subgrades by drying likely would not be achievable if the thickness of the unstable soil is greater than about 1 to 2 feet, if the unstable soil is at groundwater levels, or if construction is performed during a period of wet or cool weather when drying is difficult.

- **Chemical Treatment** – For higher plasticity or wet, unstable surficial soils, it may be prudent to consider specifying chemical treatment of critical project access roads, building pads and construction laydown areas as part of the construction package to reduce potential weather-related delays. For the typical near surface lean clay soils at this site, treatment of the subgrade with minimum 6% quick lime or 6% hydrated lime by volume to a depth of 12 inches should provide for a more weather resistant subgrade of these critical areas during the construction phase. The hazards of airborne particles during mixing blowing across the site or onto adjacent property should be considered. Additional testing could be needed to develop specific recommendations on determining the most suitable stabilizing agent and optimum amounts required to improve subgrade stability by blending with the site soils.
- **Undercut and Replacement** – The surficial soils consist of low plasticity lean clay and non-plastic silt to around 2 feet below grade. Even though the subgrade appeared relatively stable during the subsurface exploration, repetitive construction traffic over the on-site surficial soil will likely lead to softening and disturbance of the exposed native subgrade. Additionally, this material has a narrow range of moisture contents where sufficient levels of compaction with stability can be achieved and then sustained during the compaction of the fill above. Even though leaving this material in place or reworking is possible and should be considered, an undercut and replacement or cement treatment of building pads, critical project access roads and construction laydown areas should be budgeted as an alternative in the construction package or carefully considered at the time of construction to reduce potential weather related delays. A budget for undercut and replacement of up to 24 inches of possible unstable upper silt soils should be included in the project. Additional recommendations should be provided by the Geotechnical Engineer based on conditions noted at the time of site preparation.

Further evaluation of the need and recommendations for subgrade stabilization can be provided during construction as the geotechnical conditions are exposed.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 10 feet of structures, pavements or constructed slopes and other structural areas. General fill is material used to achieve grade outside of these areas, such as landscaped areas.

Reuse of On-Site Soil: Excavated on-site lean clay soil may be selectively reused as structural fill below foundations, pavements and landscaping areas.

Material property requirements for on-site lean clay soil for use as general fill and structural fill are noted in the table below:

Property	General Fill	Structural Fill
Composition	Free of deleterious material	Free of deleterious material
Sand content	Not limited	Not limited
Plasticity	Liquid Limit less than 45, Plasticity index greater than 10 and less than 25	
GeoModel Layer Expected to be Suitable [1]	2	2

1. Based on subsurface exploration. Actual material suitability should be determined in the field at time of construction.

Imported Fill Materials: Imported fill materials should meet the following material property requirements. Regardless of its source, compacted fill should consist of approved materials that are free of organic matter and debris.

Soil Type [1]	USCS Classification	Acceptable Parameters (for Structural Fill)
Low Plasticity Soil	CL, SC	Liquid Limit less than 45, Plasticity index greater than 10 and less than 25
River Sand	SP, SP-SM	Less than 10% Passing No. 200 sieve
Aggregate Base	GP, GM	LADOTD No. 610 Crushed Limestone or similarly graded crushed recycled concrete. [2]

1. Structural and general fill should consist of approved materials free of organic matter and debris. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site. Additional geotechnical consultation should be provided prior to use of uniformly graded gravel on the site.
2. Materials should meet the requirements of LSSRB Section 1003.03.

Fill Placement and Compaction Requirements

Structural and general fill should meet the following compaction requirements.

Item	Structural Fill	General Fill
Maximum Lift Thickness	9 inches or less in loose thickness when heavy, self-propelled compaction equipment is used. 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used.	Same as structural fill
Minimum Compaction Requirements [1,2,3]	95% of max. below foundations, floor slabs, and finished pavement subgrade. 100% of maximum dry density for aggregate base beneath pavement.	92% of max.
Water Content Range [1]	Low plasticity cohesive: 0 to +3% of optimum Granular: -3% to +3% of optimum Aggregate Base: -2% to +2% of optimum	As required to achieve min. compaction requirements.

1. Maximum density and optimum water content as determined by the standard Proctor test (ASTM D 698).
2. If the granular material is a coarse sand or gravel, or of a uniform size, or has a low fines content, compaction comparison to relative density may be more appropriate. In this case, granular materials should be compacted to at least 70% relative density (ASTM D 4253 and D 4254). Materials not amenable to density testing should be placed, compacted and conditioned at workable moisture levels to a stable condition observed without pumping when proofrolling by the Geotechnical Engineer or representative.

Grading and Drainage

All grades must provide effective drainage away from the building during and after construction and should be maintained throughout the life of the structure. Water retained next to the building can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential floor slab and/or foundation movements, cracked slabs and walls, and roof leaks. The roof should have gutters/drains with downspouts that discharge onto splash blocks at a distance of at least 10 feet from the building.

At project sites with minimal grade change and with developments and roads surrounding the construction area, such as the existing parking lot, it can be difficult to maintain positive drainage throughout the construction phase. The construction phase drainage should be considered in the development of the project overall grading and

drainage plan. The possible poor drainage conditions can lead to instability in the areas around the building and hamper construction progress. The site grading and general contractor should consider their means and methods to maintain drainage during the construction phase. It is sometimes prudent to consider specifying chemical treatment of critical project access roads and construction laydown areas as part of the construction package to reduce potential weather-related delays as described above.

Exposed ground should be sloped and maintained at a minimum 5% away from the building for at least 10 feet beyond the perimeter of the building. Locally, flatter grades may be necessary to transition ADA access requirements for flatwork. After building construction and landscaping have been completed, final grades should be verified to document effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted, as necessary, as part of the structure's maintenance program. Where paving or flatwork abuts the structure, a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Trees or other vegetation whose root systems can remove excessive moisture from the subgrade and foundation soils should not be planted next to the structure. Trees and shrubbery should be kept away from the exterior edges of the foundation element a distance at least equal to 1.5 times their expected mature height.

Earthwork Construction Considerations

Shallow excavations for the proposed structure are anticipated to be accomplished with conventional construction equipment, after removal of pavements. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of grade-supported improvements such as floor slabs and pavements. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction.

The groundwater table could affect overexcavation efforts, especially for overexcavation and replacement of lower strength soils. A temporary dewatering system consisting of sumps with pumps may be necessary to achieve the recommended depth of overexcavation depending on groundwater conditions at the time of construction.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety or the contractor's activities; such responsibility shall neither be implied nor inferred.

Excavations or other activities resulting in ground disturbance have the potential to affect adjoining properties and structures. Our scope of services does not include review of available final grading information or consider potential temporary grading performed by the contractor for possible effects such as ground movement beyond the project limits. A preconstruction/ precondition survey should be conducted to document nearby property/infrastructure prior to any site development activity. Excavation or ground disturbance activities adjacent property lines should be monitored or instrumented for potential ground movements that could negatively affect adjoining property and/or structures.

Construction Observation and Testing

The earthwork efforts should be observed by the Geotechnical Engineer (or others under their direction). Observation should include documentation of adequate removal of surficial materials (vegetation, topsoil, and pavements), evaluation and remediation of existing fill/debris materials, as well as proofrolling and mitigation of unsuitable areas delineated by the proofroll.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, as recommended by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the building areas and 5,000 square feet in pavement areas. Where not specified by local ordinance, one density and water content test should be performed for every 100 linear feet of compacted utility trench backfill and a minimum of one test performed for every 12 vertical inches of compacted backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated by the Geotechnical Engineer. If unanticipated conditions are observed, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

Deep Foundations

Drilled Concrete Shafts

Drilled concrete shafts are a common foundation system for the planned construction, and when suitably reinforced, are particularly efficient in resisting uplift and horizontal forces. The following paragraphs provide design recommendations and construction considerations for a drilled concrete shaft supported foundation system.

Drilled Shaft Design Capacity

We have predicted the nominal (allowable) compression and tension geotechnical capacity for various drilled concrete shaft diameters and depths for static load conditions using contributions from skin friction and end bearing. The nominal side friction resistance of the drilled concrete shafts was predicted for uncased conditions using published design approaches for calculation of skin friction including the alpha (α) method for cohesive soils and the beta (β) method for cohesionless soils, assuming uncased construction. The skin friction resistance from the upper 4 feet of the shaft was neglected. The nominal end bearing resistance for the drilled concrete shaft was estimated using classic bearing capacity theory for cohesive soils and empirical correlations between corrected Standard Penetration Test (SPT) N_{60} values and the mobilized base resistance for cohesionless soils. If casing is used, the nominal compression and tension capacity in the tables below should be reduced by 10%.

The following table provides our recommendations for the nominal (allowable) geotechnical capacity in kips for individual drilled shafts.

Drilled Shaft Axial Capacity Summary [1]

Drilled Shaft Tip Elevation (feet) [2]	Allowable Compression Capacity (tons) [3]					Allowable Tension Capacity (tons) [3]				
	Shaft Diameter (inches)					Shaft Diameter (inches)				
	36	42	48	54	60	36	42	48	54	60
-10	102	124	148	170	198	64	76	90	104	120
-15	112	136	160	188	216	72	88	102	118	136
-20	122	146	174	202	232	82	98	116	134	152
-25	130	152	178	202	226	92	108	128	148	168
-30	130	154	180	206	232	100	120	140	162	184

Drilled Shaft Axial Capacity Summary [1]										
Drilled Shaft Tip Elevation (feet) [2]	Allowable Compression Capacity (tons) [3]					Allowable Tension Capacity (tons) [3]				
	Shaft Diameter (inches)					Shaft Diameter (inches)				
	36	42	48	54	60	36	42	48	54	60
-35	140	174	208	244	276	105	126	148	170	196
-40	166	200	238	270	300	110	132	156	180	206
-45	178	214	254	290	322	120	144	170	198	224

1. Design capacities are dependent upon the method of installation, and quality control during installation. The values provided are estimates and should be verified when installation protocols have been finalized.
2. Measured from assumed top of shaft elevation of +25 Feet, NAVD.
3. The effective weight of the shaft can be added to uplift load capacity to the extent permitted by IBC.

The shaft capacities presented in the table above are the nominal (allowable) geotechnical capacities and an ASD factors of safety of 2.5 for compression and 3.0 for tension was used for the design. Provided below are the recommended factors of safety that can be considered for this project:

Field Capacity Verification Method	ASD Factor of Safety
No static load test, but full-time observation of production shaft installation.	2.5
Static Load Test on minimum 1 test shaft per structure (after verification that concrete is at design strength). Full-time observation of production shaft installation	2.0

Shafts should be adequately reinforced as designed by the Structural Engineer for both tension and shear to sufficient depths. Buoyant unit weights of the soil and concrete should be used in the calculations below the highest anticipated groundwater elevation.

Drilled shaft should have a minimum (center-to-center) spacing of three diameters. Closer spacing may require a reduction in axial load capacity. Axial capacity reduction can be determined by comparing the allowable axial capacity determined from the sum of individual shafts in a group versus the capacity calculated using the perimeter and

base of the shaft group acting as a unit. The lesser of the two capacities should be used in design.

A minimum shaft diameter of 36 inches should be used. Drilled shafts should have a minimum length of 35 feet and should extend into the bearing strata at least one shaft diameter for the allowable end-bearing pressures listed in the above table.

Post-construction settlements of drilled shafts designed and constructed as described in this report are estimated to range from about ½ to ¾ inch. Differential settlement between individual shafts is expected to be ½ to ⅔ of the total settlement.

Load Testing

If a factor of safety of 2 is used to establish the allowable shaft capacity, a static load test should be performed to validate the predicted axial capacity. The cost of the load test should be considered in the selection of the factor of safety/resistance factor for shaft design.

If a load test is planned, at least one shaft representing the predominant diameter and depth should be tested. However, if more than one depth will be used, additional load tests should be added. Alternatively, the shaft can be instrumented with strain gages to provide load distribution information during the testing of a single shaft to allow for estimating allowable loads for shorter shafts. The test shaft(s) should be installed using the installation methods planned for production foundation elements.

For a static load test, the shafts should be loaded to a minimum of 250% of its design capacity after confirming the concrete strength, but typically not sooner than 7 days after installation.

The load test including design of the reaction beam and shafts should be provided by the foundation contractor. However, the Geotechnical Engineer should oversee the load testing program and validate capacity predictions based upon the test results.

Drilled Shaft Lateral Loading

The following table lists input values for use in LPILE analyses to be performed by others. Such analysis should be considered if lateral loads exceeds 10 kips. Modern versions of LPILE provide estimated default values of k_h and E_{50} based on strength and are recommended for the project. Since deflection or a service limit criterion will most likely control lateral capacity design, no safety/resistance factor is included with the parameters.

Stratigraphy[1]		LPILE Soil Model	S_u (psf)[2]	ϕ[2]	γ' (pcf)[2]	ε_{50}	K (pci)	
Depth	Material						Static	Cyclic
0-5	Residual clay	Stiff Clay w/o Free Water	1,750	---	125	Use Default Value		
5-25	Residual clay	Stiff Clay w/o Free Water	2,000	---	125	Use Default Value		
25-35	Residual clay	Stiff Clay w/o Free Water	3,500	---	68	Use Default Value		
35-65	Residual clay	Stiff Clay w/o Free Water	1,500	---	63	Use Default Value		
65-80	Silty sand/sand	Sand (Reese)	---	35°	68	Use Default Value		

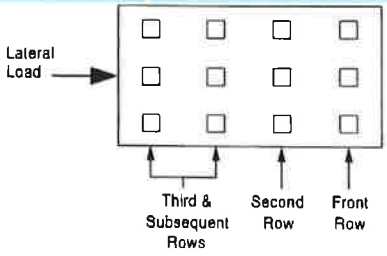
1. See Subsurface Profile in Geotechnical Characterization for more details on Stratigraphy.
2. Definition of Terms:
   S_u: Undrained shear strength
   ϕ: Internal friction angle
   γ': Effective unit weight

When shafts are used in groups, the lateral capacities of the shafts in the second, third, and subsequent rows of the group should be reduced as compared to the capacity of a single, independent shaft. Guidance for applying p-multiplier factors to the p values in the p-y curves for each row of shaft foundations within a shaft group are as follows:

Center to Center Shaft Spacing [1,2]	P-Multiplier, P_m [3]		
	Front Row	Second Row	Third and Subsequent Rows
3B	0.8	0.4	0.3
4B	0.9	0.65	0.5
5B	1.0	0.85	0.7
6B	1.0	1.0	1.0

Center to Center Shaft Spacing [1,2]	P-Multiplier, P_m [3]		
	Front Row	Second Row	Third and Subsequent Rows

1. Spacing in the direction of loading. B = shaft diameter
2. For the case of a single row of shafts supporting a laterally loaded grade beam, group action for lateral resistance of shafts would need be considered when spacing is less than three shaft diameters (measured center-to-center).
3. See adjacent figure for definition of front, second and third rows.



Spacing closer than 3D (where D is the diameter of the shaft) is not recommended without additional geotechnical consultation due to potential for the installation of a new shaft disturbing an adjacent installed shaft likely resulting in axial capacity reduction.

Drilled Shaft Construction Considerations

The drilling contractor should be experienced in the subsurface conditions observed at the site, and the excavations should be performed with equipment capable of providing a clean bearing surface. The drilled straight-shaft foundation system should be installed in general accordance with the procedures presented in "Standard Specification for the Construction of Drilled Piers", ACI Publication No. 336.1-01.

The contractor is generally expected to use conventional "dry" techniques for installation of the drilled shaft. Subsurface water was not encountered in boring during the drilling activities. Subsurface water levels are influenced by seasonal and climatic conditions, which result in fluctuations in subsurface water elevations. Additionally, it is common for water to be present after periods of significant rainfall. Casing or slurry drilling procedures could be required in soils zones of higher sand content (such as was observed in Model Layer 3 of the boring) to reduce the potential for excavation sidewall collapse.

A full-depth temporary steel casing may be required to shore the sides of the shaft excavations in the overburden due to the potential of cave-ins of sand pockets and seams. Difficult drilling conditions should be expected within the dense sand layers. If casing is removed during concrete placement, care should be exercised to maintain concrete inside the casing at a sufficient level to resist earth and hydrostatic pressures present on a casing exterior. Water or loose soil should be removed from the bottom of the drilled shafts prior to placement of the concrete.

Care should be taken to not disturb the sides and bottom of the excavation during construction. The bottom of the shaft excavation should be free of loose material before concrete placement. Concrete should be placed as soon as possible after the foundation excavation is completed, to reduce potential disturbance of the bearing surface.

While withdrawing casing, care should be exercised to maintain concrete inside the casing at a sufficient level to resist earth and hydrostatic pressures acting on the casing exterior. Arching of the concrete, loss of seal and other problems can occur during casing removal and result in contamination of the drilled shaft. These conditions should be considered during the design and construction phases. Placement of loose soil backfill should not be permitted around the casing prior to removal.

The drilled shaft installation process should be performed under the observation of the Geotechnical Engineer. The Geotechnical Engineer should document the shaft installation process including soil and groundwater conditions observed, consistency with expected conditions, and details of the installed shaft.

Augered Cast-in-Place (ACIP) Piles

Continuous Flight Auger piles, also referred to as Augered Cast-in-Place (ACIP) piles are a common foundation system for the planned construction. When suitably reinforced, ACIP piles are particularly efficient in resisting uplift and horizontal forces. The following paragraphs provide design recommendations and construction considerations for an ACIP pile-supported foundation system.

Augered Cast-in-Place (ACIP) Pile Design Parameters

The following table can be used to estimate capacities for individual ACIP piles. The values are considered adequate for estimation of allowable (safety factor applied) load carrying capacity for ACIP piles ranging in diameter from 18 inches to 24 inches and ranging in depth from 50 to 70 feet.

ACIP Pile Design Summary [1]								
ACIP Pile Tip Elevation (feet) [2]	Allowable Compression Capacity (tons) [3]				Allowable Tension Capacity (tons) [3,4]			
	Pile Diameter (inches)				Pile Diameter (inches)			
	18	20	22	24	18	20	22	24
-25	64	72	80	88	46	52	58	64
-30	68	76	84	92	52	58	64	72
-35	76	84	92	102	56	64	70	78
-40	92	106	118	130	62	70	78	86
-45	106	120	134	148	72	80	90	98

1. Design capacities are dependent upon the method of installation and quality control parameters. The values provided are estimates and should be verified after finalization of installation protocol.
2. Measured from assumed top of shaft elevation of +25 Feet, NAVD.
3. Predicted capacity after minimum 14-day set-up time.
4. The effective weight of the pile has been added to uplift load capacity. Tension capacity assumes pile adequately reinforced full depth.

The compression and tension pile capacity presented in the table above are the allowable geotechnical resistances using a factor of safety of 3. ACIP piles should be spaced at least three pile diameters apart (center-to-center) if side friction is used for compressive loads. Design capacities can be increased by 33% for highly transient loads such as wind loads, unless these transient loads have been included in the factored design load (subject to verification of allowable structural capacity). Provided below are the recommended factors of safety that can be considered for this project:

Field Capacity Verification Method	Factor of Safety
Static load test on minimum 1 test pile per depth and size (after verification that concrete is at design strength) per building. Full-time observation of production pile installation.	2

ACIP Pile Lateral Loading

The following table lists input values for use in LPILE analyses. Modern versions of LPILE provide estimated default values of k_h and E_{50} based on strength and are recommended for the project. Since deflection or a service limit criterion will most likely control lateral capacity design, no safety/resistance factor is included with the parameters.

Stratigraphy[1]		LPILE Soil Model	S_u (psf)[2]	ϕ[2]	γ' (pcf)[2]	ε_{50}	K (pci)	
Depth	Material						Static	Cyclic
0-5	Residual clay	Stiff Clay w/o Free Water	1,750	---	125	Use Default Value		
5-25	Residual clay	Stiff Clay w/o Free Water	2,000	---	125	Use Default Value		
25-35	Residual clay	Stiff Clay w/o Free Water	3,500	---	68	Use Default Value		
35-65	Residual clay	Stiff Clay w/o Free Water	1,500	---	63	Use Default Value		
65-80	Silty sand/sand	Sand (Reese)	---	35°	68	Use Default Value		

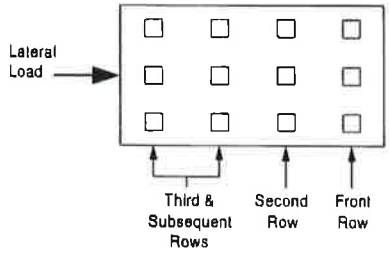
1. See Subsurface Profile in Geotechnical Characterization for more details on Stratigraphy.
2. Definition of Terms:
   S_u: Undrained shear strength
   ϕ: Internal friction angle
   γ': Effective unit weight

When piles are used in groups, the lateral capacities of the piles in the second, third, and subsequent rows of the group should be reduced as compared to the capacity of a single, independent pile. Guidance for applying p-multiplier factors to the p values in the p-y curves for each row of pile foundations within a pile group are as follows:

Center to Center Pile Spacing [1,2]	P-Multiplier, P_m [3]		
	Front Row	Second Row	Third and Subsequent Rows
3B	0.8	0.4	0.3
4B	0.9	0.65	0.5
5B	1.0	0.85	0.7

Center to Center Pile Spacing [1,2]	P-Multiplier, P_m [3]		
	Front Row	Second Row	Third and Subsequent Rows
6B	1.0	1.0	1.0

1. Spacing in the direction of loading. B = pile diameter
2. For the case of a single row of piles supporting a laterally loaded grade beam, group action for lateral resistance of piles would need be considered when spacing is less than three pile diameters (measured center-to-center).
3. See adjacent figure for definition of front, second and third rows.



ACIP Pile Construction Considerations

The ACIP piles are constructed by extending continuous hollow-stem augers to a predetermined depth and then pumping a fluid cement grout under pressure through the center of the hollow shaft, maintaining a head of grout as the augers are withdrawn, leaving a continuous concrete pile. The augers should be withdrawn at a controlled rate, and the grout volume and grout pressure should be monitored and documented by a representative of the geotechnical engineer on a full-time basis during construction.

Care should be taken so that the ACIP are not "overdrilled" or grout flow stopped prematurely during withdrawal, as this could result in loss of ground, settlement at the surface, or necking of grout near the surface. Installation of adjacent piles with a clear distance spacing of less than six pile diameters should be delayed until grout in the initial pile has set to avoid possible grout intrusion between the piles which could jeopardize pile integrity. At least one single reinforcing bar should extend full depth to confirm that grout was present full depth.

The installation of ACIP requires special equipment and procedures. This installation should only be performed by an experienced contractor with a history of successful work. Consideration should be given to selecting an ACIP installation contractor based on qualifications, rather than through a cost-only process. It is recommended that the perspective ACIP contractor develop a work plan to demonstrate their understanding of the project quality requirements, adjacent pile installation sequencing, grout mix design performance, etc.

Careful quality control is an essential element of construction. The inspector on ACIP installation projects has a significant role in the observation and recording of the contractor's QA/QC practices. A significant amount of testing, data collection by

automated equipment, and manual data should be recorded for pile installation. Key information to be documented at the time of installation include:

- Pile location;
- Pile tip (bottom) depth/elevation;
- Depth/Elevation of top of grout/concrete;
- Pile length;
- Auger diameter;
- Details of the reinforcing steel (number, size, and grade of bars);
- Flow cone efflux time and volume of grout placed;
- Grout volume placed;
- Theoretical volume of excavation (theoretical diameter = diameter of auger);
- Grout overage factor;
- Depth/Elevation to which reinforcing steel was placed;
- Date/Time of beginning and ending of drilling;
- Date/Time ready-mix grout or concrete truck arrived at project site, and copies of all
- Grout or concrete batch tickets used for the pile construction;
- Date/Time of beginning and completion of grout or concrete pumping;
- Reinforcement installation details;
- Weather conditions, including air temperature, at time of grout or concrete placement;
- Identification of all grout or concrete samples taken from the pile;
- Other pertinent data relative to the pile installation.

Proper construction techniques and quality control are important for the integrity of the deep foundation system. These construction efforts should be monitored and documented by the Geotechnical Engineer. The ACIP pile installation process should be performed under observation of the Geotechnical Engineer. The Geotechnical Engineer should document the pile installation process including soil and groundwater conditions observed, consistency with expected conditions, and details of the installed pile.

Floor Slabs

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the aggregate base beneath the floor slab.

Floor Slab Design Parameters

Item	Description
Floor Slab Support	Use 4 inches of free-draining (less than 10% passing the No. 200 sieve) sand compacted to at least 95% of ASTM D698.

Item	Description
	Overlying 2 feet of low-plasticity cohesive materials Subgrade stabilized following recommendations in **Earthwork**
Estimated Modulus of Subgrade Reaction [1]	100 pounds per square inch per inch (psi/in) for point loads

1. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in **Earthwork**, and the floor slab support as noted in this table. It is provided for point loads. For large area loads the modulus of subgrade reaction would be lower.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, when the project includes humidity-controlled areas, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut contraction joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations, refer to the ACI Design Manual. Joints or cracks should be sealed with a waterproof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Floor Slab Construction Considerations

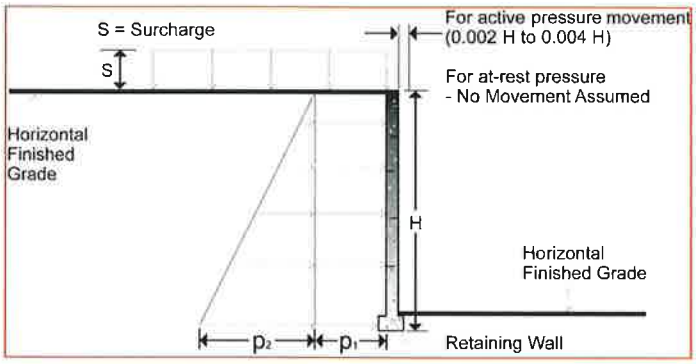
Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed, and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should observe the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

Lateral Earth Pressures

Design Parameters

Structures with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to values indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction, and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown in the diagram below. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The "at-rest" condition assumes no wall movement and is commonly used for basement walls, loading dock walls, or other walls restrained at the top. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls (unless stated).



Lateral Earth Pressure Design Parameters

Earth Pressure Condition [1]	Coefficient for Backfill Type [2]	Surcharge Pressure [3] p_1 (psf)	Equivalent Fluid Pressures (psf) [2,4]	
			Unsaturated [5]	Submerged [5]
Active (Ka)	Granular - 0.31	(0.31)S	(40)H	(80)H
	Fine Grained - 0.41	(0.41)S	(50)H	(85)H
At-Rest (Ko)	Granular - 0.47	(0.47)S	(55)H	(90)H
	Fine Grained - 0.58	(0.58)S	(70)H	(95)H

1. For active earth pressure, wall must rotate about base, with top lateral movements 0.002 H to 0.004 H, where H is wall height. For passive earth pressure, wall must move horizontally to mobilize resistance. Fat clay or other expansive soils should not be used as backfill behind the wall.
2. Uniform, horizontal backfill, with a maximum unit weight of 120 pcf for cohesive soils and 125 pcf for granular soils.

Lateral Earth Pressure Design Parameters

Earth Pressure Condition [1]	Coefficient for Backfill Type [2]	Surcharge Pressure [3] p_1 (psf)	Equivalent Fluid Pressures (psf) [2,4]	
			Unsaturated [5]	Submerged [5]

3. Uniform surcharge, where S is surcharge pressure.
4. Loading from heavy compaction equipment is not included.
5. To achieve "Unsaturated" conditions, follow guidelines in **Subsurface Drainage for Below-Grade Walls** below. "Submerged" conditions are recommended when drainage behind walls is not incorporated into the design.

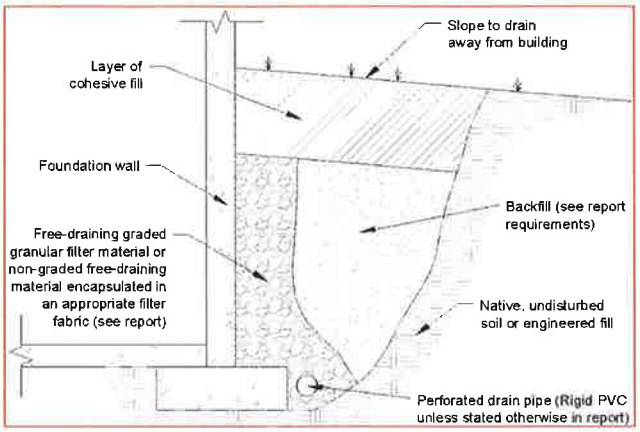
Backfill placed against structures should consist of granular soils or low plasticity cohesive soils. For the granular values to be valid, the granular backfill must extend out and up from the base of the wall at an angle of at least 45 degrees from vertical for the active case.

Footings, floor slabs or other loads bearing on backfill behind walls may have a significant influence on the lateral earth pressure. Placing footings within wall backfill and in the zone of active soil influence on the wall should be avoided unless structural analyses indicate the wall can safely withstand the increased pressure.

The lateral earth pressure recommendations given in this section are applicable to the design of rigid retaining walls subject to slight rotation, such as cantilever, or gravity type concrete walls. These recommendations are not applicable to the design of modular block - geogrid reinforced backfill walls (also termed MSE walls). Recommendations covering these types of wall systems are beyond the scope of services for this assignment. However, we would be pleased to develop a proposal for evaluation and design of such wall systems upon request.

Subsurface Drainage for Below-Grade Walls

A perforated rigid plastic drain line installed behind the base of walls and extends below adjacent grade is recommended to prevent hydrostatic loading on the walls. The invert of a drain line around a below-grade building area or exterior retaining wall should be placed near foundation bearing level. The drain line should be sloped to provide positive gravity drainage to daylight or to a sump pit and pump. The drain line should be surrounded by clean, free-draining granular material having less than 5% passing the No. 200 sieve, such as No. 57 aggregate. The free-draining aggregate should be encapsulated in a filter fabric. The granular fill should extend to within 2 feet of final grade, where it should be capped with compacted cohesive fill to reduce infiltration of surface water into the drain system.



As an alternative to free-draining granular fill, a prefabricated drainage structure may be used. A prefabricated drainage structure is a plastic drainage core or mesh which is covered with filter fabric to prevent soil intrusion and is fastened to the wall prior to placing backfill.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third

parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly affect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Figures

Contents:

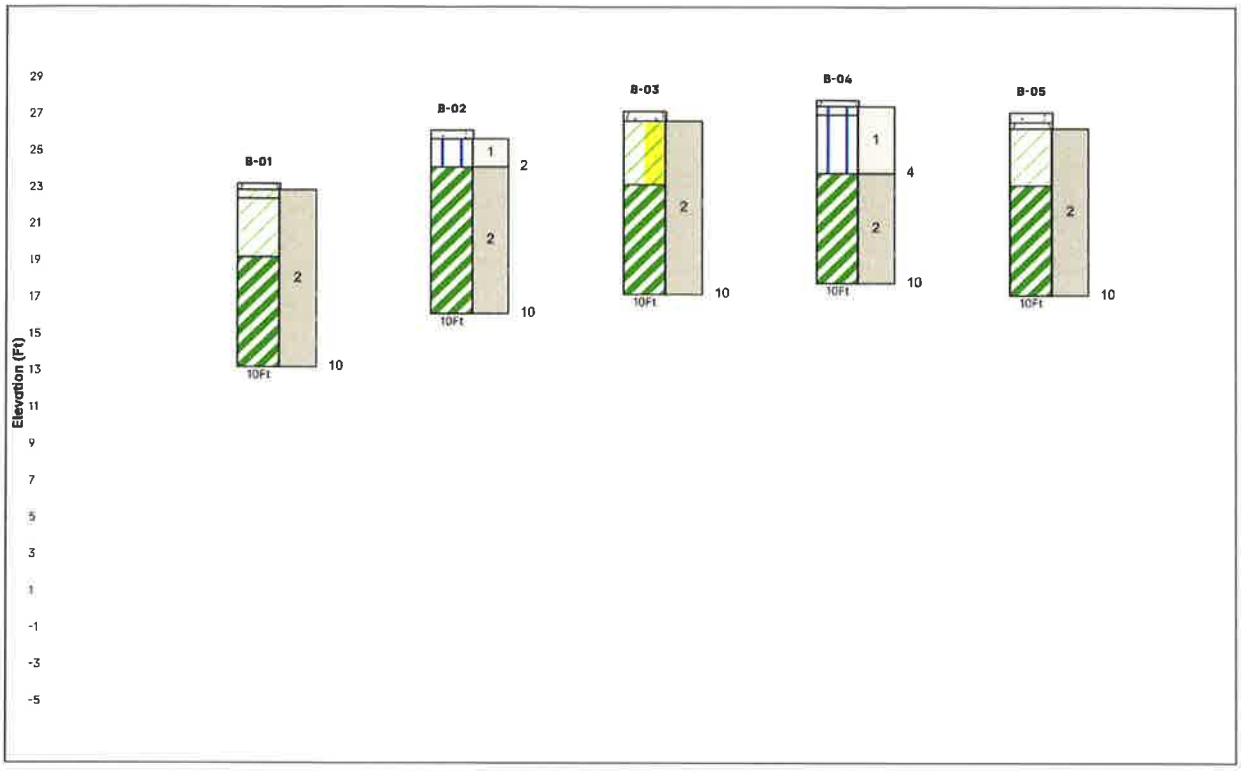
GeoModel

Note: All attachments are one page unless noted above.

NOHS Parking Garage-N Oaks Dr-BTR-26-Project
15837 Paul Vega MD Dr, Hammond, LA, 70403,USA
Terracon Project No: 1000027988

Terracon
2822 O'Neal Ln, Bldg B
Baton Rouge, LA 70816-3127

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions

#	Layer Name	General Description
1	**Upper Silts**	Brown and gray silts
2	**Upper Clay**	Brown, very stiff to stiff silts and clays with sand seams

Legend		
Concrete	Silt	Fat Clay
Topsoil	Lean Clay	Lean Clay with Sand

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

Notes:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

First Water Observation
Second Water Observation
Third Water Observation

Attachments

Exploration and Testing Procedures

Field Exploration

Number of Borings	Type of Exploration	Boring Depth (feet)	Planned Location
5	Soil Boring	10	Parking area
5	CPT	80 or refusal	Parking area

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal accuracy of about ±10 feet) and referencing existing site features. Approximate ground surface elevations were estimated using Google Earth imagery. If elevations and a more precise boring layout are desired, we recommend borings be surveyed.

Subsurface Exploration Procedures: We advanced the borings with a ATV-mounted rotary drill rig using continuous flight augers (solid stem) to a depth of around 10 feet. At least five samples were obtained in the upper 10 feet of each boring. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed hydraulically into the soil to obtain a relatively undisturbed sample. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with auger cuttings or cement-bentonite grout after their completion, consistent with state regulations. Pavements were patched with cold-mix asphalt or pre-mixed concrete, as appropriate.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials observed during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

At each designated location, a CPT sounding was performed by pushing a 10-square centimeter electric cone penetrometer at an approximate rate of 20 millimeters/second using the hydraulic cylinders of the drilling rig. The cone penetrometer is equipped with electronic load cells to measure tip resistance and sleeve resistance, and a pressure transducer to measure the generated ambient pore pressure.

Digital data representing the tip resistance, the sleeve penetration, the pore pressure and the CPT sounding inclination are typically measured at 50 mm intervals during penetration using a CPT data acquisition system or logger. These data were transferred to an on-site computer using a cable transmission system. This process allowed continuous monitoring of the data as the cone was advanced in real-time.

Upon completing the test, the data collected was downloaded directly from the CPT data logger to an on-site computer. The collected data was then interpreted using a software package provided by the cone manufacturer to provide the cone and sleeve resistance, pore pressure and inclination. The software also provides interpretation of soil behavior types (clay, silt, sand, etc.) and selected soil parameters, such as undrained shear strength, overconsolidation ratio, and equivalent standard penetration resistance. The testing and calibration of the CPT device was conducted in general conformance with ASTM D5778.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following types of tests:

- Moisture Content
- Atterberg Limits
- Dry Unit Weight
- Unconfined Compression

The laboratory testing program included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in accordance with the Unified Soil Classification System.

Site Location and Exploration Plans

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

Site Location

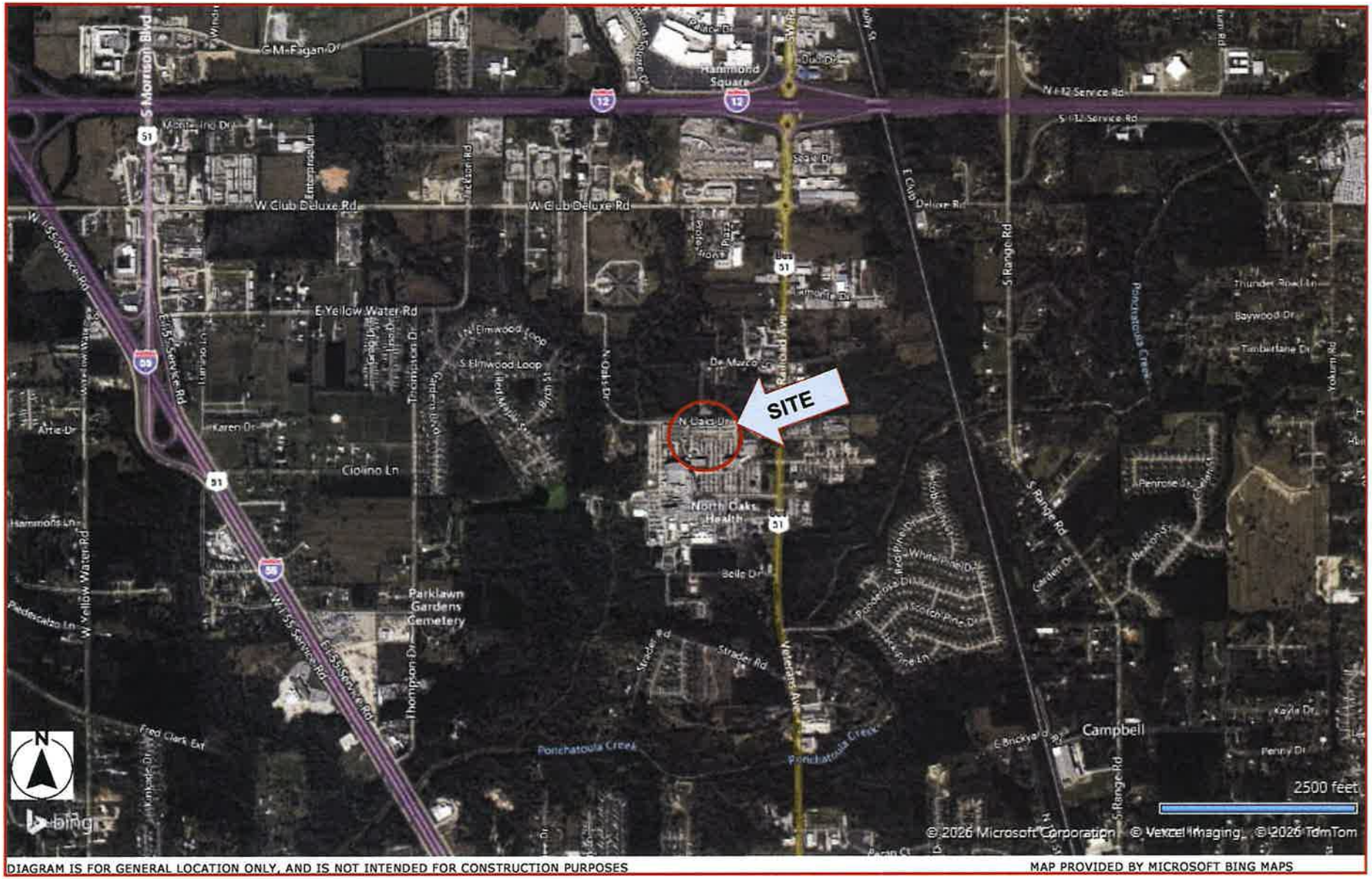


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Boring Logs (5 pages)
CPT Boring Logs (5 pages)

Note: All attachments are one page unless noted above.

NOHS Parking Garage
15837 Paul Vega MD Dr | Hammond, LA
Terracon Project No. 1000027988

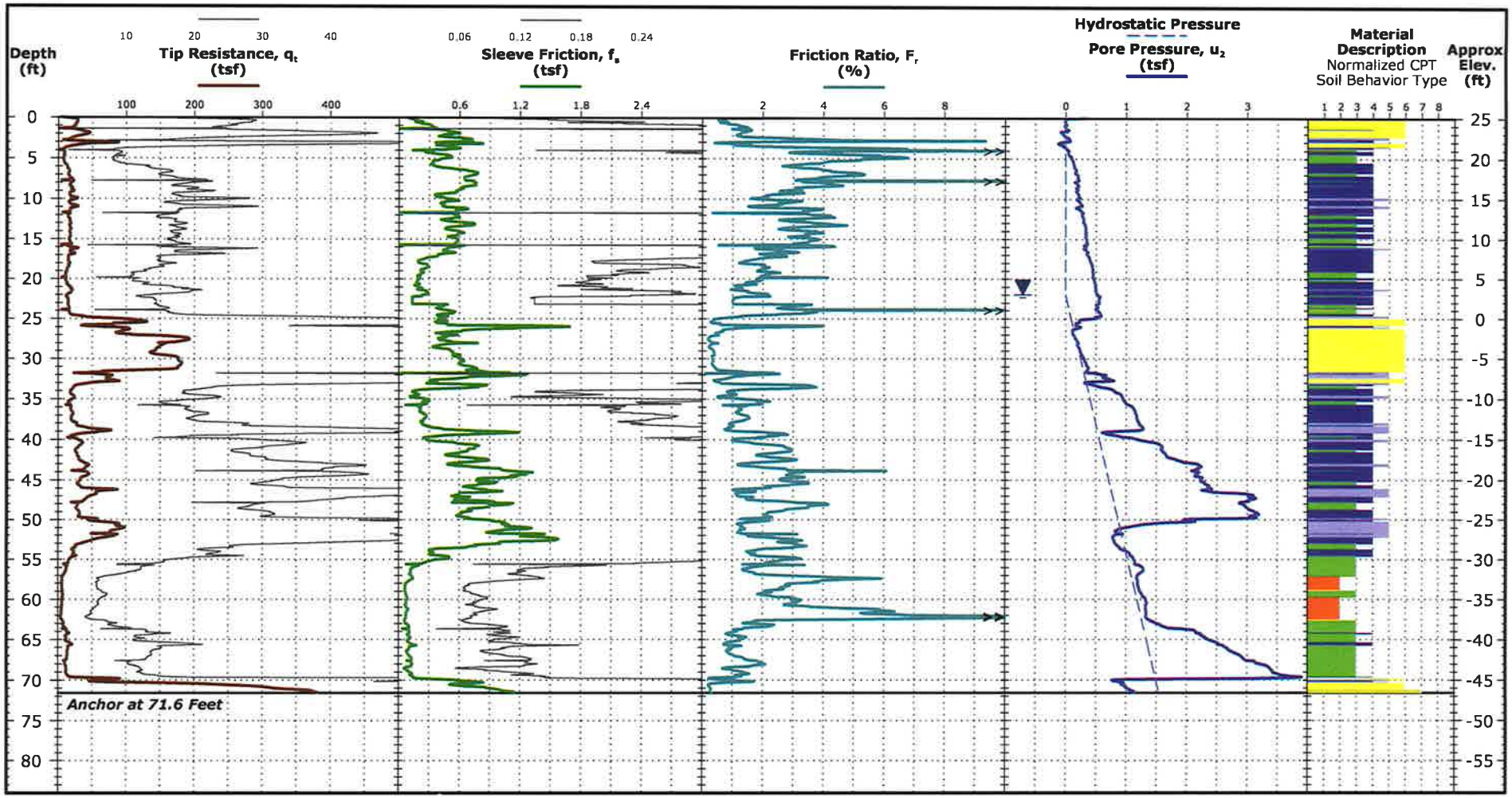
CPT Sounding ID CPT-01

Latitude: 30.467880° Longitude: -90.460840°

Elevation: 25 (ft) +/-

Terracon
2822 O'Neal Ln, Bldg B
Baton Rouge, LA

CPT Started: 7/24/2026
CPT Completed: 7/24/2026



See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data, if any.

See Supporting Information for explanation of symbols and abbreviations.

Notes

Test Location: See Exploration Plan

CPT Equipment

CPT Rig: Geoprobe
Operator: D. Gannfors
CPT sensor calibration reports available upon request
Probe No. 8118 with net area ratio of .844
Manufactured by Geoprobe Systems- Calibrated 11/27/2024
Tip and sleeve areas of 15 cm^2 and 225 cm^2

Water Level Observation

22 ft estimated water depth
(used in normalizations and correlations)

Normalized Soil Behavior Type
(Robertson 1990)

1 Sensitive, fine grained
2 Organic soils - clay
3 Clay - silty clay to clay
4 Silt mixtures - clayey silt to silty clay
5 Sand mixtures - silty sand to sandy silt
6 Sands - clean sand to silty sand
7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

NOHS Parking Garage
15837 Paul Vega MD Dr | Hammond, LA
Terracon Project No. 1000027988

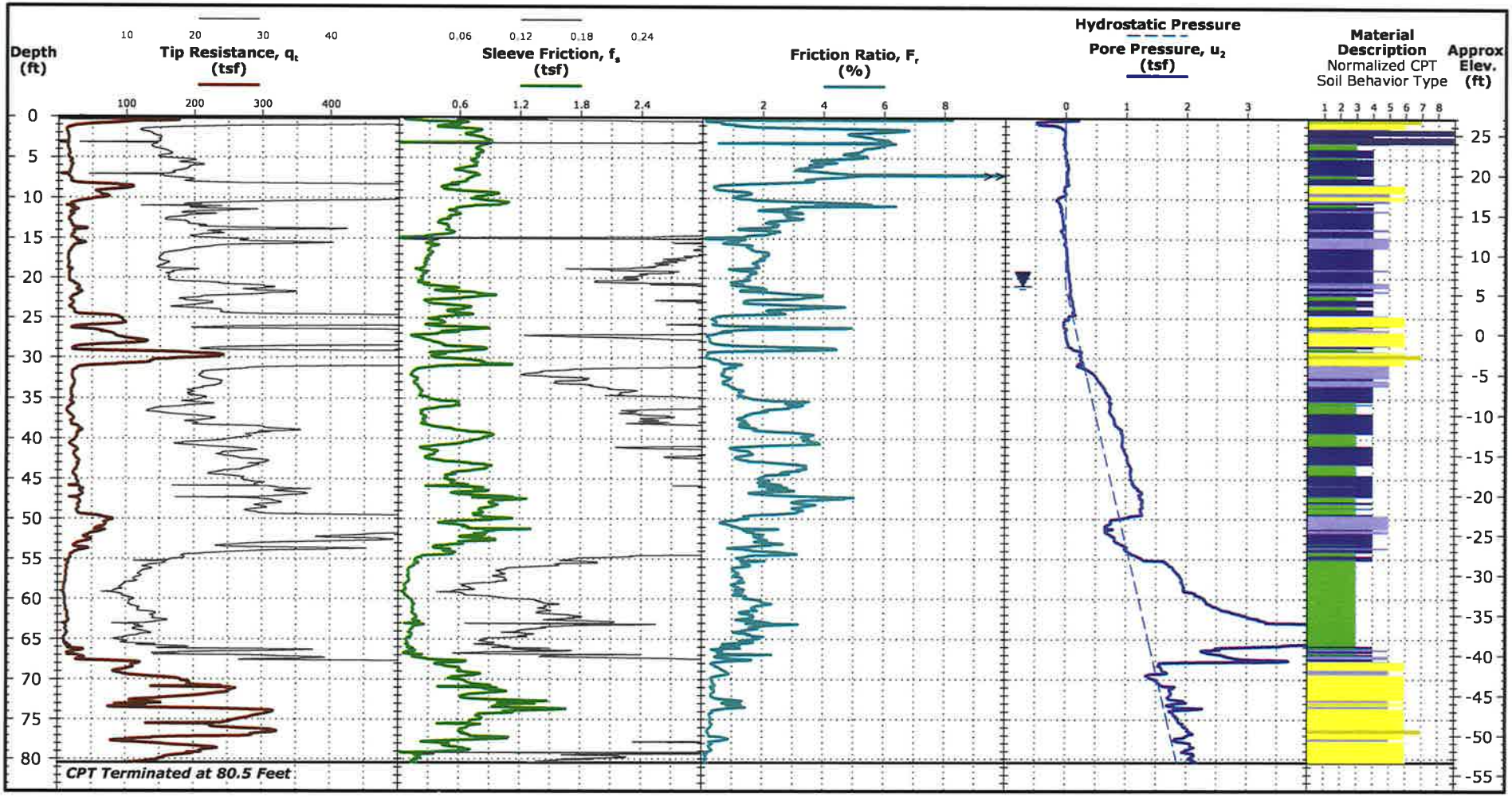
CPT Sounding ID CPT-02

Latitude: 30.467470° Longitude: -90.460600°

Elevation: 27 (ft) +/-

Terracon
2822 O'Neal Ln, Bldg B
Baton Rouge, LA

CPT Started: 7/23/2026
CPT Completed: 7/23/2026



See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data, if any.

See Supporting Information for explanation of symbols and abbreviations.

Notes

Test Location: See Exploration Plan

CPT Equipment

CPT Rig: Geoprobe
Operator: D. Gannfors
CPT sensor calibration reports available upon request
Probe No. 8118 with net area ratio of .844
Manufactured by Geoprobe Systems- Calibrated 11/27/2024
Tip and sleeve areas of 15 cm^2 and 225 cm^2

Water Level Observation

21 ft estimated water depth
(used in normalizations and correlations)

Normalized Soil Behavior Type
(Robertson 1990)

1 Sensitive, fine grained
2 Organic soils - clay
3 Clay - silty clay to clay
4 Silt mixtures - clayey silt to silty clay
5 Sand mixtures - silty sand to sandy silt
6 Sands - clean sand to silty sand
7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

NOHS Parking Garage
15837 Paul Vega MD Dr | Hammond, LA
Terracon Project No. 1000027988

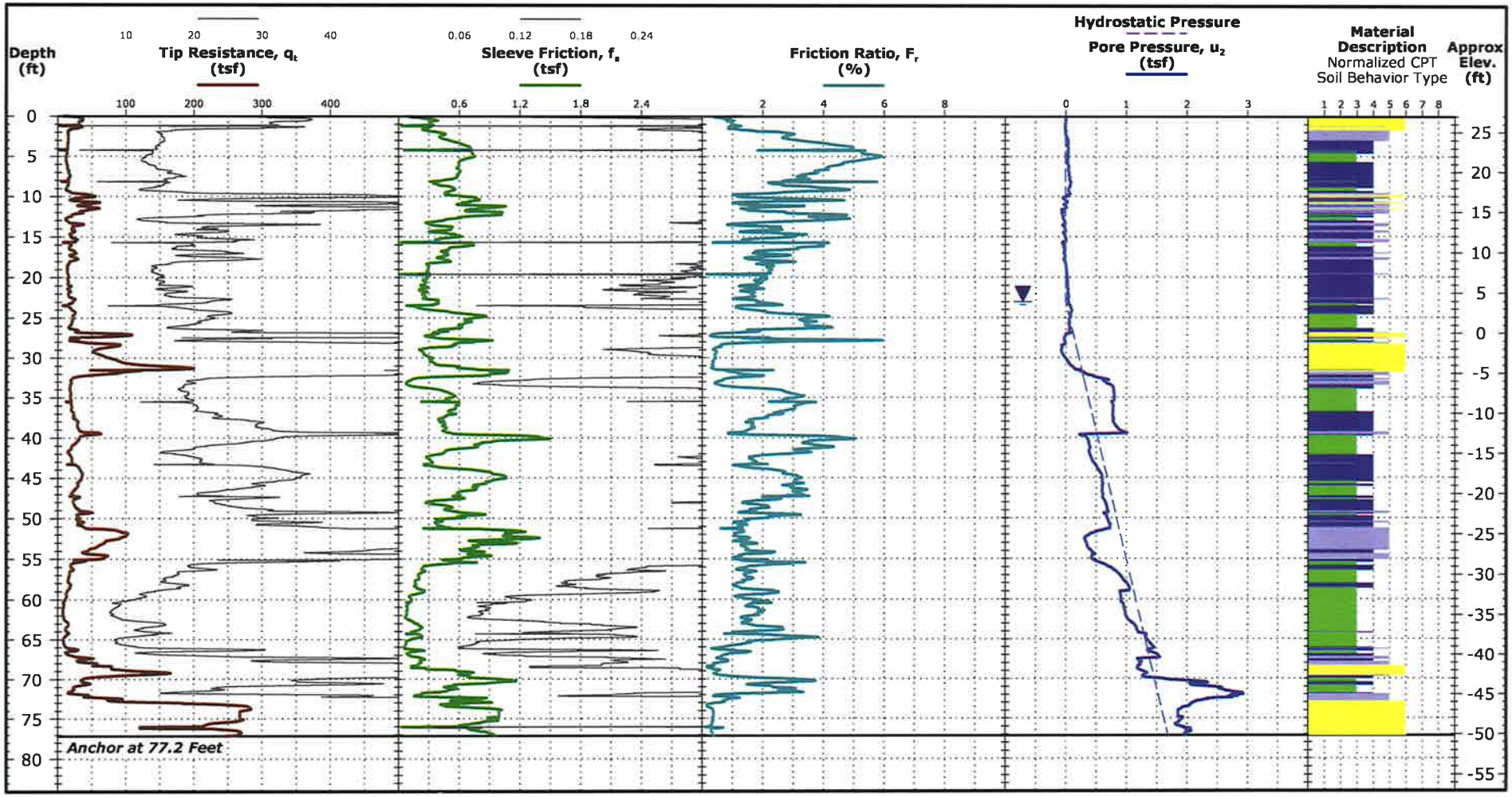
CPT Sounding ID CPT-03

Latitude: 30.467800° Longitude: -90.460320°

Elevation: 27 (ft) +/-

Terracon
2822 O'Neal Ln, Bldg B
Baton Rouge, LA

CPT Started: 7/24/2026
CPT Completed: 7/24/2026



See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data, if any.

See Supporting Information for explanation of symbols and abbreviations.

Notes

Test Location: See Exploration Plan

CPT Equipment

CPT Rig: Geoprobe
Operator: D. Gannfors
CPT sensor calibration reports available upon request
Probe No. 8118 with net area ratio of .844
Manufactured by Geoprobe Systems- Calibrated 11/27/2024
Tip and sleeve areas of 15 cm^2 and 225 cm^2

Water Level Observation

23 ft estimated water depth
(used in normalizations and correlations)

Normalized Soil Behavior Type
(Robertson 1990)

1 Sensitive, fine grained
2 Organic soils - clay
3 Clay - silty clay to clay
4 Silt mixtures - clayey silt to silty clay
5 Sand mixtures - silty sand to sandy silt
6 Sands - clean sand to silty sand
7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

NOHS Parking Garage
15837 Paul Vega MD Dr | Hammond, LA
Terracon Project No. 1000027988

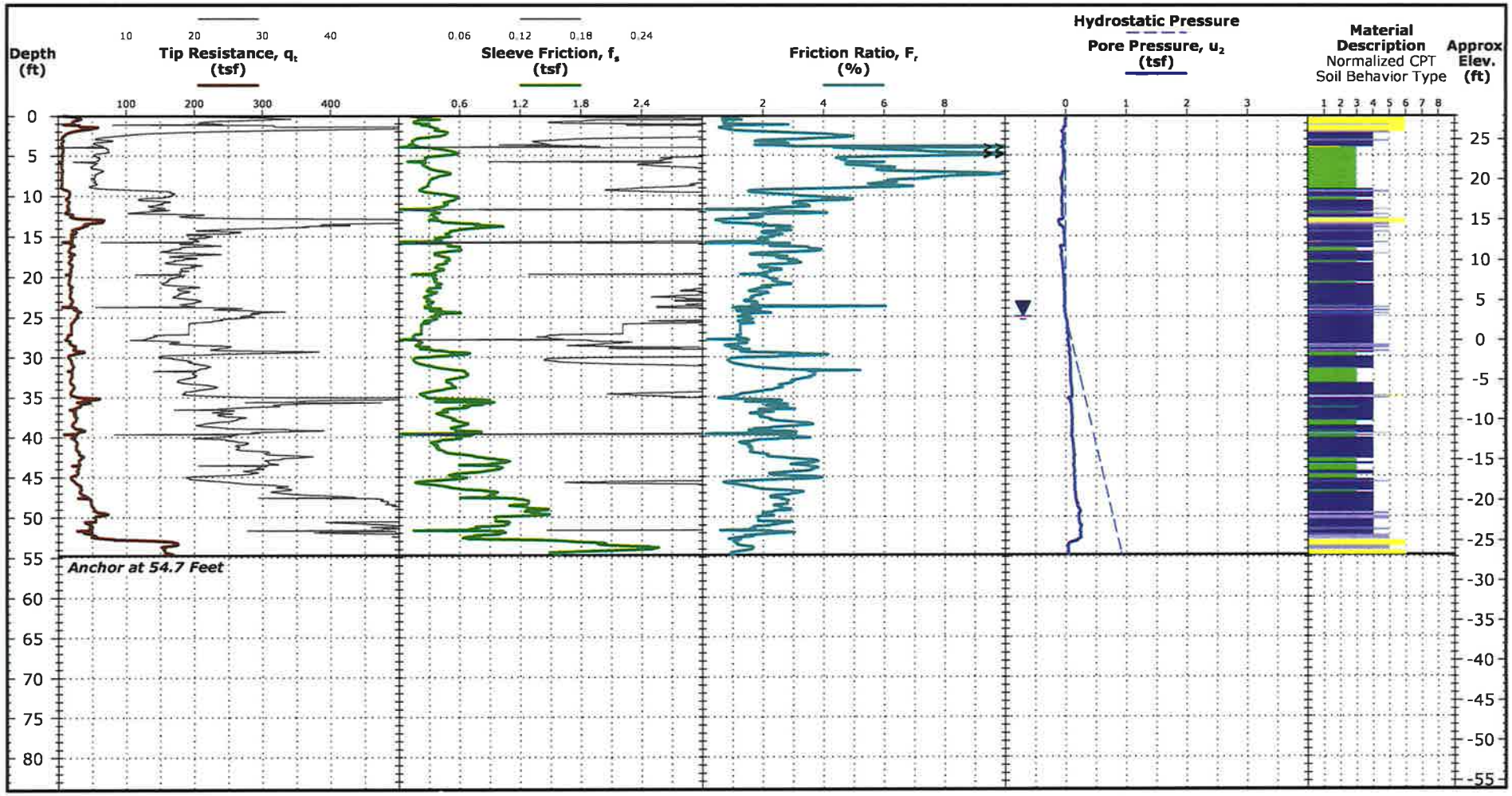
CPT Sounding ID CPT-04

Latitude: 30.467990° Longitude: -90.459800°

Elevation: 28 (ft) +/-

Terracon
2822 O'Neal Ln, Bldg B
Baton Rouge, LA

CPT Started: 7/24/2026
CPT Completed: 7/24/2026



See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data, if any.

See Supporting Information for explanation of symbols and abbreviations.

Notes

Test Location: See Exploration Plan

CPT Equipment

CPT Rig: Geoprobe
Operator: D. Gannfors
CPT sensor calibration reports available upon request
Probe No. 8118 with net area ratio of .844
Manufactured by Geoprobe Systems- Calibrated 11/27/2024
Tip and sleeve areas of 15 cm^2 and 225 cm^2

Water Level Observation

25 ft estimated water depth
(used in normalizations and correlations)

Normalized Soil Behavior Type
(Robertson 1990)

1 Sensitive, fine grained
2 Organic soils - clay
3 Clay - silty clay to clay
4 Silt mixtures - clayey silt to silty clay
5 Sand mixtures - silty sand to sandy silt
6 Sands - clean sand to silty sand
7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

NOHS Parking Garage
15837 Paul Vega MD Dr | Hammond, LA
Terracon Project No. 1000027988

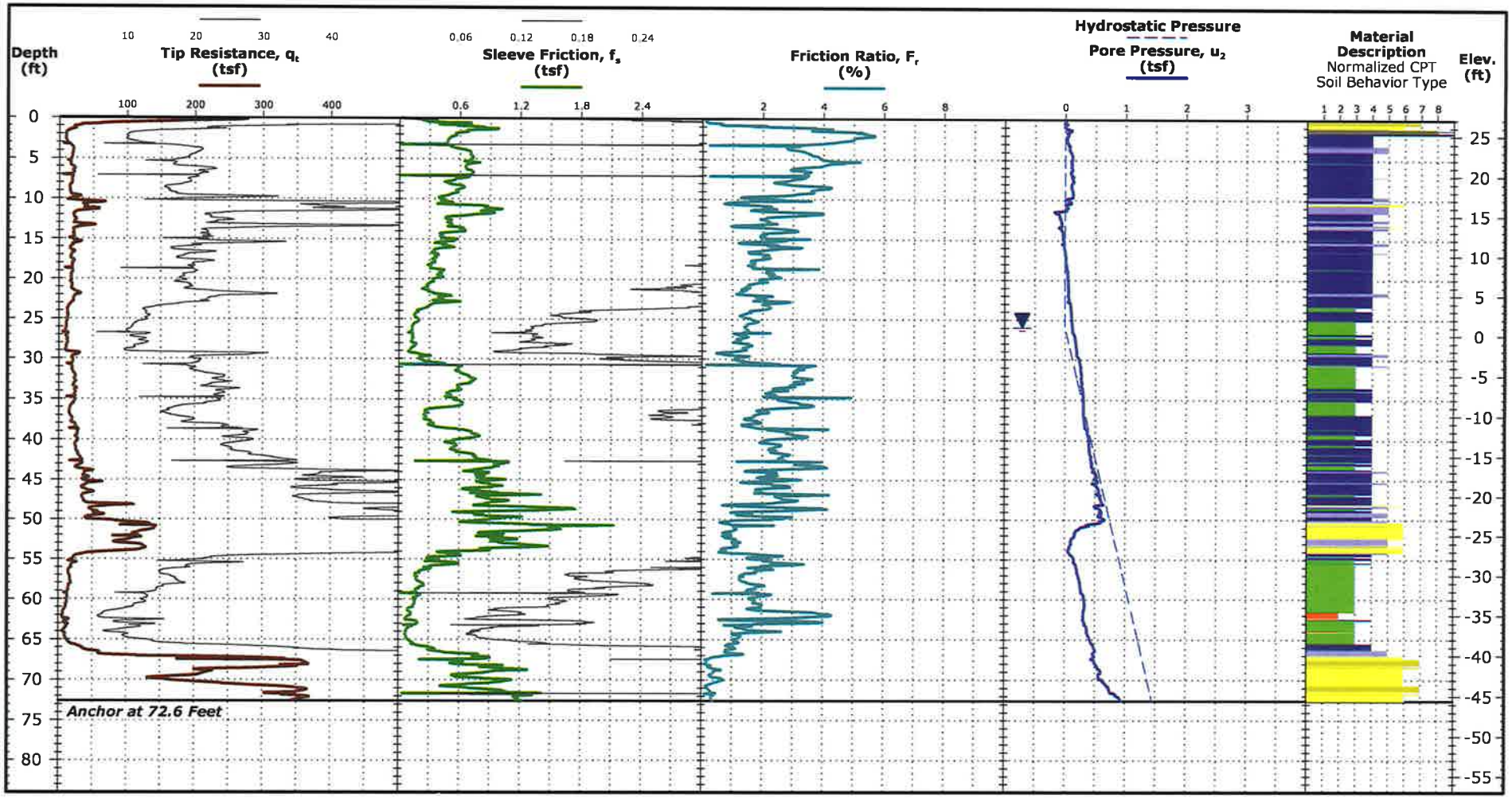
CPT Sounding ID CPT-05

Latitude: 30.467530° Longitude: -90.459880°

Elevation: 27 (ft)

Terracon
2822 O'Neal Ln, Bldg B
Baton Rouge, LA

CPT Started: 7/24/2026
CPT Completed: 7/24/2026



See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data, if any.

See Supporting Information for explanation of symbols and abbreviations.

Notes

Test Location: See Exploration Plan

CPT Equipment

CPT Rig: Geoprobe
Operator: D. Gannfors
CPT sensor calibration reports available upon request
Probe No. 8118 with net area ratio of .844
Manufactured by Geoprobe Systems- Calibrated 11/27/2024
Tip and sleeve areas of 15 cm^2 and 225 cm^2

Water Level Observation

26 ft estimated water depth
(used in normalizations and correlations)

Normalized Soil Behavior Type
(Robertson 1990)

1 Sensitive, fine grained
2 Organic soils - clay
3 Clay - silty clay to clay
4 Silt mixtures - clayey silt to silty clay
5 Sand mixtures - silty sand to sandy silt
6 Sands - clean sand to silty sand
7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

NOHS Parking Garage-N Oaks Dr-BTR-26-Project
15837 Paul Vega MD Dr, Hammond, LA, 70403,USA
Terracon Project No. 1000027988

Latitude: 30.46788° Longitude: -90.46084°

BORING LOG NO. B-01

Terracon
2822 O'Neal Ln, Bldg B
Baton Rouge, LA 70816-3127

Surface Elevation:
23.43(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Hand Penetrometer (tsf)	Strength Test: Compressive Strength (psf)	Strength Test: Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits: LL	Atterberg Limits: PL	Atterberg Limits: PI
		0.3	**TOPSOIL**, 4 INCHES		23.4										
2		0.8	**LEAN CLAY (CL)**, brown, stiff to very stiff		23.1		9	4.50	3170	3.6	11.2	105.9			
			- low strain failure at 0 feet		22.6		9	3.00			14.1		28	12	16
							7	3.00							
		4.0	**FAT CLAY (CH)**, brown, stiff		19.4										
				5			10	3.50			19.3		65	19	46
							10	2.50							
							9	4.00	3040	9.7	23.2	100.3			
			Boring Terminated at 10 Ft												

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Advancement Method
0-10 Ft. Solid Stem/Flight Auger

Abandonment Method
Boring backfilled with auger cuttings. Surface capped with concrete upon completion.

Equipment
1500/Geoprobe 20 CPT press

Driller
D. Gannfors

Logged By
A. Grant

Start Date
07/24/2026

NOHS Parking Garage-N Oaks Dr-BTR-26-Project
15837 Paul Vega MD Dr, Hammond, LA, 70403,USA
Terracon Project No. 1000027988

Latitude: 30.46746° Longitude: -90.4606°

BORING LOG NO. B-02

Terracon
2822 O'Neal Ln, Bldg B
Baton Rouge, LA 70816-3127

Surface Elevation:
26.35(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Hand Penetrometer (tsf)	Strength Test: Compressive Strength (psf)	Strength Test: Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Percent Fines	Atterberg Limits: LL	Atterberg Limits: PL	Atterberg Limits: PI
		0.5	**CONCRETE**,5.5 INCHES		26.4											
1			**SILT (ML)**, brown and gray, medium stiff		25.9						25.3					
		2.0			24.4						27.6			NP	NP	NP
2			**FAT CLAY (CH)**, brown, stiff to very stiff				10	3.00	3770	14.9	20.2	102.0		80	23	57
				5			10	3.00.								
							6	3.50	4650	10.2	25.6	100.7	99			
							6.5	3.50								
			Boring Terminated at 10 Ft													

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
0-10 Ft. Solid Stem/Flight Auger

Abandonment Method
Boring backfilled with auger cuttings. Surface capped with concrete upon completion.

Equipment
1500/Geoprobe 20 CPT press

Driller
D. Gannfors

Logged By
A. Grant

Start Date
07/23/2026

NOHS Parking Garage-N Oaks Dr-BTR-26-Project
15837 Paul Vega MD Dr, Hammond, LA, 70403,USA
Terracon Project No. 1000027988

Latitude: 30.4678° Longitude: -90.46032°

BORING LOG NO. B-03

Terracon
2822 O'Neal Ln, Bldg B
Baton Rouge, LA 70816-3127

Surface Elevation:
27.4(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Hand Penetrometer (tsf)	Strength Test: Compressive Strength (psf)	Strength Test: Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Percent Fines	Atterberg Limits: LL	Atterberg Limits: PL	Atterberg Limits: PI
		0.5	**TOPSOIL**,5 INCHES		27.4											
			LEAN CLAY WITH SAND (CL), brown, very stiff		26.9		8	4.50	4250	6.2	15.4	104.5		46	15	31
											13.4		76			
2							6	2.50								
		4.0			23.4											
			FAT CLAY (CH), brown, stiff	5			6	3.00			26.6			76	28	48
							7	2.50	3170	7.9	22	100.8				
							6	3.50								
			Boring Terminated at 10 Ft													

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Advancement Method
0-10 Ft. Solid Stem/Flight Auger

Abandonment Method
Boring backfilled with auger cuttings. Surface capped with concrete upon completion.

Equipment
1500/Geoprobe 20 CPT press

Driller
D. Gannfors

Logged By
A. Grant

Start Date
07/24/2026

NOHS Parking Garage-N Oaks Dr-BTR-26-Project
15837 Paul Vega MD Dr, Hammond, LA, 70403,USA
Terracon Project No. 1000027988

Latitude: 30.46791° Longitude: -90.46°

BORING LOG NO. B-04

Terracon
2822 O'Neal Ln, Bldg B
Baton Rouge, LA 70816-3127

Surface Elevation:
28.02(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Hand Penetrometer (tsf)	Strength Test: Compressive Strength (psf)	Strength Test: Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits: LL	Atterberg Limits: PL	Atterberg Limits: PI
		0.3	**TOPSOIL**, 4 INCHES		28.0		7	4.50	2760	4.4	11.8	113.7			
1		0.8	**SILT (ML)**, gray and brown, stiff to very stiff - low strain failure at 0 feet		27.7		10	3.00			19.2		NP	NP	NP
					27.2		10	2.50							
		4.0			24.0										
2			**FAT CLAY (CH)**, light brown, medium stiff	5			5	2.00	1330	11	22.3	93.1			
							6	2.00							
							5	2.50			23.4		63	17	46
			Boring Terminated at 10 Ft												

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Advancement Method
0-10 Ft. Solid Stem/Flight Auger

Abandonment Method
Boring backfilled with auger cuttings. Surface capped with concrete upon completion.

Equipment
1500/Geoprobe 20 CPT press

Driller
D. Gannfors

Logged By
A. Grant

Start Date
07/24/2026

NOHS Parking Garage-N Oaks Dr-BTR-26-Project
15837 Paul Vega MD Dr, Hammond, LA, 70403,USA
Terracon Project No. 1000027988

Latitude: 30.46753° Longitude: -90.45988°

BORING LOG NO. B-05

Terracon
2822 O'Neal Ln, Bldg B
Baton Rouge, LA 70816-3127

Surface Elevation:
27.36(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Hand Penetrometer (tsf)	Strength Test: Compressive Strength (psf)	Strength Test: Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits: LL	Atterberg Limits: PL	Atterberg Limits: PI
		0.5	**CONCRETE**,6.5 INCHES		27.4						6.8		23	13	10
		0.9	**TOPSOIL**,4 INCHES		26.8										
2			**LEAN CLAY (CL)**, brown, medium stiff		26.5						4.8				
							5	2.50							
		4.0			23.4										
			FAT CLAY (CH), brown, stiff	5			5.5	2.00	2840	14.5	23.1	99.2	64	17	47
							6	3.00							
							6	3.50	2840	7.9	23.4	99.0			
			Boring Terminated at 10 Ft												

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Advancement Method
0-10 Ft. Solid Stem/Flight Auger

Abandonment Method
Boring backfilled with auger cuttings. Surface capped with concrete upon completion.

Equipment
1500/Geoprobe 20 CPT press

Driller
D. Gannfors

Logged By
A. Grant

Start Date
07/24/2026

Supporting Information

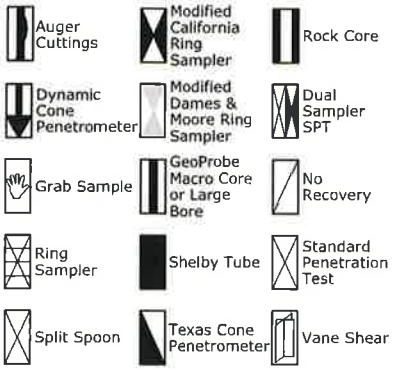
Contents:

General Notes
CPT General Notes
Unified Soil Classification System

Note: All attachments are one page unless noted above.

General Notes

Sampling



Water Level



Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

Field Tests

N	Standard Penetration Test Resistance (Blows/Ft.)
(HP)	Hand Penetrometer
(T)	Torvane
(DCP)	Dynamic Cone Penetrometer
UC	Unconfined Compressive Strength
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

Descriptive Soil Classification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density of Coarse-Grained Soils (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		Consistency of Fine-Grained Soils (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Relative Density	**Standard Penetration or N-Value (Blows/Ft.)**	**Consistency**	**Unconfined Compressive Strength Qu (tsf)**	**Standard Penetration or N-Value (Blows/Ft.)**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	5 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	9 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	16 - 30
		Hard	> 4.00	> 30

Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

CPT GENERAL NOTES

terracon

DESCRIPTION OF MEASUREMENTS AND CALIBRATIONS

To be reported per ASTM D5778:

Uncorrected Tip Resistance, q_c
Measured force acting on the cone divided by the cone's projected area

Corrected Tip Resistance, q_t
Cone resistance corrected for porewater and net area ratio effects
$q_t = q_c + u_2(1 - a)$

Where a is the net area ratio, a lab calibration of the cone typically between 0.70 and 0.85

Pore Pressure, u
Pore pressure measured during penetration
u_1 - sensor on the face of the cone
u_2 - sensor on the shoulder (more common)

Sleeve Friction, f_s
Frictional force acting on the sleeve divided by its surface area

Normalized Friction Ratio, F_r
The ratio as a percentage of f_s to q_t, accounting for overburden pressure

To be reported per ASTM D7400, if collected:

Shear Wave Velocity, V_s
Measured in a Seismic CPT and provides direct measure of soil stiffness

DESCRIPTION OF GEOTECHNICAL CORRELATIONS

Normalized Tip Resistance, Q_{tn}
$Q_{tn} = ((q_t - \sigma_{v0})/P_a)(P_a/\sigma'_{v0})^n$
$n = 0.381(I_c) + 0.05(\sigma'_{v0}/P_a) - 0.15$

Over Consolidation Ratio, OCR
$OCR\ (1) = 0.25(Q_{tn})^{1.25}$
$OCR\ (2) = 0.33(Q_{tn})$

Undrained Shear Strength, S_u
$S_u = Q_{tn} \times \sigma'_{v0}/N_{kt}$
N_{kt} is a soil-specific factor (shown on S_u plot)

Sensitivity, S_t
$S_t = (q_t - \sigma_{v0}/N_{kt}) \times (1/f_s)$

Effective Friction Angle, ϕ'
$\phi'\ (1) = \tan^{-1}(0.373[\log(q_c/\sigma'_{v0}) + 0.29])$
$\phi'\ (2) = 17.6 + 11[\log(Q_{tn})]$

Unit Weight, γ
$\gamma = (0.27[\log(F_r)]+0.36[\log(q_t/atm)]+1.236) \times \gamma_{water}$
σ_{v0} is taken as the incremental sum of the unit weights

Small Strain Shear Modulus, G_0
$G_0\ (1) = \rho V_s^2$
$G_0\ (2) = 0.015 \times 10^{(0.55Ic + 1.68)}(q_t - \sigma_{v0})$

Soil Behavior Type Index, I_c
$I_c = [(3.47 - \log(Q_{tn}))^2 + (\log(F_r) + 1.22)^2]^{0.5}$

SPT N_{60}
$N_{60} = (q_t/atm) / 10^{(1.1268 - 0.2817Ic)}$

Elastic Modulus, E_s (assumes $q/q_{ultimate} \sim 0.3$, i.e. FS = 3)
$E_s\ (1) = 2.6\psi G_0$ where $\psi = 0.56 - 0.33\log Q_{tn,clean\ sand}$
$E_s\ (2) = G_0$
$E_s\ (3) = 0.015 \times 10^{(0.55Ic + 1.68)}(q_t - \sigma_{v0})$
$E_s\ (4) = 2.5q_t$

Constrained Modulus, M
$M = \alpha_M(q_t - \sigma_{v0})$
For $I_c > 2.2$ (fine-grained soils)
$\alpha_M = Q_{tn}$ with maximum of 14
For $I_c < 2.2$ (coarse-grained soils)
$\alpha_M = 0.0188 \times 10^{(0.55Ic + 1.68)}$

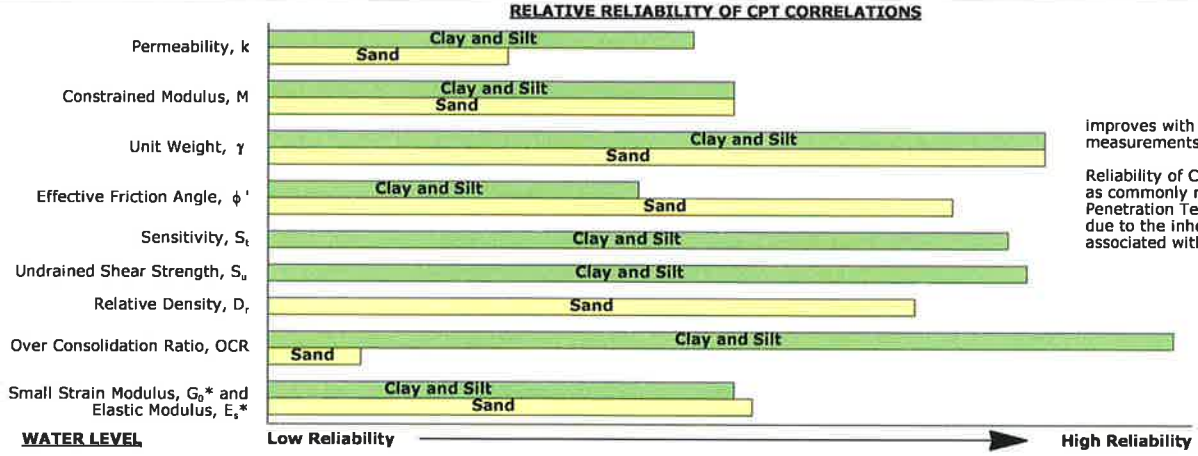
Hydraulic Conductivity, k
For $1.0 < I_c < 3.27$ $k = 10^{(0.952 - 3.04Ic)}$
For $3.27 < I_c < 4.0$ $k = 10^{(-4.52 - 1.37Ic)}$

Relative Density, D_r
$D_r = (Q_{tn} / 350)^{0.5} \times 100$

REPORTED PARAMETERS

CPT logs as provided, at a minimum, report the data as required by ASTM D5778 and ASTM D7400 (if applicable). This minimum data include q_t, f_s, and u. Other correlated parameters may also be provided. These other correlated parameters are interpretations of the measured data based upon published and reliable references, but they do not necessarily represent the actual values that would be derived from direct testing to determine the various parameters. To this end, more than one correlation to a given parameter may be provided. The following chart illustrates estimates of reliability associated with correlated parameters based upon the literature referenced below.

RELATIVE RELIABILITY OF CPT CORRELATIONS



improves with seismic V_s measurements

Reliability of CPT-predicted N_{60} values as commonly measured by the Standard Penetration Test (SPT) is not provided due to the inherent inaccuracy associated with the SPT test procedure.

WATER LEVEL

The groundwater level at the CPT location is used to normalize the measurements for vertical overburden pressures and as a result influences the normalized soil behavior type classification and correlated soil parameters. The water level may either be "measured" or "estimated:"

Measured - Depth to water directly measured in the field

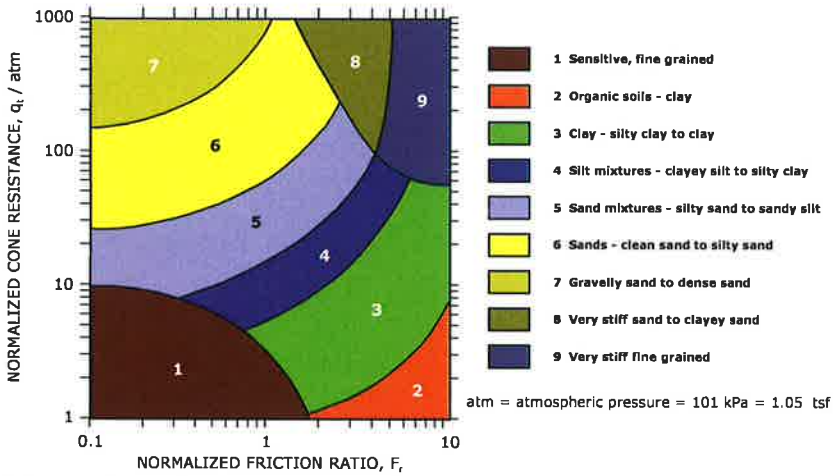
Estimated - Depth to water interpolated by the practitioner using pore pressure measurements in coarse grained soils and known site conditions

While groundwater levels displayed as "measured" more accurately represent site conditions at the time of testing than those "estimated," in either case the groundwater should be further defined prior to construction as groundwater level variations will occur over time.

CONE PENETRATION SOIL BEHAVIOR TYPE

The estimated stratigraphic profiles included in the CPT logs are based on relationships between corrected tip resistance (q_t), friction resistance (f_s), and porewater pressure (u_2). The normalized friction ratio (F_r) is used to classify the soil behavior type.

Typically, silts and clays have high F_r values and generate large excess penetration porewater pressures; sands have lower F_r's and do not generate excess penetration porewater pressures. The adjacent graph (Robertson *et al.*) presents the soil behavior type correlation used for the logs. This normalized SBT chart, generally considered the most reliable, does not use pore pressure to determine SBT due to its lack of repeatability in onshore CPTs.



atm = atmospheric pressure = 101 kPa = 1.05 tsf

REFERENCES

Kulhawy, F.H., Mayne, P.W., (1997). "Manual on Estimating Soil Properties for Foundation Design," Electric Power Research Institute, Palo Alto, CA.

Mayne, P.W., (2013). "Geotechnical Site Exploration in the Year 2013," Georgia Institue of Technology, Atlanta, GA.

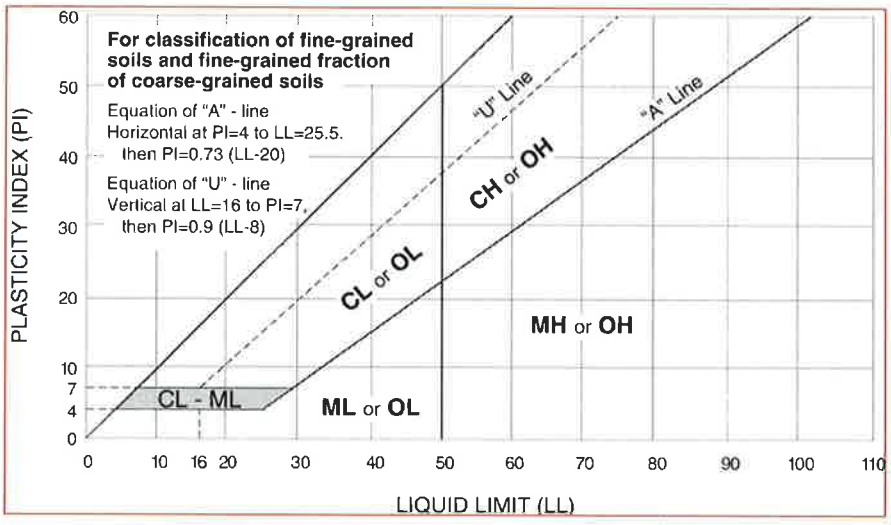
Robertson, P.K., Cabal, K.L. (2012). "Guide to Cone Penetration Testing for Geotechnical Engineering," Signal Hill, CA.

Schmertmann, J.H., (1970). "Static Cone to Compute Static Settlement over Sand,"*Journal of the Soil Mechanics and Foundations Division*,96(SM3), 1011-1043.

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N] / Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P] / Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



DIVISION 03

CONCRETE

SECTION 031000 - CONCRETE FORMWORK AND FORM ACCESSORIES

PART 1 - GENERAL

1.1 DESCRIPTION

This section covers design, construction, and treatment of formwork to confine and shape concrete to the required dimensions.

1.2 REFERENCE STANDARDS

A. ACI STANDARDS
ACI 117
ACI 301
ACI 318

B. ASTM STANDARDS
A 185-02
A 615-04b
C31 – 03a
C39 – 03
D994 – 98
D1751 – 99
FS
FS-SS-S-00210

1.3 SUBMITTALS

A. Formwork Release Agent: Submit data on the Formwork release agent proposed for use with each form surface to be used for acceptance unless otherwise specified in the Contract Documents.

B. Shop Drawings: When required by Contract Documents, submit shop drawings for Formwork.

C. Re-shoring: When re-shoring is permitted or required, submit for acceptance the plan of re-shoring procedures and operations in advance.

D. Control Joints for slabs on grade: If control joints are not shown in slabs on grade on the structural plans, the Contractor is to submit a drawing showing the proposed joint locations to the Architect for approval. Unless otherwise noted on the plans, control joints shall be spaced at 13' - 0" on center each way and shall be no closer than 5' - 0" from grade beam centerlines. Controls can be formed cold joints or saw joints. If saw joints are used the depth shall be as shown on the plans or 25% of the total slab depth. Saw joints shall be installed as soon as the concrete has cured enough such that the saw will not leave an impression on the concrete.

E. Control Joint Filler: Submit data on control joint filler to be used for acceptance.

F. Construction Joints: If construction joints other than those indicated in the contract documents are desired, submit a request for acceptance.

G. Vapor Barrier: Submit data on under-slab vapor barrier for acceptance.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Form-facing material shall be plywood, tempered concrete-form-grade hardboard, metal, plastic, paper or other acceptable material capable of producing the desired finish. Form-facing material shall produce a smooth, uniform texture on the concrete. Do not use form-facing material with raised grain, torn surfaces, worn edges, patches, dents, or other defects that will impair the texture of concrete surfaces.

B. Formwork Accessories: Use commercially manufactured accessories for formwork accessories that are partially or wholly embedded in concrete, including ties and hangers. Do not use non-fabricated wire form ties. Where indicated in the Contract Documents, use form ties with integral water barrier plates in walls.

C. Formwork Release Agents: Use commercially manufactured form release agents that will prevent formwork absorption of moisture, prevent bond with concrete, and not stain the concrete surfaces.

D. Expansion Joint Filler: Pre-molded expansion joint filler shall conform to ASTM D994, ASTM D1751, or ASTM D1752.

E. Control Joint Filler: Joint filler is to be either Euco Qwik Joint 200 manufactured by the Euclid Chemical Co., Joint Tite 750 manufactured by L & M Construction Chemicals, Inc., or Sikadur 51 SL manufactured by the Sika Corporation

F. Other Embedded Items: Sleeves, inserts, anchors, and other embedded items shall be of the material and design indicated in the Contract Documents.

G. Water Stops: Water stop materials shall be a single component, self-sealing adhesive compound, SF302 Synko-Flex water stop or an approved equal meeting the requirements of FS-SSS-210 and shall have a cross sectional area (as extruded) 1” x 1”. Cross section (as installed) 5/8” x 1-1/2”.

H. Rigid Foam Insulation: Lightweight inert compressible materials with a minimum density of 0.70 pounds per cubic foot and a minimum compressive resistance at 1% minimum deformation of 320 pounds per square foot. Rigid foam insulation shall cover the full width of the member above.

I. Cardboard Form Boxes: Form boxes are double wall corrugated fiber boards, laminated with water resistant adhesives and impregnated with waterproofing agents. Assembled

units shall be capable of safely supporting a sustained 350#/sq. ft. for a minimum of thirty-six (36) hours after concrete has been placed. Provide all accessories to prevent concrete intrusion into the form boxes. Assemble per manufacturer's recommendations.

J. Unless otherwise specified, provide minimum 15 mil vapor barrier under building slabs similar to WR Meadows Sealtight Perminator or Stego Wrap Vapor Barrier. Seal vapor barrier joints with tape as required by manufacturer.

2.2 PERFORMANCE AND DESIGN REQUIREMENTS

A. Design and engineering of formwork shall be the responsibility of the Contractor. When required by the Contract Documents, design of formwork and preparation of formwork drawings shall be under the supervision of a professional engineer registered in the state where the work will be done.

B. Design formwork for construction loads, lateral pressure, and requirements of the applicable building code. Design formwork to withstand the pressure resulting from placement and vibration of concrete and to maintain specified tolerances.

C. Do not use earth cuts as forms for vertical or sloping surfaces unless required or permitted by the Contract Documents.

D. Maximum deflection of facing materials reflected on concrete surfaces exposed to view shall be 1/240 of the span between structural members of the formwork except for architectural concrete.

E. Locate and detail formed joints to the following requirements:

Locate and form construction joints that least impair strength of the structure, and submit information for acceptance of proposed location and treatment of construction joints that are not indicated on the project drawings. In general, locate construction joints near the middle of the spans of slabs, beams, and girders. When a beam intersects a girder at this joint, the joint in the girder shall be offset a distance equal to or greater than twice the width of the beam. Located joints in walls and columns at the underside of floors, slabs, beams, or girders and at the tops of footings
or floor slabs. Make joints perpendicular to the main reinforcement.

F. Provide saw cut control joints in slabs on grade spaced at 12' – 6" maximum centers in both directions unless they are shown otherwise on the plans. Sawing is to begin as soon as the surface is firm enough so that it will not be torn or damaged by the blade.

G. For smooth form finish, arrangement of the facing material shall be orderly and symmetrical, with the number of seams kept to a practical minimum. Support facing material with studs or other backing capable of preventing excessive deflection within the tolerances specified.

2.3 FABRICATION AND MANUFACTURE

A. Formwork shall be tight to prevent loss of mortar from concrete. Provide watertight formwork when architectural concrete is specified.

B. Place 3/4" minimum chamfer strips in the corners of formwork to produce beveled edges on permanently exposed surfaces unless otherwise specified. Do not bevel re-entrant corners of edges of formed joints of concrete unless specified in the Contract Documents.

C. Provide temporary openings at the base of column and wall formwork and at other points where necessary to facilitate cleaning and inspection. Clean and inspect immediately before concrete is placed.

D. Fabricate form ties so ends or end fasteners can be removed, terminate the embedded portion of ties not less than (2) diameters, or twice the minimum cross-section dimension of the ties, from the formed concrete surface. In no case shall this distance be less than 3/4".

E. Locate water stops in joints where indicated on the Contract Documents. Use pieces of pre-molded water stop with a maximum practicable length to hold the number of end joints to a minimum. Make joints in water stops in accordance with the manufacturer's recommendations. Ensure that joints develop effective water tightness equal to the continuous water stop material, permanently develop not less than 50% of the mechanical strength of the parent section, and permanently retain flexibility.

PART 3 - EXECUTION

3.1 CONSTRUCTION AND ERECTION OF FORMWORK

A. At construction joints, lap contact surface of the form sheathing for flush surfaces exposed to view over the hardened concrete in the previous placement by not more than 1". Ensure formwork is held firmly against hardened concrete to prevent offsets or loss of mortar at construction joints and to maintain a true surface.

B. Unless specified in the Contract Documents, construct formwork so concrete surfaces conform to tolerance limits of ACI 117. The class of surface for offset between adjacent pieces of formwork facing material shall be Class C in accordance with ACI 117, unless otherwise specified.

C. Provide positive means of adjustment (wedges or jacks) of shores and struts. Do not make adjustments in the formwork after concrete has taken its initial set. Brace formwork securely against lateral deflection and lateral instability.

D. To maintain specified tolerances, camber formwork to compensate for anticipated deflections in formwork prior to hardening of concrete. Set formwork and intermediate screed strips for slabs accurately to produce designated elevations and contours of the finished surface prior to removal of formwork. Ensure that edge forms and screed strips are sufficiently strong to support vibrating screeds or roller pipe screeds when the finish specified requires the use of such equipment.

E. When formwork is cambered, set screeds to a like camber to maintain required concrete thickness.

F. Fasten form wedges in place after final adjustment of forms and prior to concrete placement.

G. Anchor formwork to shores, supporting surfaces, or members to prevent upward or lateral movement of the formwork system during concrete placement.

H. Construct formwork for wall openings to facilitate removal and to counteract swelling of wood formwork.

I. Provide runways for moving equipment and support runways directly on the formwork or structural member without resting on the reinforcing steel.

J. Place sleeves, inserts, anchors, and embedded items required for adjoining work or for support of adjoining work prior to concrete placement.

K. Position and support expansion joint material, water stops, and other embedded items to prevent displacement. Fill voids in sleeves, inserts, and anchor slots temporarily with readily removable material to prevent entry of concrete into voids.

L. Clean surfaces of formwork and embedded materials of mortar, grout, and foreign material before concrete is placed.

M. Cover surfaces of formwork with acceptable formwork release agent. Apply form release agent before placing reinforcing steel and concrete. A field-applied formwork release agent or sealer of an acceptable type or an acceptable factory-applied non-absorptive liner may be used. Do not allow formwork release agent to puddle in the forms. Do not allow formwork release agents to contact reinforcing steel or hardened concrete against which fresh concrete is to be placed.

3.2 REMOVAL FOR FORMWORK

A. When finishing is required, remove forms as soon as removal operations will not damage concrete.

B. Remove top forms on sloping surfaces of concrete as soon as removal will not allow concrete to sag. Perform needed repairs or treatment required at once and follow immediately with specified curing.

C. Loosen wood formwork for wall openings when this can be accomplished without causing damage to concrete.

D. Do not allow removal of formwork for columns, walls, sides of beams, and other parts not supporting the weight of the concrete to damage the concrete. Perform needed repair and treatment required on vertical surfaces at once and follow immediately with specified curing.

E. Unless otherwise specified, leave formwork and shoring in place to support the weight of concrete in beams, slabs, and in place structural members until concrete has reached the specified compressive strength, f_c=, or for no less than fourteen (14) days. If a lower compressive strength is proposed for removal for formwork and shoring, submit detail plans for review and acceptance, unless otherwise specified. When shores and other vertical supports are arranged to allow the form facing material to be removed without loosening or disturbing the shores and supports, the facing material may be removed after cumulative curing at not less than 50º F for twenty-four (24) hours after placing concrete, provided the concrete is sufficiently hard to not be damaged by form removal, and provided curing operations are maintained.

F. Construct formwork to permit easy removal.

3.3 RESHORING

A. When re-shoring is permitted or required, submit for acceptance a plan of re-shoring procedures and operations prior to their use.

B. While re-shoring is under way, do not permit any construction load on new construction.

C. During re-shoring, do not allow concrete in beam, slab, column, or any structural member to be loaded with combined dead and construction loads in excess of the loads permitted by the Architect/Engineer for the concrete compressive strength at the time of re-shoring.

D. Place re-shores in sequence with stripping operation.

E. Tighten re-shores to carry the required loads without over-stressing the concrete members. Leave re-shores in place until tests indicate that the concrete compressive strength has attained the minimum value specified.

F. For floors supporting shores under newly placed concrete, leave in place the original supporting shores or re-shore. The shoring or re-shoring system and the supporting slabs shall have capabilities sufficient to resist the anticipated loads. Re-shores shall be located directly under a shore position.

G. In multi-story buildings, extend re-shoring over a sufficient number of stories, two (2) stories minimum to distribute the weight of newly placed concrete, forms, and construction live loads.

3.4 STRENGTH OF CONCRETE REQUIRED FOR REMOVAL OF FORMWORK

When removal of formwork or re-shoring is based on concrete reaching a specified compressive strength, concrete will be presumed to have reached this strength when test cylinders, field cured along with the concrete they represent, have reached the compressive strength specified for removal of formwork or re-shoring. Mold cylinders in accordance with ASTM C 31, and cure them under the same conditions for moisture and temperatures as used for the concrete they represent. Test cylinders in accordance with ASTM C 39.

3.5 FIELD QUALITY CONTROL

A. Establish and maintain controls and bench marks in an undisturbed condition until final completion and acceptance of the project.

B. Variations from plumb and designated building lines shall not exceed the tolerances specified in ACI 117.

END OF SECTION 031000

SECTION 032000 – CONCRETE REINFORCEMENT & REINFORCEMENT SUPPORTS

PART 1 – DESCRIPTION

1.1 DESCRIPTION

This section covers materials, fabrication, placement and tolerances of reinforcement and reinforcement accessories.

1.2 REFERENCE STANDARDS

A. ACI STANDARDS
ACI 117
ACI 301
ACI 318

B. ASTM STANDARDS
A 185-02
A 615-04b

1.3 SUBMITTALS, DATA AND DRAWINGS

Unless otherwise required by Contract Documents, submit the following data and drawings for review and acceptance before fabrication and execution in accordance with the General Requirements of this project.

A. Placing Drawings: Submit placing drawings showing fabrication dimensions and locations for placement of reinforcement and reinforcement supports.

B. Splices: Submit a list and request to use splices not indicated in Contract Documents.

C. Mechanical Connections: Submit request for the use of mechanical connections not shown on the Project Drawings.

D. Field Bending: Submit requests and procedure to field bend or straighten reinforcement partially embedded in concrete.

1.4 MATERIALS DELIVERY, STORAGE, AND HANDLING

Prevent bending, coating with earth, oil, or other material, or otherwise damaging the reinforcement.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Reinforcing Bars: Bars used as reinforcement shall be deformed except spirals and welded wire fabric, which may be plain. Reinforcement shall be ASTM A 615 Grade 60. Provide weldable Grade 60 reinforcement where bars are called for or required to be welded.

B. Welded Wire Fabric: ASTM A 185, with welded intersections spaced not farther apart than twelve (12) inches in the direction of principal reinforcement.

C. Wire Reinforcement Supports: Unless otherwise specified or permitted, use wire reinforcement supports complying with Class 1, maximum protection, or Class 2, moderate protection as indicated in Chapter 3 - Bar Supports of the CRSI Manual of Standard Practice.

D. Unless otherwise noted, provide corner bars at all bar intersections. Corner bars shall be the same size as the larger of the intersecting bars and each leg shall be forty-four (44) bar diameters in length.

2.2 FABRICATION

Bend all reinforcement cold unless heating is permitted. Fabricate reinforcement in accordance with fabricating tolerances of ACI 117.

PART 3 – EXECUTION

3.1 PREPARATION

When concrete is placed, all reinforcement shall be free of materials deleterious to bond. Reinforcement with rust, mill scale, or a combination of both will be considered satisfactory provided the minimum nominal dimensions, nominal weight, and the minimum average height of deformations of a hand-wire-brushed test specimen are not less than the applicable ASTM specification requirements.

3.2 PLACEMENT

A. Tolerances: Place, support, and fasten reinforcement as shown on the Project Drawings. Do not exceed the placing tolerances specified in ACI 117 before concrete is placed. Placing tolerances shall not reduce cover requirements except as specified in ACI 117.

B. Reinforcement Relocation: When necessary to move reinforcement beyond the specified placing tolerances to avoid interference with other reinforcement, conduits, or embedded items, submit the resulting arrangement of reinforcement for acceptance.

C. Concrete Cover: Minimum concrete cover for reinforcement shall be in accordance with the latest edition of ACI 318 - BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE. Tolerances on minimum concrete cover shall meet the requirements of ACI 117.

D. Reinforcement supports: Unless otherwise permitted:

1. Place reinforcement supported from the ground or mud mat on precast concrete reinforcement supports.

2. Place reinforcement supported from formwork on reinforcement supports made of concrete, metal, or plastic.

E. Welded wire fabric: For slabs on grade, extend welded wire fabric to within two (2) inches of the concrete edge. Lap edges and ends of fabric sheets a minimum of one (1) mesh spacing. Welded wire fabric may extend through contraction joints only where permitted. Support welded wire fabric during placing of concrete to assure required positioning in the slab. Do not place welded wire fabric on grade and subsequently raise into position in concrete.

F. Column dowels: Furnish and use templates for placement of column dowels unless otherwise permitted.

G. Make splices as indicated on the Project Drawings unless otherwise permitted. Mechanical connections for reinforcement not shown on the Project Drawings may be used when accepted.

H. Field bending or straightening: When permitted, bend or straighten reinforcement partially embedded in concrete in accordance with the following procedures. Reinforcing bar sizes No. 3 through No. 5 may be bent cold the first time provided reinforcing bar temperature is above 32º F.

I. Minimum inside bend diameters shall be six (6) bar diameters for No. 3 through No. 8 bars, eight (8) bar diameters for No. 9 through No. 11 bars, and ten (10) bar diameters for No. 14 and No. 18 bars. In addition, beginning of the bend shall not be closer to the concrete surface than the minimum diameter of bend.

J. Field cutting of reinforcement: Reinforcement shall not be cut in the field except when specifically permitted.

K. Reinforcement through expansion joint: Do not continue reinforcement or other embedded metal items bonded to concrete through expansion joints. Dowels bonded on only one (1) side of a joint and water stops may extend through the joint.

END OF SECTION 032000

SECTION 033000 – CAST-IN-PLACE CONCRETE

PART 1 – GENERAL REQUIREMENTS

1.1 DESCRIPTION

This section covers design, delivery, placement, and testing for cast-in-place concrete mixed without fly ash.

1.2 REFERENCE STANDARDS

A. ACI STANDARDS:

ACI 117
ACI 301
ACI 318

B. ASTM STANDARDS

A 185–02
A 615-04b
C 31-03a
C 33-03
C 39-03
C 42-04
C 94-04
C 138-01
C 143-03
C 150-04a
C 171-03
C 172-04
C 173-01
C 192-02
C 231-04
C 260-01
C 309-03
C 494-04
C 595-03
C 597-02
C 805-02
C 1017-03
C 1064-04
C 1077-02
E 1155-14

C. AASHTO T260-84

1.3 SUBMITTALS

A. General – Submittals required in this specification shall be submitted for review and acceptance.

B. Product Data – Submit manufacturer's product data with application and installation instructions for proprietary materials and items, admixtures, patching compounds, curing compounds, and others as requested by the Architect.

C. Testing and Inspection Reports – Testing agencies shall report results of concrete and concrete materials tests and inspections performed during the course of the work to the Owner, Architect/Engineer, Contractor, and the Concrete Supplier. Strength test reports shall include location in the work where the batch represented by test was deposited and the batch ticket number. Final reports shall be provided within (7) days of test completion.

1.4 QUALITY ASSURANCE

A. General – Concrete materials and operations may be tested and inspected by the Testing Agency as work progresses. Failure to detect defective work or material will not prevent rejection later when a defect is discovered, nor shall it obligate the Architect/Engineer for final acceptance.

B. Testing Agencies – Agencies that perform testing services on concrete materials shall meet the requirements of ASTM C 1077. Testing agencies performing the test shall be acceptable to the Architect/Engineer prior to performing any work. Field tests of concrete shall be made by an ACI Concrete Field Testing Technician Grade 1 in accordance with ACI CP1 or equivalent. Equivalent certification programs shall include requirements for written and performance examinations as stipulated in ACI Publication CP1.

C. Testing Responsibilities of Contractor:

1. Submit data on qualifications of proposed testing agency for acceptance. Use of testing services will not relieve the Contractor of the responsibility to furnish materials and construction in full compliance with the Contract Documents.

2. Duties and Responsibilities: Unless otherwise specified in the Contract Documents, the Contractor shall assume the following duties and responsibilities:

    a. Qualify proposed materials and establish mixture proportions.
    b. Furnish any necessary labor to assist the testing agency in obtaining and handling samples at the project site or at the source of the materials.
    c. Advise the testing agency at least (24) hours in advance of operations to allow for completion of quality tests and for assignment of personnel.
    d. Provide and maintain for the sole use of the testing agency adequate facilities for safe storage and proper curing of concrete test specimens on the job site for initial curing as required by ASTM C 31.
    e. Submit data and test documentation on materials and mixture proportions.
    f. Submit quality control program of the concrete supplier and provide copies of all test reports.

D. Testing Services – The testing agency shall perform the following testing services:

1. Obtain composite samples in accordance with ASTM C 172. Each sample shall be obtained from a different batch of concrete on a random basis, avoiding any selection of the test batch other than by a number selected at random before commencement of concrete placement. Obtain at least (1) composite sample for each (50) yd^3, or fraction thereof, of each design mixture of concrete placed in any (1) day. When the total quantity of concrete with a given design mixture is less than (25) yd^3, the strength tests may be waived by the Architect/Engineer, if in his judgment, adequate evidence of satisfactory strength is provided.
2. Conduct strength tests of concrete during construction in accordance with the following procedures:
    a. Mold and cure (4) cylinders from each sample in accordance with ASTM C 31. Record any deviations from the ASTM requirements in the test report.
    b. Test cylinders in accordance with ASTM C 39. Test (1) specimen at (7) days for information, (2) specimens at (28) days for acceptance, and hold (1) specimen to be tested as directed by the Architect/Engineer. The compressive strength test results for acceptance shall be the average of the compressive strengths from the (2) specimens tested at (28) days.
3. Determine slump of each composite sample and whenever consistency of concrete appears to vary, using ASTM C 143. In addition, the testing laboratory shall also perform a slump test on every truck. ESTIMATING SLUMP IS NOT ALLOWED.
4. Determine temperature of each composite sample in accordance with ASTM C 1064.
5. Air content tests will be made on samples from the first (3) batches in the placement and until (3) consecutive batches have air contents within the range specified at which time (1) test will be performed for each (100) cubic yards or fraction thereof of each design mixture of concrete placed in any (1) day. This test frequency will be maintained until a batch is not within the range specified, at which time testing of each batch will be resumed until (3) consecutive batches have air contents within the range specified. Additional tests may be performed as necessary for control. These air content tests may be taken on composite samples or on samples from the batch at any time after discharge of (2) cubic feet of concrete.
6. The floor flatness (FF) and floor levelness (FL) shall be tested in accordance with ASTM E1155-14.
7. When it appears that material furnished or work performed by the Contractor fails to conform to the Contract Documents, testing agency will immediately report such deficiency to the Architect/Engineer, Contractor, and concrete supplier.
8. Testing agency and its representatives are not authorized to revoke, alter, relax, enlarge, or release any requirement of the Contract Documents, nor to accept any portion of the work.
9. Testing agency will report all test and inspection results to Architect/Engineer, Contractor and concrete supplier within (7) days after tests and inspections are performed.

E. Additional Testing and Inspection Services

1. The testing agency shall perform the following testing services when necessary, at the Contractor's expense:
    a. Additional testing and inspection required because of changes in materials or mixture proportions requested by the Contractor.

b. Additional testing of materials or concrete occasioned by failure to meet specification requirements.

2. When material furnished or work performed by the Contractor fails to conform to the Contract Documents, the testing agency will perform the following testing services when require by the Architect/Engineer at the Contractor's expense:
   a. Inspect concrete batching, mixing, and delivery operations.
   b. Other testing or inspection services as required by the Architect/Engineer.

F. Tests on Hardened Concrete in Place

1. General: Tests on hardened concrete will be performed by the testing agency when such tests are needed. Testing shall be at the Contractor's expense when tests are performed to verify the strength of the structure when required by this specification. Owner will pay costs if tests are at his request and not required by this specification.
2. Non-Destructive Tests: Use of the rebound hammer in accordance with ASTM C 805, pulse velocity methods in accordance with ASTM C 597, or other non-destructive devices may be permitted by the Architect/Engineer in evaluating the uniformity and relative concrete strength in place, or for selecting areas to be cored.
3. Core Tests
   a. When required by the Architect/Engineer, cores shall be obtained and tested in accordance with ASTM C 42.
   b. At least (3) representative cores shall be taken from each member or area of concrete in place that is considered potentially deficient. The location of cores is to be determined by the Architect/Engineer. If, before testing, cores show evidence of having been damaged subsequent to or during removal from the structure, replacement cores shall be taken.
   c. Fill core holes with low slump concrete or grout of a strength equal to or greater than the original concrete.

G. Evaluation of Concrete Strength Tests

1. Standard molded and cured strength specimens: Test results from standard molded and cured test cylinders shall be evaluated separately for each specified concrete design mixture. Evaluation will be valid only if tests have been conducted in accordance with procedures specified. For evaluation, each specified design mixture shall be represented by at least (5) tests.
2. Non-destructive tests: Test results will be evaluated by the Architect/Engineer and will be valid only if tests have been conducted by properly calibrated equipment in accordance with recognized standard procedures.
3. Core tests: Core tests will be evaluated by the Architect/Engineer and will be valid only if tests have been conducted in accordance with specified procedures.

H. Acceptance of Concrete Strength

1. Standard molded and cured strength specimens: The strength level of concrete will be considered satisfactory when the averages of all sets of (3) consecutive compressive strength test results equal or exceed the specified compressive strength f_c= and no individual strength test result falls below the specified compressive strength f_c= by more than (500) psi.

2. Non-destructive tests: Non-destructive tests shall not be used as the sole basis for accepting or rejecting concrete, but may be used when permitted to evaluate concrete where standard molded and cured cylinders have yielded results not meeting the criteria in Paragraph 1.
3. Core tests: Strength level of concrete in the area represented by core tests will be considered adequate when the average compressive strength of the cores are equal to at least 85 percent of specified compressive strength f_c=, and if no single core is less than 75 percent of the specified compressive strength, f_c=.

I. Field Acceptance of Concrete

1. Air content: Concrete not within the limits of the air-entrainment specified shall not be used in the work.
2. Slump: Concrete not within the slump limits specified at the point of placement shall not be used in the work.
3. Temperature: Concrete not within temperature limits specified shall not be used in the work.

1.5 ACCEPTANCE OF STRUCTURE

A. General – Completed concrete work shall conform to applicable requirements of this Specification.

1. Concrete work that fails to meet (1) or more requirements of the Contract Documents but subsequently is repaired to bring the concrete into compliance may be accepted.
2. Concrete work that fails to meet (1) or more requirements of the Contract Documents and cannot be brought into compliance will be rejected.
3. Repair rejected concrete work by removing and replacing or by reinforcing with additional construction required by the Architect/Engineer.
4. Submit for acceptance the proposed repair methods, materials, and modifications needed to assure that concrete work will meet requirements of the Contract Documents.
5. Document repair work to bring concrete work into compliance with the Contract Documents and submit the documentation to the Architect/Engineer for acceptance.
6. Contractor shall pay all costs to bring concrete work into compliance with requirements of the specification.
7. Concrete members cast in the wrong location will be rejected.

B. Dimensional Tolerances

1. Formed surfaces resulting in concrete outlines smaller than permitted by the tolerances of ACI 117, may be considered deficient in strength and subject to the provisions of Paragraph D, Strength of Structure.
2. Formed surfaces resulting in concrete outlines larger than permitted by ACI 117 may be rejected. Excess materials will be subject to removal when required by the Architect/Engineer.
3. Inaccurately formed concrete surfaces that exceed ACI 117 tolerances may be rejected.
4. Concrete with tolerances and defects exceeding the specified limitations may be rejected.

C. Appearance

1. Concrete exposed to view with defects that adversely affect the appearance of the specified finish will be rejected.
2. Concrete exposed to view may be rejected for non-conforming appearance.

D. Strength of Structure

1. Criteria for determining potential strength deficience: Strength will be considered deficient and concrete work will be rejected when the work fails to comply with requirements which control the strength of the structure including, but not limited to, the following conditions:
   a. Concrete strength failing to comply with requirements of the Contract Documents.
   b. Reinforcing steel size, quantity, strength, position, or arrangement at variance with the requirements of the Contract Documents.
   c. Concrete elements which differ from the required dimensions or location.
   d. Curing not in accordance with Contract Documents.
   e. Inadequate protection of concrete from extreme temperature and other environmental
      conditions during early stages of hardening and strength development.
   f. Mechanical injury, construction fires, accidents, or premature removal of formwork resulting in deficient strength.
2. Action required when strength is potentially deficient: When strength of the structure is considered potentially deficient, corrective actions may be required by the Architect/Engineer.

E. Durability

1. Criteria for determining potential durability deficiency: Durability of concrete work will be considered deficient and the concrete work will be rejected when it fails to comply with the requirements which control durability of the structure including, but not limited to, the following conditions:
   a. Strength failing to comply with that specified.
   b. Materials for concrete not conforming with the specifications for Cements, Aggregated, Water, and Admixtures, including air entrainment.
   c. Concrete not conforming with the air-entrainment requirements in the Contract Documents.
   d. Curing not in accordance with the Contract Documents.
   e. Inadequate protection of concrete from temperature and other environmental conditions during early stages of hardening and strength development.
2. Action required when durability is potentially deficient: When durability of the structure is considered to be deficient, the following actions will be taken by the Architect/Engineer:
   a. Require that samples of the ingredient materials used in the concrete be obtained and tested.
   b. Require that samples of hardened concrete be obtained from the structure by coring, sawing, or other acceptable means.
   c. Require a laboratory evaluation of concrete and concrete materials to assess the ability of concrete to resist weathering action, chemical attack, abrasion, or other deterioration.
   d. Concrete rejected for lack of durability shall be repaired or replaced as directed by the Architect/Engineer.

1.6 PROTECTION OF IN-PLACE CONCRETE

A. Loading and support of concrete – Do not allow construction loads to exceed the superimposed load which the structural member, with necessary supplemental support, is capable of carrying safely and without damage.

B. Protection from mechanical injury – During the curing period, protect concrete from damaging mechanical disturbances including load stresses, shock and harmful vibration. Protect concrete surfaces from damage by construction traffic, equipment, materials, rain or running water, and other adverse weather conditions.

PART 2 – CONCRETE MIXTURES

2.1 DESCRIPTION

Requirements for materials, proportioning, production, and delivery of concrete.

2.2 SUBMITTALS

A. Mixture proportions – Submit concrete mixture proportions by weight.

B. Concrete materials – Submit the following information for concrete materials:

1. For cementious material: types, classes.
2. For aggregates: types, pit or quarry locations, producer's names, gradations, specific gravities.
3. For admixtures: types, brand names, producers.
4. For water and ice: source of supply.

C. Mixture proportion adjustments – Submit any adjustments to mixture proportions or changes in materials, along with supporting documentation, made during the course of the work.

D. Time of discharge – When it is desired to exceed time for discharge of concrete required by ASTM C 94, submit a request along with a description of the precautions to be taken.

2.3 PRODUCTS

A. Materials

1. Cementious material – Unless otherwise specified, cementious material shall conform to ASTM C 150 Type I or Type II without the addition of cementious or pozzolanic mineral admixtures. Cementious material used in concrete shall be of the same brand and type, and from the same plant of manufacture as the cementious material used in the concrete represented by the submitted field test data or used in the trial mixtures. The use of fly ash or slag is not allowed.

2. Aggregates – Aggregates shall conform to ASTM C 33 unless otherwise specified. When a single size or a combination of (2) or more sizes of coarse aggregates are used, the final gradation shall conform to the grading requirements of ASTM C 33 unless otherwise specified or permitted.
3. Water and ice – Mixing water for concrete and water used to make ice shall meet the requirements of ASTM C 94.
4. Admixtures – When required or permitted, admixtures shall meet the requirements of the following:
    a. Air entraining admixtures – ASTM C 260.
    b. Chemical admixtures – ASTM C 494.
    c. Chemical admixtures for use in producing flowing concrete – ASTM C 1017.
5. Change of materials – When brand, type, size, or source of cementious materials, aggregates, water, ice, or admixtures are proposed to be changed, new data or evidence which indicates that the change will not adversely affect the relevant properties of the concrete shall be submitted for acceptance prior to use in concrete.

B. Performance and Design Requirements

1. Cementious material content – The cementious material content shall be adequate for concrete to satisfy the specified requirements for strength, water-cementious material ratio and finishing ability.
2. Slump – Slump shall not exceed the specified slump. Concrete shall have, at the point of delivery, a slump of:
    a. Ramps and sloping surfaces – 3” maximum.
    b. Reinforced foundations – 1” minimum to 3” maximum.
    c. Other concrete – 2” minimum to 4” maximum
    d. Determine the slump by ASTM C 143. Slump tolerances shall meet the requirements of ACI 117. When use of a plasticing admixture conforming to ASTM C 1017 or when a Type F or G high range water reducing admixture conforming to ASTM C 494 is permitted to increase the slump of concrete, concrete shall have a slump of (2) to (4) inches before the admixture is added and a maximum slump of (6) inches at the point of delivery after the admixture is added, unless otherwise specified.
3. Size of coarse aggregate – Except when otherwise specified or permitted, nominal maximum size of coarse aggregate shall not exceed three-fourths of the minimum clear spacing between reinforcing bars, one-fifth of the narrowest dimensions between sides of forms, or one-third of the thickness of slabs or toppings.
4. Air content – See plans for air-entrainment requirements. Unless otherwise specified, air content for exterior exposed concrete at the point of delivery shall conform to the requirements of ACI – 301, Table 4.2.2.4 for mild exposure. For specified compressive strengths above 5,000 psi, the total air contents indicated in Table 4.2.2.4 may be reduced by (1) percent.
5. Chloride ion concentration – Unless otherwise specified, maximum water soluble chloride ion concentrations in hardened concrete at ages from (28) to (42) days contributed from the ingredients including water, aggregates, cementious materials, and admixtures shall not exceed .30% by weight of cement. When testing is performed to determine water soluble chloride ion content, test procedures shall conform to AASHTO T 260.
6. Concrete temperature – When the average of the highest and lowest temperature during the period from midnight to midnight is expected to drop below 40° F for more than (3) consecutive days, concrete shall be delivered to meet the following minimum temperature immediately after placement.

- 55° F for sections less than (12) inches in the least dimension.
- 50° F for sections (12) inches to (36) inches in the least dimension.
- 45° F for sections (36) inches to (72) inches in the least dimension.
- 40° F for sections greater than (72) inches in the least dimension.

The temperature of concrete as placed shall not exceed these values by more than 20° F. These minimum requirements may be terminated when temperatures above 50° F occur during more than half of any (24) hour duration. Unless otherwise specified or permitted, the temperature of concrete as delivered shall not exceed 90° F.

7. Strength – The compressive strength is to be as specified on the drawings. Unless otherwise specified, strength requirements shall be based on the (28)-day compressive strength determined on a (6) x (12) inch cylindrical specimens made and tested in accordance with ASTM C 31 and C 39 respectively.
8. Water-cementious material ratio – The water-cement or water-cementious material ratio of the concrete for each portion of the work shall not exceed .50 for 3,000 psi concrete and .48 for higher strength concrete.
9. Proportioning – Proportion concrete to conform with Paragraph C – Performance and Design Requirements, to provide workability and consistency so concrete can be worked readily into forms and around reinforcement without segregation or bleeding, and to provide the compressive strength specified.

2.4 EXECUTION

A. Measuring, batching, and mixing – Production facilities shall produce concrete of the specified quality and conforming to the requirements of this Specification. Unless otherwise specified, measure, batch and mix concrete materials and concrete in conformance with ASTM C 94.

B. Delivery – Deliver concrete which will possess the specified characteristics in the freshly mixed state at the point of placing. Transport and deliver concrete in equipment conforming to the requirements of ASTM C 94.
   1. Slump adjustment – When concrete arrives at the point of delivery with a slump below that which will result in the specified slump at the point of placement and is unsuitable for placing at that slump, the slump may be adjusted to the required value by adding water up to the amount allowed in the accepted mixture proportions unless otherwise specified by the Architect/Engineer. Addition of water shall be in accordance with ASTM C 94. Do not exceed the specified water-cementious material ratio or slump. Do not add water to concrete delivered in equipment not acceptable for mixing. After plasticizing or high-range water-reducing admixtures are added to the concrete at the site to achieve flowable concrete, do not add water to the concrete. Measure slump and air content of air-entrained concrete, after slump adjustment, to verify compliance with specified requirements.
   2. Time of discharge – Time for completion of discharge shall be as specified by ASTM C 94,unless otherwise permitted. When discharge is permitted after more than (90) minutes have elapsed since batching or after the drum has revolved (300) revolutions, verify that air content of air-entrained concrete, slump, and temperature of concrete are as specified.

PART 3 – HANDLING, PLACING, AND CONSTRUCTIONG

3.1 EXECUTION

A. Preparation

1. Do not place concrete until data on materials and mixture proportions are accepted.
2. Before placing concrete in forms, complete the following:
   a. Comply with formwork requirements specified.
   b. Remove dirt, water, and other foreign material from surfaces, including reinforcement and embedded items, against which concrete will be placed.
   c. Comply with reinforcing steel placement requirements specified.
   d. Position and secure in place expansion joint material, anchors, and other embedded items.
   e. Obtain acceptance of finished preparation.
3. Before placing a concrete slab on grade, clean foreign material from the Subgrade and complete the following:
   a. In-place density of Subgrade soils shall be uniform throughout the area and at least the minimum required by the Contract Documents.
   b. Subgrade shall be free from frost or ice.
   c. Subgrade shall be moist with no free water and no muddy or soft spots.
4. When high ambient temperatures necessitate protection of concrete immediately after placing or finishing, make provisions in advance of concrete placement for windbreaks, shading, fogging, sprinkling, ponding, or wet covering.
5. During ambient temperature conditions described in Section 2.03, Paragraph B, Subparagraph 6 – Concrete Temperature, make provisions in advance of concrete placement to maintain the temperature of the concrete as specified. Use heating, covering, or other means adequate to maintain required temperature without overheating or drying of concrete due to concentration of heat. Do not use combustion heaters unless precautions are taken to prevent exposure of the concrete to exhaust gases containing carbon dioxide.

B. Placement of concrete.

1. Wet weather – Do not begin to place concrete while rain, sleet, or snow is falling. Do not allow rain water to increase mixing water or to damage the surface of the concrete.
2. Cold weather – Concrete temperatures and ambient temperatures shall meet minimum temperature requirements of Section 2.03, Paragraph B, Sub-Paragraph 6 – Concrete Temperature.
3. Hot weather – The temperature of concrete as placed shall not exceed 90° F unless otherwise permitted. Loss of slump, flash set, or cold joints due to temperature of concrete as placed will not be acceptable. When temperature of concrete exceeds 90° F, obtain acceptance, when required, of proposed precautionary measures. When temperature of steel reinforcement, embedments, or forms is greater than 120° F, fog steel reinforcement, embedments, and forms with water immediately prior to placing concrete.
4. Conveying – Convey concrete from mixer to the place of final deposit rapidly by methods which prevent segregation or loss of ingredients and will assure the required quality of concrete. Do not use aluminum pipes or chutes.
5. Depositing – Deposit concrete continuously in (1) layer or in layers to have fresh concrete deposited on in-place concrete that is still plastic. Do not deposit fresh concrete on concrete that has hardened sufficiently to cause formation of seams or planes of

weakness within the section, unless construction joint requirements are met. Do not use concrete that has surface dried, partially hardened, or contains foreign material. Do not subject concrete to any procedure that will cause segregation. Deposit concrete as near as practicable to the final position to avoid segregation.

6. Consolidating – Consolidate concrete by vibration. Concrete shall be thoroughly worked around reinforcement and embedded items and into corners of forms, eliminating all air or stone pockets which may cause honey-combing, pitting, or planes of weakness. Use internal vibrators of the largest size and power that can properly be used in the work as described in ACI – 301, Table 5.3.2.5. Workers shall be experienced in use of the vibrators. Do not use vibrators to move concrete within the forms.
7. Construction joints and other bonded joints – Locate construction joints as indicated on the Project Drawings or as accepted by the Architect/Engineer.

C. Finished formed surfaces – After removal of forms, give each formed surface (1) or more of the finishes as specified by the Architect/Engineer. Finishes are to be in accordance with ACI – 301, Section 5.3.3.

D. Finishing unformed surfaces – Place concrete at a rate that allows spreading, straight edging, and darbying or bullfloating before bleed water appears. Strike smooth the top of walls, buttresses, horizontal offsets, and other similar unformed surfaces and float them to a texture consistent with finish of adjacent formed surface. Finish slab surfaces as specified by the Architect/Engineer. Finishes are to be in accordance with ACI – 301. Flatness shall be $F_F = 20$ and levelness shall be $F_L = 15$ unless noted otherwise in the Construction Documents and shall meet the requirements of ACI – 117.

E. Sawed control joints – Where saw cut joints are required or permitted, start cutting as soon as concrete has hardened sufficiently to prevent dislodgement of aggregates. Saw a continuous slot to a depth of one-fourth the thickness of the slab but not less than (1) inch. Complete sawing within (12) hours after placement.

F. Curing and protection

1. General – Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury. Protect concrete during the curing period such that the concrete temperature does not fall below the requirements of Section 2.03, Paragraph B, Sub-Paragraph 6 – Concrete Temperature. Cure concrete in accordance with ACI – 301, 5.3.6.2 or 5.3.6.3 for (7) days after placement.
2. Formed concrete surfaces – Keep absorbent wood forms wet until they are removed. After form removal, cure concrete by (1) of the methods in Sub-Paragraph 3 – Unformed Concrete Surfaces.
3. Unformed concrete surfaces – After placing and finishing, use (1) or more of the following methods to preserve moisture in concrete:
    a. Ponding, continuous fogging or continuous sprinkling.
    b. Application of mats or fabric kept continuously wet.
    c. Continuous application of steam (under 150° F).
    d. Application of sheet materials conforming to ASTM C 171.
    e. Application of a curing compound conforming to ASTM C 309. Apply the compound in accordance with manufacturer's recommendation after water sheen has disappeared from the concrete surface and after finishing operations. The rate of application shall not exceed 200 ft^2/gal. For rough surfaces, apply in (2) applications at right angles to each other, not to exceed 200 ft^2/gal. for each coat. Do not use

curing compound on any surface where concrete or other material will be bonded unless the curing compound will not prevent bond or unless measures are to be taken to completely remove the curing compound from areas to receive bonded applications.

f. When the ambient temperature exceeds 90° F, either ponding, continuous fogging, continuous sprinkling or application of mats or fabric kept continuously wet are required for curing. Other methods of curing are not allowed.

G. Repair of surface defects: Repair tie holes and surface defects immediately after form removal. Where the concrete surface will be textured by sandblasting or bush-hammering, repair surface defects before texturing. Repairs are to meet the requirement of ACI – 301, Section 5.3.7.

END OF SECTION 033000

SECTION 033300 – POST-TENSIONED CONCRETE

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Design of the un-bonded single strand post-tensioning system as indicated in the plans and specifications to comply with ACI 301 – 05 and ACI 318 – 05.

B. The fabrication and delivery of the post-tensioning materials and equipment.

C. The installation and tensioning of the post-tensioning system.

D. See also Division 03300 Cast-in-Place Concrete.

1.2 APPLICABLE STANDARDS

A. American Concrete Institute (ACI)

ACI 423.3R – 05	Recommendations for concrete members pre-stressed with un-bonded tendons.
ACI 423.6R – 01	Specifications for un-bonded single strand tendons.

B. American Society for Testing & Materials (ASTM):

ASTM A 416 – 02	Standard specification for steel strand, un-coated seven-wire for pre-stressed concrete.

C. Post-Tensioning Institute – Post-Tensioning Manual – Sixth Edition

1.3 QUALITY ASSURANCE

A. The post-tensioning system installer shall have a minimum of (5) years of post-tensioning experience and shall have completed at least (5) projects of similar or greater magnitude.

B. The Contractor's superintendent and the installer's supervisor shall both have a minimum of (5) years experience with similar post-tensioned projects and shall have each supervised (5) post-tensioned projects of similar or larger magnitude.

C. The post-tensioning supplier shall provide an experienced and knowledgeable representative to review the layout and installation of the post-tensioning system, the stressing procedure, the measurement of the tendon elongations, the cutting of the excess tendons, and the grouting of the stressing pockets for the first concrete pour.

D. Stressing records shall be filled out during the tensioning operation, containing the minimum following data:

1. Tendon location and identification.
2. Date stressed.
3. Jack and gauge serial numbers.
4. Gauge pressure to achieve required stressing force per supplied calibration chart.
5. Actual gage pressure.
6. Elongation (theoretical and achieved).
7. Stressing sequence.
8. Stressing mode (one end/two ends).
9. Name and signature of stressing operator or supervisor.

E. A recognized testing laboratory approved by the Architect and Structural Engineer is to measure and record the elongation of all tendons at each stressing location.

1.4 SUBMITTALS

A. Submit to the Architect for record, calculations prepared by a qualified professional engineer registered in the State of Louisiana. The calculations shall account for all losses including anchorage seating, elastic shorting, creep, shrinkage, relaxation, friction and wobble used in the selection of tendon size and spacing.

B. Submit drawings in accordance with ACI 301.9.1.2.1a showing tendon size and placement, supports, stressing ends, anchorage ends, pressure plate stresses, placing sequence, stressing force, calculated elongation, stressing sequence, etc. for Architect/Engineer review.

C. Submit (5) sets of post-tension systems components manufacturer's product data, including quality control measures, with application and installation instructions.

D. Certified mill test reports shall be furnished upon request for each coil or pack of strands. Submit a sample containing as a minimum the following test information:

1. Heat number and identification.
2. Ultimate tensile strength.
3. Yield stress at 1% extension under load.
4. Elongation at failure.
5. Modulus of elasticity.
6. Diameter of net area of the strand.
7. Type of material (stress-relieved or low relaxation).

E. Submit to the Architect for record certified jack and gauge combination calibrations and serial numbers. Certification is to be within (6) months of use and is to be provided by a qualified testing laboratory.

F. Submit to the Architect for record the post-tensioning experience of the Contractor, the Contractor's superintendent, the post-tensioning installer, and the installer's supervisor.

PART 2 – PRODUCTS

2.1 CONCRETE MATERIALS – SEE DIVISION 03300 CAST-IN-PLACE CONCRETE

2.2 TENDONS

A. Un-bonded single-strand tendons shall be fabricated in accordance with ACI 423.6.1.6.

B. Pre-stressing steel used in single-strand un-bonded post-tensioning tendons shall conform to ASTM A-416 Grade 270K, stress relieved or low relaxation type and shall conform to ACI 423.6.2.1.

C. Anchorages and couples, sheathing, and post-tensioning coating are to comply with ACI 423.6.

2.3 DELIVERY, HANDLING AND STORAGE IS TO BE IN ACCORDANCE WITH ACI 423.6.1.7.

PART 3 – EXECUTION

3.1 GENERAL

The post-tensioning installer is to comply with the requirements of ACI 423.6.3.1 in the inspection of any installation of the post-tensioning products.

3.2 Tendons and anchorages are to be installed, inspected and repaired in conformance with ACI 423.6.3.2.

3.3 TENDON STRESSING

A. Tendons are to be tensioned using hydraulic jacks equipped with hydraulic pressure gauges calibrated as a unit so that the stresses in the tendon can be calculated at any time. The jacks are to have grips that will not notch the strand greater than the anchoring wedges. The stressing equipment is to conform to Chapter 4, Section 4.4.7.2 of the Post-Tensioning Manual – Sixth Edition.

B. All tendons must be tensioned so that the post-tension force is not less than that required by the plans or approved shop drawings. For low-relaxation strands the maximum temporary stress prior to seating the post-tensioning steel must not exceed 80% of minimum ultimate tensile strength.

C. TENDON FINISHING

After the stressing operation has been completed and the Design Engineer and Architect have approved the measured elongations, tendon tails must be cut off using an abrasive saw and either capped or encased in concrete to seal the anchorages against leakage. Cutting must be done within ¾ inch of the wedge.

END OF SECTION 033300

DIVISION 04

MASONRY

SECTION 040514 - MASONRY MORTARING AND GROUTING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes mortar and grout for masonry.

B. Related Sections:
   1. Section 042000 - Unit Masonry: Installation of mortar and grout.

1.2 REFERENCES

A. American Concrete Institute:
   1. ACI 530 - Building Code Requirements for Masonry Structures.
   2. ACI 530.1 - Specifications for Masonry Structures.

B. ASTM International:
   1. ASTM C5 - Standard Specification for Quicklime for Structural Purposes.
   2. ASTM C91 - Standard Specification for Masonry Cement.
   3. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
   4. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
   5. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
   6. ASTM C150 - Standard Specification for Portland Cement.
   7. ASTM C199 - Standard Test Method for Pier Test for Refractory Mortars.
   8. ASTM C206 - Standard Specification for Finishing Hydrated Lime.
   9. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
   10. ASTM C387/C387M - Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
   11. ASTM C404 - Standard Specification for Aggregates for Masonry Grout.
   12. ASTM C476 - Standard Specification for Grout for Masonry.
   13. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
   14. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
   15. ASTM C1019 - Standard Test Method for Sampling and Testing Grout.
   16. ASTM C1142 - Standard Specification for Extended Life Mortar for Unit Masonry.
   17. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms.
   18. ASTM C1329 - Standard Specification for Mortar Cement.
   19. ASTM C1357 - Standard Test Method for Evaluating Masonry Bond Strength.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal requirements.

B. Samples: Submit two samples of mortar, illustrating mortar color and color range.

C. Design Data: Submit design mix when Property specification of ASTM C270 is to be used, required environmental conditions, and admixture limitations.

D. Test Reports:
   1. Submit reports on mortar indicating conformance of mortar to property requirements of ASTM C270 and test and evaluation reports to ASTM C780 for aggregate ratio and water content, air content, consistency and compressive strength.
   2. Submit reports on grout indicating conformance of grout to property requirements of ASTM C476 and test and evaluation reports to ASTM C1019.

E. Manufacturer's Installation Instructions: Submit premix mortar manufacturer's installation instructions.

F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 530 and ACI 530.1.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Section 016000 - Product Requirements.

B. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.

C. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

PART 2 PRODUCTS

2.1 MORTAR AND MASONRY GROUT

A. Manufacturers:
   1. Blue Circle Cement
   2. Quikrete Companies
   3. CEMEX Mortar
   4. Substitutions: Section 016000 - Product Requirements.

2.2 COMPONENTS

A. Portland Cement: ASTM C150, Type I, gray color.

B. Blended Cement: ASTM C595; Type , gray color.

C. Premix Mortar: ASTM C387/C387M, Type S or N, using gray color cement with mineral oxide pigment color.

D. Mortar Aggregate: ASTM C144, standard masonry type.

E. Hydrated Lime: ASTM C206, Type N.

F. Quicklime: ASTM C5, non-hydraulic type.

G. Grout Aggregate: ASTM C404, fine.

H. Water: Clean and potable.

I. Mortar Color: Mineral oxide pigment; colors as selected, minimum three (3) colors.

J. Calcium chloride is not permitted.

2.3 MIXES

A. Mortar Mix:

1. Mortar For Structural Masonry: ASTM C270, Type S using Proportion specification.
2. Mortar For Non-Structural Masonry: ASTM C270, Type N using Proportion specification.
3. Mortar For Glass Unit Masonry: ASTM C270, Type S using Proportion specification.

B. Mortar Mixing:
1. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.
2. Achieve uniformly damp sand immediately before mixing process.
3. Re-temper only within two hours of mixing.

C. Grout Mixes:
1. Grout for Non-Structural Masonry: 2,000 psi strength at 28 days; 8-11 inches slump; mixed in accordance with ASTM C476 Fine grout.
2. Grout for Structural Masonry: 2,000 psi strength at 28 days; 8-11 inches slump; mixed in accordance with ASTM C476 Fine grout.
3. Application:
    a. Coarse Grout: For grouting spaces with minimum 4 inches dimension in every direction.
    b. Fine Grout: For grouting other spaces.

D. Grout Mixing:
1. Mix grout in accordance with ASTM C94/C94M, modified to use ingredients complying with ASTM C476.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Request inspection of spaces to be grouted.

3.2 INSTALLATION

A. Install mortar and grout in accordance with ACI 530.1 Specifications for Masonry Structures.

3.3 FIELD QUALITY CONTROL

A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Establishing Mortar Mix: In accordance with ASTM C270.

3.4 SCHEDULES

A. Brick: Type “N”, color as selected.

B. Burnished CMU: Type “N”, color as selected.

C. Cast Stone: Type “N”, color as selected.

END OF SECTION 040514

SECTION 042000 - UNIT MASONRY

PART 1 GENERAL

1.1 SUMMARY

A. Section includes pre-faced brick; burnished CMU reinforcement, anchorage, and accessories.

B. Related Sections:
   1. Section 04 05 14 - Masonry Mortaring and Grouting: Mortar and grout.
   2. Section 07 90 01 - Joint Protection: Rod and sealant at control and expansion joints.

1.2 REFERENCES

A. American Concrete Institute:
   1. ACI 530 - Building Code Requirements for Masonry Structures.
   2. ACI 530.1 - Specifications for Masonry Structures.

B. ASTM International:
   1. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
   2. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
   3. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
   4. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
   5. ASTM A580/A580M - Standard Specification for Stainless Steel Wire.
   6. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
   7. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   8. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement.
   9. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction.
   10. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
   11. ASTM C55 - Standard Specification for Concrete Brick.
   12. ASTM C62 - Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale).
   13. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
   14. ASTM C73 - Standard Specification for Calcium Silicate Face Brick (Sand-Lime Brick).
   15. ASTM C126 - Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.
   16. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units.
   17. ASTM C140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.

18. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale).
19. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
20. ASTM C652 - Standard Specification for Hollow Brick (Hollow Masonry Units Made From Clay or Shale).
21. ASTM C744 - Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units.
22. ASTM C1405 - Standard Specification for Glazed Brick (Single Fired, Brick Units).
23. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
24. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
25. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

C. Forest Stewardship Council:
   1. FSC Guidelines - Forest Stewardship Council Guidelines.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal requirements.

B. Product Data:
   1. Submit data for pre-faced brick & concrete masonry units, and fabricated wire reinforcement wall ties, anchors, and other accessories.
   2. Indicate initial rate of absorption for clay and shale brick.

C. Samples: Submit four samples of decorative block, face brick, units to illustrate color, texture and extremes of color range.

D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 530 Building Code Requirements for Masonry Structures and ACI 530.1 Specification for Masonry Structures.

B. Fire Rated Wall Construction: Rating as indicated on Drawings.
   1. Tested Rating: Determined in accordance with ASTM E119.
   2. Prescriptive Rating: determined in accordance with applicable code.

C. Surface Burning Characteristics:
   1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

D. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation insert.

1.5 QUALIFICATIONS

A. Installer: Company specializing in performing Work of this section with documented experience.

1.6 MOCKUP

A. Section 01 40 00 - Quality Requirements: Mockup requirements.

B. Construct pre-faced brick veneer masonry wall mockup, 8 feet long by 6 feet high, including masonry, mortar and accessories.

C. Construct mock-up of brick arch selected by Architect. Incorporate accepted mock-up as part of Work.

D. Locate where directed by Architect/Engineer.

1.7 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Accept pre-faced units on site. Inspect for damage.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.

C. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

1.10 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate masonry veneer work with installation of windows and door.

1.11 EXTRA MATERIALS

A. Section 01 70 00 - Execution and Closeout Requirements: Spare parts and maintenance products.

PART 2 PRODUCTS

2.1 COMPONENTS

A. Facing Brick: ASTM C216, Type FBS, Grade SW;
   1. Match brick at existing Parking Garage.

B. Brick Size and Shape: Nominal size of 3-5/8 x 2-1/4 x 7-5/8 inches. Furnish special units for 90 degree corners, lintels, and bull nosed corners.

C. Special Brick Shape: Shaped to profile indicated; surface texture on sides and ends. Provide special corner and end shapes.

D. Concrete Brick Units: ASTM C55, normal weight.

E. Burnished Concrete Masonry Units: ASTMC90.
   1. Manufacturers:
      a. Amcon
      b. Angelus Block Company
   2. Size: 8” x 8” x 16”
   3. Burnished Color: as selected from manufacturer’s medium weight colors.

2.2 ACCESSORIES

A. Single Wythe Joint Reinforcement: ASTM A951/A951M; ladder type; steel; 0.188 inch diameter side rods with 0.148 inch diameter cross ties; hot dip galvanized.

B. Multiple Wythe Joint Reinforcement: ASTM A951/A951M; ladder type; steel; with moisture drip; adjustable type; 0.188 inch diameter side rods with 0.148 inch diameter cross ties; hot dip galvanized.

C. Reinforcing Steel: specified in Section 03 20 00 uncoated finish.

D. Concealed arch adjustable lintel system: Hohmann and Barnard or Halfen. Galvanized finish.

E. Wall Ties: Dove tail anchor: Slot and corrugated anchor.

F. Anchor Rods: ASTM A307; Grade C; J-shaped or L-shaped; complete with washers and heavy hex nuts; sized for minimum 15 inch embedment; galvanized finish.
   1. Hot-Dipped Galvanizing: ASTM A153/A153M.
   2. Mechanical Galvanizing: ASTM B695; Class 55.

G. Mortar and Grout: As specified in Section 04 05 14.

H. Copper/Kraft Paper Flashings: 5 oz/sq ft rolled sheet copper bonded to fiber reinforced asphalt treated Kraft paper; manufactured by “Copper Top”.

I. Lap Sealant: Butyl type as specified in Section 07 90 00.

J. Preformed Control Expansion & Joints for Brick and CMU: Rubber material. Furnish with corner and tee accessories, cement fused joints.

K. Joint Filler: Closed cell rubber; oversized 50 percent to joint width; self expanding.

L. Building Paper: ASTM D226; Type II, No. 30 unperforated asphalt felt.

M. Nailing Strips: Specified in Section 06 10 53.

N. Weeps: Mortar Net: "Weep Vent".

O. Cavity Mortar net: "Mortar Net" drain material.

P. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

Q. Steel Lintels: size as indicated on Drawings, hot-dip galvanized.

R. Self-stick SBS Type Flashing: 40 mils thick, self adhesive rubberized asphalt bonded to 2 mils, high density polyethylene film.

2.3 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

B. Test brick efflorescence in accordance with ASTM C67. Brick rated greater than "slightly effloresced" is not acceptable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: coordination and project conditions.

B. Verify field conditions are acceptable and are ready to receive work.

C. Verify items provided by other sections of work are properly sized and located.

D. Verify built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION

A. Direct and coordinate placement of metal anchors supplied to other sections.

B. Furnish temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent support.

C. Wet clay and shale brick before laying when initial rate of absorption is greater than 30 grams when tested in accordance with ASTM C67.

3.3 INSTALLATION

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form bed and head joints of uniform thickness.

C. Coursing of Brick Units:
   1. Bond: Running.
   2. Coursing: Three units and three mortar joints to equal 8 inches.
   3. Mortar Joints: Concave.

D. Placing And Bonding:
   1. Lay solid masonry units in full bed of mortar, with full head joints.
   2. Lay hollow masonry units with face shell bedding on head and bed joints.
   3. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.
   4. Remove excess mortar as work progresses.
   5. Interlock intersections and external corners.
   6. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment is required, remove mortar and replace.
   7. Perform job site cutting of masonry units with proper tools to assure straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
   8. Cut mortar joints flush where wall tile is scheduled, resilient base is scheduled, or bitumen dampproofing is applied.
   9. Isolate masonry from vertical structural framing members with movement joint as indicated on Drawings.
   10. Isolate top of masonry from horizontal structural framing members and slabs or decks with compressible joint filler.

E. Weeps and Vents: Furnish weeps and vents in outer wythe at 24 inches oc horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.

F. Cavity Wall: Do not permit mortar to drop or accumulate into cavity air space or to plug weeps. Build inner wythe ahead of outer wythe to receive cavity insulation and air/vapor retarder adhesive.
   1. Install cavity drain material continuously at bottom of each cavity above through wall flashing, above shelf angles and lintels and at bottom of walls.

G. Joint Reinforcement And Anchorage - Masonry Veneer:
   1. Install horizontal joint reinforcement 16 inches oc. horizontally and vertically.
   2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
   3. Place joint reinforcement continuous in first and second joint below top of walls.
   4. Lap joint reinforcement ends minimum 6 inches.
   5. Embed wall ties in masonry backing to bond veneer at maximum 16 inches oc vertically and 16 inches oc horizontally. Place wall ties at maximum 8 inches oc vertically within 8 inches of jamb of wall openings.
   6. Secure wall ties to stud framed backing and embed into masonry veneer at maximum 16 inches oc vertically and 16 inches oc horizontally.
   7. Place wall ties at maximum 8 inches oc vertically within 8 inches of jamb of wall openings.

8. Place wall ties at maximum 8 inches on center horizontally within 8 inches of head and sill of wall openings.

H. Joint Reinforcement And Anchorages - Cavity Wall Masonry:
   1. Install horizontal joint reinforcement 16 inches oc.
   2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
   3. Place joint reinforcement continuous in first and second joint below top of walls.
   4. Lap joint reinforcement ends minimum 6 inches.

I. Masonry Flashings:
   1. Extend flashings horizontally through outer wythe at foundation walls, above ledge or shelf angles and lintels, under parapet caps, at bottom of walls, and turn down on outside face to form drip.
   2. Turn flashing up minimum 8 inches and seal to sheathing over steel stud framed backing with sealant and self-stick SBS flashing.
   3. Lap end joints minimum 6 inches and seal watertight.
   4. Turn flashing, fold, and seal at corners, bends, and interruptions.

J. Lintels:
   1. Install loose steel lintels over openings.
   2. Maintain minimum 8 inch bearing on each side of opening.

K. Control And Expansion Joints:
   1. Install control and expansion joints at the following maximum spacings, unless otherwise indicated on Drawings:
      a. Exterior Walls: 20 feet on center and within 24 inches on one side of each interior and exterior corner.
      b. At changes in wall height.
   2. Do not continue horizontal joint reinforcement through control and expansion joints.
   3. Install preformed control joint device in continuous lengths. Seal butt and corner joints.
   4. Size control joint in accordance with Section 07 90 00 for sealant performance.
   5. Form expansion joint by omitting mortar and cutting unit to form open space.

L. Built-In Work:
   1. As work progresses, install built-in metal door frames, window frames, wood nailing strips, anchor bolts, plates, and other items to be built-in the work and furnished by other sections.
   2. Install built-in items plumb and level.
   3. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout or mortar. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
   4. Do not build in materials subject to deterioration.

M. Cutting And Fitting:
   1. Cut and fit for chases, pipes, conduit, sleeves, and grounds. Coordinate with other sections of work to provide correct size, shape, and location.
   2. Obtain Architect/Engineer’s approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.4 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation From Alignment of Pilasters: 1/4 inch.

C. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

D. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

E. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

F. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

G. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.

H. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

I. Maximum Variation for Steel Reinforcement:
   1. Install reinforcement within the tolerances specified in ACI 530.1 for foundation walls.
   2. Plus or minus 1/2 inch when distance from centerline of steel to opposite face of masonry is 8 inches or less.
   3. Plus or minus 1 inch when distance is between 8 and 24 inches.
   4. Plus or minus 1-1/4 inch when distance is greater than 24 inches.
   5. Plus or minus 2 inches from location along face of wall.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements and 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Brick Units: Test each type in accordance with ASTM C67, 5 random units for each 50,000 units installed.

C. Concrete Masonry Units: Test each type in accordance with ASTM C140.

3.6 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.

B. Remove excess mortar and mortar smears as work progresses.

C. Replace defective mortar. Match adjacent work.

D. Clean soiled surfaces with cleaning solution.

E. Use non-metallic tools in cleaning operations.

3.7 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Protect exposed external corners subject to damage.

C. Protect base of walls from mud and mortar splatter.

D. Protect masonry and other items built into masonry walls from mortar droppings and staining caused by mortar.

E. Protect tops of masonry work with waterproof coverings secured in place without damaging masonry. Provide coverings where masonry is exposed to weather when work is not in progress.

3.8 SCHEDULES

A. Exterior Brick Veneer:
   1. Match brick on existing COB I.

B. Burnished CMU:
   1. Color as selected.

END OF SECTION 042000

SECTION 047200 - CAST STONE MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast stone wall caps.
2. Anchors and supports.
3. Accessories.

B. Related Requirements:

1. Section 040514 - Masonry Mortaring and Grouting: Mortar for setting cast stone units.
2. Section 055000 - Metal Fabrications: Shelf angles and supports.
3. Section 076200 - Sheet Metal Flashing and Trim: Product requirements for reglets for flashings for placement by this Section.
4. Section 079000 - Joint Protection: Rod and sealant at control and expansion joints.

1.2 REFERENCE STANDARDS

A. American Concrete Institute:

1. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures and Related Commentaries.

B. ASTM International:

1. ASTM A36 - Standard Specification for Carbon Structural Steel.
2. ASTM A36M - Standard Specification for Carbon Structural Steel.
3. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
4. ASTM A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
5. ASTM A185 - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
6. ASTM A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
7. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
8. ASTM A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
9. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
10. ASTM A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

11. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
12. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction.
13. ASTM C33 - Standard Specification for Concrete Aggregates.
14. ASTM C33M - Standard Specification for Concrete Aggregates.
15. ASTM C150 - Standard Specification for Portland Cement.
16. ASTM C150M - Standard Specification for Portland Cement.
17. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
18. ASTM C260M - Standard Specification for Air-Entraining Admixtures for Concrete.
19. ASTM C426 - Standard Test Method for Linear Drying Shrinkage of Concrete Masonry Units.
20. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
21. ASTM C494M - Standard Specification for Chemical Admixtures for Concrete.
22. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
23. ASTM C595M - Standard Specification for Blended Hydraulic Cements.
24. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
25. ASTM C666 - Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
26. ASTM C666M - Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
27. ASTM C979 - Standard Specification for Pigments for Integrally Colored Concrete.
28. ASTM C979M - Standard Specification for Pigments for Integrally Colored Concrete.
29. ASTM C989 - Standard Specification for Slag Cement for Use in Concrete and Mortars.
30. ASTM C989M - Standard Specification for Slag Cement for Use in Concrete and Mortars.
31. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete.
32. ASTM C1116M - Standard Specification for Fiber-Reinforced Concrete.
33. ASTM C1157 - Standard Performance Specification for Hydraulic Cement.
34. ASTM C1157M - Standard Performance Specification for Hydraulic Cement.
35. ASTM C1194 - Standard Test Method for Compressive Strength of Architectural Cast Stone.
36. ASTM C1195 - Standard Test Method for Absorption of Architectural Cast Stone.
37. ASTM C1364 - Standard Specification for Architectural Cast Stone.
38. ASTM D1729 - Standard Practice for Visual Appraisal of Colors and Color Differences of Diffusely-Illuminated Opaque Materials.
39. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.

C. Cast Stone Institute:

1. Technical Manual.

1.3 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with metal-framed backup.

1.4 PREINSTALLATION MEETINGS

A. Section 013000 - Administrative Requirements: Requirements for preinstallation meeting.

B. Convene minimum one week prior to commencing Work of this Section.

1.5 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data for cast stone units, wall ties , anchors and other accessories.

C. Shop Drawings:

1. Indicate cast stone layout, profiles, cross sections, reinforcement, exposed faces, joint arrangement, anchoring methods, and anchors.
2. Indicate cast stone types and locations.

D. Samples:

1. Submit two of each cast stone item, 12 by 12 inches in size, illustrating profiles, finish, texture, and color range.
2. Submit two of each anchor, illustrating material, configuration, and finish.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Test and Evaluation Reports: Indicate concrete mix design compressive strength and water absorption.

G. Manufacturer's Instructions: Submit instructions for anchor attachment, cast stone cleaning, and special Project installation conditions.

H. Source Quality-Control Submittals: Indicate results of factory tests and inspections.

I. Qualifications Statements:

1. Submit qualifications for manufacturer and installer.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.

B. Extra Stock Materials:

1. Furnish two of each type of cast stone wall cap.

1.7 QUALITY ASSURANCE

A. Perform Work according to ACI 530/530.1 and according to Cast Stone Institute Technical Manual.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 3 years experience.

1. Manufacturing plant certified by the Cast Stone Institute**.**

B. Installer: Company specializing in performing Work of this Section with minimum three years' experience and approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Mark cast stone units with same identification marks as shown on Shop Drawings.

C. Inspection: Accept cast stone on Project Site in manufacturer's protective packaging, and inspect for damage.

D. Store materials according to manufacturer's instructions.

E. Store cast stone on Project Site covered and elevated above grade.

F. Protect cast stone from damage, soiling, and staining.

G. Provide ventilation to prevent condensation from forming on cast stone.

1.10 AMBIENT CONDITIONS

A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.

B. Cold Weather Requirements: According to ACI 530/530.1, when ambient temperature or temperature of masonry units is less than 40 degrees F.

C. Hot Weather Requirements: According to ACI 530/530.1, when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

1.11 EXISTING CONDITIONS

A. Field Measurements:

1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 CAST STONE

A. Manufacturers:

1. Rockcast: Architectural cast stone masonry veneer.
2. Architectural Cast Stone.
3. Substitutions: Specified in Section 016000 – Product Requirements.

B. Description:

1. Comply with ASTM C1364.
2. Architectural Cast Stone Units Fabrication Method: **Dry casting**.
3. Finish: Fine-grained texture simulating natural cut stone.

2.2 PERFORMANCE AND DESIGN CRITERIA

A. Color and Finish: Fine grain texture and color as selected.

2.3 MATERIALS

A. Portland Cement:

1. Comply with ASTM C150, Type I - Normal.

B. Blended and Hydraulic Cement: Comply with ASTM C595 and ASTM C1157.

C. Coarse Aggregates:

1. Comply with ASTM C33, except grading requirements.
2. Granite, quartz, or limestone.

D. Fine Aggregates:

1. Comply with ASTM C33, except grading requirements.
2. Manufactured or natural sand.

E. Coloring Pigments:

1. Comply with ASTM C979.
2. Inorganic iron oxide.

F. Chemical Admixtures:

1. Air Entraining: Comply with ASTM C260.
2. Water Reducing, Retarding, and Accelerating: Comply with ASTM C494.

G. Fly Ash: Comply with ASTM C618.

H. Blast Furnace Slag: Comply with ASTM C989.

I. Water: Potable.

J. Welded Wire Fabric: ASTM A185.

2.4 FABRICATION

A. Thickness: nominal 4 inches inches.

B. Size:

1. As indicated on Drawings.
2. Edges: Square.

C. Use rigid molds, constructed to maintain cast stone units uniform in shape, size, and finish.

D. Forming:

1. Form units to length required for joint layout as indicated on Drawings .
2. Field cutting to length is not permitted.

E. Reinforce units according to ASTM C1364 for safe handling, and as indicated on Shop Drawings, to resist structural loads.

1. Use galvanized-finished reinforcing, if concrete cover over reinforcing is less than 1-1/2 inches thick, including end conditions.

F. Embed anchors and other cast-in items.

G. Form external corners to square joint profile.

H. Slope exposed top surfaces of horizontal sill surfaces for natural wash.

I. Drip Slots:

1. Form drip slots in bottom surface of exterior units projecting more than 1/2 inch beyond window frame.
2. Size slots not less than 3/8 inch wide and 1/4 inch deep; full width of projection.

J. Curing: Cure units to develop concrete quality and to minimize appearance blemishes, including nonuniformity, staining, and surface cracking.

K. Acid-etch exposed-to-view surfaces to remove cement film and to achieve uniform appearance.

2.5 MIXES

A. Concrete:

1. Compressive Strength:

a. Comply with ASTM C1194.
b. Minimum 6,500 psi at 28 days.

2. Slump: As determined by manufacturer.
3. Absorption:

a. Comply with ASTM C1195.
b. Maximum 6 percent for cold water and 10 percent for boiling water, at 28 days.

2.6 ACCESSORIES

A. Anchors and Supports:

1. Material: ASTM A666 Grade, Type 304 stainless steel.
2. Sizes and Configurations: As required for vertical and horizontal support of cast stone and resisting specified loads.

B. Mortar: As specified in Section 040513 - Masonry Mortaring.

C. Flashings: As specified in Section 076200 - Sheet Metal Flashing and Trim.

D. Self-Adhering Flashing: Grace or Nervastral.

E. Sealant:

1. Type: , as specified in Section 079000 - Joint Protection.
2. Color: as selected.

F. Weeps: as specified in 04 20 00 Unit Masonry.

G. Cleaning Solution: Nonacidic detergent type and not harmful to cast stone or adjacent materials and approved by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify that field conditions are acceptable and are ready to receive Work.

C. Verify that items provided by other Sections of Work are properly sized and located.

D. Verify elevations, dimensions, and alignment of foundations and other supporting construction prior to beginning Work.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Coordinate installation of anchors furnished to other Sections.

C. Provide for erection procedures and induced loads during erection.

D. Furnish temporary bracing during installation, and maintain temporary bracing in place until final support is provided.

3.3 INSTALLATION

A. Establish indicated lines, levels, and coursing, and protect from displacement.

B. Maintain cast stone courses to uniform dimension.

C. Form bed and head joints of uniform thickness.

D. Cast Stone Coursing:

1. Joint Location: As indicated on Drawings.
2. Joint Width: 3/8 inches.
3. Joint Shape: Concave.

E. Placing and Bonding:

1. Install anchors to support and position cast stone.
2. Drench cast stone units with clear running water, just prior to setting.
3. Lay cast stone units in full bed of mortar, with full head joints.
4. Leave head and top joints in units with exposed top surfaces open to receive sealant.
5. Leave joints under shelf angles open to receive sealant.
6. Fill dowel holes and anchor slots with mortar.
7. Adjustments:

    a. Do not shift or tap cast stone units after mortar has achieved initial set.
    b. If adjustment is required, remove mortar and replace.

8. Mortar Joints:

    a. Rake mortar joints 3/4 inches deep for pointing, and sponge face of each stone to remove excess mortar.
    b. Tuck-point mortar joints.
    c. Pack mortar tightly into joint.
    d. Tool joint surface to specified shape.

9. Site cutting of cast stone units is not permitted.

F. Cavity Wall:

1. Do not permit mortar to drop or accumulate into cavity air space or to plug weeps.
2. Build backup masonry wythe ahead of cast stone veneer to receive cavity insulation and air/vapor-retarder adhesive.

G. Flashings:

1. Extend flashings horizontally through cast stone veneer at foundation walls, above ledge or shelf angles and lintels, under parapet caps, and at bottom of walls and turn down on outside face to form drip.
2. Turn flashing up minimum 8 inches and seal to sheathing over steel stud backing.
3. Lap end joints minimum 6 inches and seal watertight.
4. Turn flashing, fold, and seal at corners, bends, and interruptions.

H. Control Joints:

1. Form control joint by omitting mortar at sealing joint, as specified in Section 079000 - Joint Protection.

I. Built-In Work:

1. As Work progresses, install built-in metal door frames and window frames, and other items to be built into Work and furnished by other Sections.
2. Install built-in items plumb and level.

3.4 TOLERANCES

A. Section 014000 - Quality Requirements: Requirements for tolerances.

B. Tolerances: According to Cast Stone Institute Technical Manual.

3.5 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

B. Remove excess mortar and sealant as Work progresses.

C. Replace defective mortar.

D. Match adjacent Work.

E. Wet cast stone, and clean soiled surfaces with cleaning solution.

F. Use nonmetallic tools in cleaning operations.

3.6 PROTECTION

A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Protect cast stone from contact with mortar, soil, and other materials capable of staining or discoloring cast stone.

C. Coverings:

1. Protect tops of masonry Work with waterproof coverings secured in place without damaging masonry.
2. Provide coverings where masonry is exposed to weather when Work is not in progress.
3. Maintain protection on tops of completed exterior walls until installation of permanent waterproof cap materials.

END OF SECTION 047200

DIVISION 05

METALS

SECTION 051200 – STRUCTURAL STEEL FRAMING (no beam shoring)

PART 1 – GENERAL

1.1 DESCRIPTION

A. All work under this Section shall be performed entirely under one sub-contract, the scope of which shall include the production of shop drawings, the fabrication of all steel members and the erection of all structural and miscellaneous steel members.

B. Work is to include all structural steel framing members, support members, with required bracing welds, fasteners, base plates, bearing plates, anchor bolts, and miscellaneous structural steel items.

1.2 APPLICABLE STANDARDS

A. American Institute of Steel Construction
1. AISC Manual of Steel Construction

B. American Society for Testing and Materials:
1. ASTM A 36 for steel plates
2. ASTM A992 Grade 50 for Hot-Rolled Shapes
3. ASTM A233 Class E70XX series electrodes for manual arc welding and Grade SAW-1 submerged arc processed shall be used
4. ASTM F1554 (Grade 36) for column anchor bolts
5. ASTM A325 for high strength bolts
6. ASTM C827 for non-shrink and non-metallic grout
7. ASTM C191 for non-shrink and non-metallic grout
8. ASTM A500, Grade B structural tubing
9. ASTM A501 steel pipe

C. American Welding Society
1. AWSD1.1 Steel stud shear connectors

D. The Society for Protective Coatings
1. Specifications SSPC Paint 25

1.3 QUALITY ASSURANCE

A. A recognized testing laboratory approved by the Architect and Structural Engineer is to do the specified inspection and furnish to the Architect and Structural Engineer, reports of all inspections with complete summary of results. The Contractor shall coordinate all work required of the testing laboratory. Also see Section 014000 – QUALITY REQUIREMENTS.

B. The testing laboratory shall visually inspect all field welds and all bolted connections for compliance with the details shown on the Plans and the requirements of the AISC.

C. The testing laboratory shall use Ultrasonic Testing on 10% of all field welds.

D. The Owner reserves the right to employ an independent testing laboratory to gamma ray or magna-flux all welds. Any welds found to be inadequate shall be removed and replaced by the Contractor at no additional cost to the Owner.

E. Welds shall be made according to requirements of the American Welding Society. Welders shall be certified for this project as qualified structural welders according to the requirements of the American Welding Society by and independent testing laboratory approved by the Architect. Copies of current certificates for each field welder shall be furnished to the Architect.

F. Mill certificates for all structural steel are to be available to the Architect for his review.

1.4 SUBMITTALS

A. The fabricator shall furnish shop drawings as required by the contract documents showing all details necessary for erection and fabrication of his work to the Architect for his approval. Reproductions of the contract structural drawings for erection plans and details will not be permitted without the approval of the Engineer. Detailing shall be performed by experienced detailers. Erection plans, erection details, and detailing shall be clear and easily readable. If it is apparent to the Architect or Structural Engineer that the Contractor has not thoroughly checked the shop drawings prior to submittal, the Contractor will be notified to resubmit a set that has been properly checked, and the previous submittal will be abandoned. Only complete sets of shop drawings will be reviewed unless an agreement to check partial submittals is obtained prior to the first submittal. Do not fabricate any material until approval of the Architect has been obtained.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Structural steel shall be new sections that conform to the current Specifications of ASTM A-992, Grade 50.

B. High strength bolts shall conform to ASTM Specification A325-N.

C. Welds shall be E70XX Series electrodes for manual arc welding and grade SAW-1 for submerged arc process.

D. All column anchor bolts shall be ASTM A325 (Group A).

E. All bolts not indicated otherwise on plans are ¾". All connections not noted otherwise on plans shall be framed connections.

F. Shear connectors shall be ¾" diameter x 4" headed studs conforming to the requirements of AWSD1.1.

G. Grout for base plates shall be precision, pre-mixed, non-shrink and non-metallic in conformance with ASTM C827. Grout shall be easily workable as well as being made flowable with an initial setting time of not less than 45 minutes and shall meet the requirements of ASTM C191. Grout shall have a 14 day compressive strength of 6000 psi when mixed to its flowable state.

H. All structural steel shall be shop painted, surfaces to be painted shall be prepared per the Society for Protective coatings SSPC-SP3 or better.

Paint shall be per SSPC Paint 25, Tnemec Primers Series 10 – 99 or approved equal.

Field painting of work under this heading is specified in Section 09900, Paints and Coatings.

Where sprayed on fire-proofing is specified steel shall not be primed unless required by the fire-proofing manufacturer. If primer is required for fire-proofed steel, it shall be suitable to the fireproofing manufacturer for proper adhesion.

I. Galvanizing:

Provide a zinc coating for those items shown or specified to be galvanized as follows:
1. ASTM A 153 for galvanizing iron and steel hardware.
2. ASTM A 123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 1/8" thick and heavier.
3. ASTM A 386 for galvanizing assembled steel products.
4. ASTM A 446, Grade 90 for sheet steel.

PART 3 – EXECUTION

3.1 FABRICATION

A. All workmanship shall be equal to the best practice in modern structural shops. As a minimum required all structural steel work shall conform to the specifications of "American Institute of Steel Construction" (AISC).

B. The fabricator shall design all simple wide flange beam connections to resist one half of the MAXIMUM TOTAL UNIFORM LOAD as provided in Table 3-6 of the AISC Steel Construction Manual.

C. Shop connections shall be welded. Field connections shall be bolted unless welded connections are indicated on plans. Welded connections shall be detailed consistent with requirements of the American Welding Society. Bolted connections shall be proportioned as shown in AISC Manual, using minimum 3/4" A325 high strength bolts unless shown otherwise on plans.

D. Shop and field welders shall have been recently certified as qualified structural welder according to requirements of the American Welding Society.

E. Any splices not shown on the drawings shall be indicated clearly on the shop drawings and shall be made only with the approval of the Architect and/or Engineer.

F. The general contractor is to verify the sizes and locations of all required floor and roof openings, equipment supports, etc. with the various subcontractors. Any conditions which require revisions or additions to the structural framing are to be brought to the attention of the Architect and Structural Engineer prior to any construction. Any cost for the required structural changes will be borne by the General Contractor.

G. If a member size has been inadvertently omitted from the Plans, the fabricator shall contact the Structural Engineer for the required size prior to submittal of his bid proposal.

H. Erection marks shall be painted on all structural members.

I. Provide all necessary erection clips, angles, seats, etc., to properly erect structural steel.

J. Welding shall be in accordance with the requirements of the American Welding Society with all possible welding performed in the shop.

K. Provide one shop coat of paint to all structural members, connectors, angles, etc. Thickness shall be at least 1 mil dry film. All steel shall have been power wire brushed so as to remove all loose mill scale, rust, weld slag, etc., prior to painting.

L. Fabricator shall obtain written approval from the manufacturer or applicator or any specified sprayed-on-fire-proofing material that the paint to be used for the shop coat is suitable for the adhesion of the sprayed-on material and a copy of same shall be submitted to the Architect.

M. The Contractor shall make measurements in the field to verify or supplement dimensions shown on the drawings, and he shall be responsible for proper measurements and fit of all items.

N. Over masonry openings for windows, doors, ducts, grilles, louvers, recesses in masonry walls, and where indicated or required, provide structural steel angles, channels, and shapes to properly support adjacent work. Where loose lintel angles occur in pairs, they shall have bolts and separators.

O. For those galvanized items, apply a high zinc dust content paint for re-galvanizing welds in galvanized steel, complying to the Military Specification MIL-P-21035 (Ships).

3.2 ERECTION

A. Provide false work, temporary bracing, and all tools, machinery and appliances, necessary for the expeditious handling of the work. False work and temporary bracing shall be properly designed and substantially constructed and maintained for the loads which will come upon it and shall remain in place until all permanent bracing is in place.

B. Bolts shall be installed using a plain hardened steel washer fabricated in accordance with ASTM F436-11 under the turned element and shall be tightened as per the requirements of the AISC.

C. The structural system and the individual structural members are designed to be self supporting only after all structural members are connected in place.

D. Steel furnished shall be true and free of twists, bends, and open joints between components parts. Material shall be thoroughly straightened in the shop before being laid out or worked in any way.

E. Each piece or member shall be properly identified by a mark and direction of setting. Contractor shall check each piece of conformity to plans and dimensions to maintain proper location, alignment and level.

F. All members shall be set plumb and true to exact level, or slope if required, and checked by instrument. Grout base plates solidly with approved non-shrinking grout. Set bearing plates in mortar consisting of Portland Cement and sand.

G. After erection, nuts, bolt heads, and burs or abraded spot shall be spot painted with above mentioned paint.

H. Shear connectors are to be equally spaced, are to be welded through the deck to all interior beams, and may be welded directly to exterior beams.

END OF SECTION 051200

SECTION 053123 – STEEL ROOF DECK

PART 1 – GENERAL

1.1 DESCRIPTION

A. Roof deck is to be galvanized steel Type “B” deck.

1.2 REFERENCES

A. AISI – Specification for the Design of Cold-Formed Steel Structural Members.

B. ASTM A36 – Structural Steel.

C. ASTM A525 – Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process G60 Coating Class.

D. ASTM A446 – Steel, Cold-Rolled Sheet, Carbon, Structural.

E. AWS D1.1 – Structural Welding Code

F. SDI – Design Manual for Composite Decks, Form Decks, Roof Decks.

1.3 SUBMITTALS

A. The fabricator shall furnish and submit before any fabrication, five (5) copies of shop drawings (erection and fabrication) of his work for the approval of the Architect. One (1) copy of each sheet will be returned marked for corrections or as approved. Copies of approved drawings shall be furnished the job as needed, and one (1) complete set given the Architect.

1.4 PRODUCT HANDLING

A. Steel deck shall be stored off the ground with one (1) end elevated to provide drainage and shall be protected from the elements with a waterproof covering, ventilated to avoid condensation.

B. Exercise care to control traffic and storage of materials on deck. Erected deck shall be planked or otherwise protected against damage from workers walking on material, heavy construction traffic and storage.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Steel deck shall be 1 ½" deep, 22 gage, Type B galvanized metal deck having the following minimal sectional properties:

l_p: 0.155 in^4/ft.
l_n: 0.183 in^4/ft.
S_p: 0.186 in^3/ft.
S_n: 0.192 in^3/ft.

Steel deck shall be manufactured from steel conforming to ASTM Designation A1008-00, Grades C, D, or E or A653/A653M-00, Grade SQ33 or higher, or equal, having a minimum yield strength of 33,000 pounds per square inch. The maximum working stress shall not exceed 20,000 pounds per square inch. The unit design stress shall in no case exceed the minimum yield strength of the steel divided by 1.65 for specific design uniform loads. The thickness of 22 gage steel before coating shall be 0.0295" for design thickness
and 0.028" for minimum thickness.

B. All accessory items necessary for a complete installation, whether specifically indicated in the specifications and/or drawings shall be furnished by the roof deck manufacturer.

C. The delivered thickness of the uncoated steel shall not be less than 95% of the design thickness.

D. Where possible sheets shall rest on four (4) supports (three span condition).

PART 3 – EXECUTION

3.1 INSTALLATION

A. Attachments:

1. Steel deck units shall be anchored to supporting members, including bearing walls, to provide lateral stability to the top flange of the supporting structural members.
2. Steel decks shall be attached to supporting structural members using a 36/7 pattern with No. 12 – 14 HWH TEK 1 screws when the maximum base metal thickness (support and deck) is less than or equal to 0.210". Where the base metal thickness falls within a range of 0.211" and 0.500", the deck shall be attached to supporting members using a No. 12 – 24 HWH TEK 5 screws. Screws shall have the following minimum allowable capacities: shear capacity of 176 lbs, pullover 295 lbs, and pullout capacity 74 lbs. Powder-actuated deck fasteners are acceptable as a substitute for TEK screws provided the allowable capacities are achieved.
3. Unless noted otherwise on Structural drawings, sides laps are not required. However, side laps are required for spans greater than 5 feet, side laps shall be fastened together using a No. 10-16 HWH TEK 3 at a maximum spacing of 3 feet center-to-center between supports.

B. All steel to be used for roof deck shall be free of oil, grease, and dirt, and shall be galvanized.

C. Deck sheets will be placed in accordance with approved erection layout drawing supplied by the deck manufacturer and in conformance with the deck manufacturer's standards. Roofs having a slope of ¼" or more in 12 inches shall be erected beginning at the low side to ensure

that end laps are shingle fashion. End laps of sheets shall be a minimum of 2 inches and shall occur over supports. Openings not shown on the erection diagrams, such as those required for stacks, conduits, plumbing, vents, etc., shall be cut (and reinforced, if necessary) by the trades requiring the openings.

D. Under no conditions will placed sheets be left unattached at the end of a working day.

END OF SECTION 053123

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Shop-fabricated metal items.
2. Elevator sill angles, hoist beams, and divider beams.
3. Ladders.
4. Structural supports for miscellaneous attachments.
5. Bollards.
6. Stair handrails and guardrails.
7. Expansion joint.

B. Related Requirements:

1. Section 033000 - Cast-In-Place Concrete: Execution requirements for embedded anchors and attachments for metal fabrications specified by this Section in concrete.

1.2 REFERENCE STANDARDS

A. Aluminum Association:

1. AA DAF-45 - Designation System for Aluminum Finishes.

B. American Architectural Manufacturers Association:

1. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
2. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
3. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
4. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

C. American National Standards Institute:

1. ANSI A14.3 - American National Standard (ASC) for Ladders - Fixed - Safety Requirements.

D. American Welding Society:

1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
2. AWS D1.1 - Structural Welding Code - Steel.
3. AWS D1.1M - Structural Welding Code - Steel.
4. AWS D1.6 - Structural Welding Code - Stainless Steel.

5. AWS D1.6M - Structural Welding Code - Stainless Steel.

E. ASTM International:

1. ASTM A36 - Standard Specification for Carbon Structural Steel.
2. ASTM A36M - Standard Specification for Carbon Structural Steel.
3. ASTM A53- Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
4. ASTM A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
5. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
6. ASTM A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
7. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
8. ASTM A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
9. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
10. ASTM A193M - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
11. ASTM A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
12. ASTM A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
13. ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
14. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes.
15. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
16. ASTM A312 - Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
17. ASTM A312M - Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
18. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
19. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated, 830 mPa Minimum Tensile Strength.
20. ASTM A354 - Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners.
21. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
22. ASTM A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
23. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
24. ASTM A554 - Standard Specification for Welded Stainless Steel Mechanical Tubing.
25. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
26. ASTM A563M - Standard Specification for Carbon and Alloy Steel Nuts.

27. ASTM A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
28. ASTM A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
29. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
30. ASTM A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
31. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
32. ASTM A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
33. ASTM A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
34. ASTM A992 - Standard Specification for Structural Steel Shapes.
35. ASTM A992M - Standard Specification for Structural Steel Shapes.
36. ASTM B26 - Standard Specification for Aluminum-Alloy Sand Castings.
37. ASTM B26M - Standard Specification for Aluminum-Alloy Sand Castings.
38. ASTM B85 - Standard Specification for Aluminum-Alloy Die Castings.
39. ASTM B85M - Standard Specification for Aluminum-Alloy Die Castings.
40. ASTM B177 - Standard Guide for Engineering Chromium Electroplating.
41. ASTM B177M - Standard Guide for Engineering Chromium Electroplating.
42. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
43. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
44. ASTM B210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.
45. ASTM B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.
46. ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire.
47. ASTM B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold-Finished Bar, Rod, and Wire.
48. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
49. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
50. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
51. ASTM F436 - Standard Specification for Hardened Steel Washers.
52. ASTM F436M - Standard Specification for Hardened Steel Washers.
53. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105 ksi Yield Strength.

F. Builders Hardware Manufacturers Association (BHMA):

1. ANSI/BHMA A156.20 - American National Standard for Strap and Tee Hinges and Hasps.

G. California Department of Health Services:

1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.

H. Green Seal:

1. GC-03- 2nd Edition, January 7, 1997 - Anti-Corrosive Paints.

I. National Ornamental & Miscellaneous Metals Association:

1. NOMMA Guideline 1 - Joint Finishes.

J. SSPC: The Society for Protective Coatings:

1. SSPC - Steel Structures Painting Manual.
2. SSPC Paint 15 - Steel Joist Shop Primer/Metal Building Primer.
3. SSPC Paint 20 - Zinc-Rich Coating (Type I - Inorganic and Type II - Organic).
4. SSPC SP 1 - Solvent Cleaning.
5. SSPC SP 10 - Near-White Blast Cleaning.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

C. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

D. Delegated Design Submittals: Submit signed and sealed Shop Drawings with design calculations.

E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

F. Qualifications Statement:

1. Submit qualifications for licensed professional.

1.4 QUALITY ASSURANCE

A. Finish joints according to NOMMA Guideline 1.

1.5 QUALIFICATIONS

A. Licensed Professional: Professional engineer experienced in design of specified Work and licensed in State of Louisiana.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept metal fabrications on-Site in labeled shipments. Inspect for damage.

C. Protect metal fabrications from damage by exposure to weather or by ground contact.

1.7 EXISTING CONDITIONS

A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 ELEVATOR SILL ANGLES, HOIST BEAMS, AND DIVIDER BEAMS

A. Sill Angles:

1. Steel sections as indicated on Drawings for support of elevator sills.
2. Finish: Galvanized.

B. Hoist and Divider Beams:

1. Steel, wide-flange sections.
2. Shape and Size: As required to support applied loads with maximum deflection of 1/240 of the span.
3. Finish: Prime paint, one coat.

2.2 LADDERS

A. Ladder:

1. ANSI A14.3.
2. Steel-welded construction.
3. Siderails:

    a. Size: 3/8 by 3 inches.
    b. Spacing: 20 inches o.c.

4. Rungs:

    a. Solid Tubular rod.
    b. Size: 1-inch diameter.
    c. Spacing: 12 inches o.c.

5. Mounting:

a. Space rungs 7 inches from wall surface.
b. Provide steel mounting brackets and attachments.

6. Finish: Galvanized Finish paint.

2.3 STRUCTURAL SUPPORTS

A. Other Structural Supports:

1. Description: Steel sections, shape and size as indicated on Drawings.
2. Finish: Prime paint, one coat.

2.4 PIPE BOLLARD

A. Pipe Bollards:
1. Fixed Bollard: 4" diameter, dome top, 4' high embedded in ground, galvanized painted steel pipe bollards.
2. Removable Bollards: 4" x 36" removable bollard, powder coated yellow. Lockable with embedment sleeve.
   a. Post Guard
   b. ULine
3. Substitutions: Substitutions under provisions of Section 01 60 00 – Product Requirements.

B. Concrete Fill: 3,000 psi as specified in Section 03 30 00 - Cast-in-Place Concrete.

C. Anchors: Concealed type as indicated on Drawings.

2.5 STAIR HANDRAILS AND GUARDRAILS

A. Powder-coated aluminum.

B. Size: As shown on drawings.

C. Color: As selected from standard colors.

2.6 EXPANSION JOINT

A. ¼" stainless steel diamond plate.

2.7 MATERIALS

A. Steel:

1. Structural W Shapes: ASTM A992.
2. Structural Shapes: ASTM A36.
3. Channels and Angles: ASTM A36.

4. Steel Plate: ASTM A36 ASTM A572; Grade 50.
5. Hollow Structural Sections: ASTM A500, Grade B.
6. Steel Pipe:

    a. ASTM A53, Grade B, Schedule 40.

7. Sheet Steel: ASTM A653, Grade 33 Structural Quality.
8. Bolts: ASTM A307; Grade A or B.
9. Nuts: ASTM A563; heavy-hex type.
10. Washers: ASTM F436; Type 1.
11. Welding Materials: AWS D1.1; type required for materials being welded.

B. Bolts, Nuts, and Washers for Equipment and Piping:

1. Carbon Steel:

    a. Structural Connections: ASTM A307, Grade A, hot-dip galvanized.
    b. Anchor Bolts: ASTM A307, Grade A ASTM A36, hot-dip galvanized.
    c. Pipe and Equipment Flange Bolts: ASTM A193, Grade B-7.

2. Stainless Steel: Type 316 stainless steel, Class 2; ASTM A193 for bolts; ASTM A194 for nuts.

2.8 FABRICATION

A. Fit and shop-assemble items in largest practical sections for delivery to Site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small, uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

G. Fabrication Tolerances:

1. Squareness: 1/8-inch maximum difference in diagonal measurements.
2. Maximum Offset between Faces: 1/16 inch.
3. Maximum Misalignment of Adjacent Members: 1/16 inch.
4. Maximum Bow: 1/8 inch in 48 inches.
5. Maximum Deviation from Plane: 1/16 inch in 48 inches.

2.9 FINISHES

A. Steel:
   1. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
   2. Do not prime surfaces in direct contact with concrete or where field welding is required.
   3. Prime-paint items with one coat except where galvanizing is specified.
   4. Galvanizing: ASTM A123; hot-dip galvanize after fabrication.
   5. Galvanizing for Fasteners, Connectors, and Anchors:

      a. Hot-Dip Galvanizing: ASTM A153.
      b. Mechanical Galvanizing: ASTM B695; Class 50 minimum.
   6. Sheet Steel: Galvanized with G90 coating class.
   7. Bolts: Hot-dip galvanized.
   8. Nuts: Hot-dip galvanized.
   9. Washers: Hot-dip galvanized.
   10. Shop Primer: SSPC Paint 15, Type 1, red oxide.
   11. Touchup Primer: Match shop primer.
   12. Touchup Primer for Galvanized Surfaces:

      a. SSPC Paint 20, Type I - Inorganic.
      b. ASTM A780.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Requirements for installation examination.

B. Verify that field conditions are acceptable and are ready to receive Work.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Clean and strip primed steel items to bare metal where Site welding is required.

C. Supply steel items required to be cast into concrete with setting templates to appropriate sections.

3.3 INSTALLATION

A. Install items plumb and level, accurately fitted, and free from distortion or defects.

B. Make provisions for erection stresses. Install temporary bracing to maintain alignment until permanent bracing and attachments are installed.

C. Field-weld components indicated on Shop Drawings.

D. Perform field welding according to AWS D1.1.

E. Obtain approval of Architect/Engineer prior to Site cutting or making adjustments not scheduled.

3.4 TOLERANCES

A. Section 014000 - Quality Requirements: Requirements for tolerances.

B. Maximum Variation from Plumb: 1/4 inch per story or for every 12 feet in height, whichever is greater, non-cumulative.

C. Maximum Variation from Level: 1/16 inch in 3 feet and 1/4 inch in 10 feet.

D. Maximum Offset from Alignment: 1/4 inch.

E. Maximum Out-of-Position: 1/4 inch.

3.5 FIELD QUALITY CONTROL

A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.

B. Welding: Inspect welds according to AWS D1.1.

C. Replace damaged or improperly functioning hardware.

D. After erection, touch up welds, abrasions, and damaged finishes with prime paint or galvanizing repair paint to match shop finishes.

E. Touch up factory-applied finishes according to manufacturer-recommended procedures.

3.6 ADJUSTING

A. Section 017000 - Execution and Closeout Requirements: Requirements for starting and adjusting.

B. Adjust operating hardware and lubricate as necessary for smooth operation.

END OF SECTION 055000

DIVISION 06

WOOD, PLASTIC, AND COMPOSITES

DIVISION 07

THERMAL AND MOISTURE PROTECTION

SECTION 071700 - BENTONITE WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Bentonite clay waterproofing in panel form.
2. Drainage panels and protective cover.

B. Related Requirements:

1. Section 03 30 00 – Cast-in-Place Concrete.

1.2 REFERENCE STANDARDS

A. National Roofing Contractors Association:

1. NRCA - The NRCA Waterproofing Manual.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.

C. Shop Drawings: Indicate details and locations of required flashings, joints, sealing at openings projections penetrations reglets and waterproofing of holes.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer's Instructions: Submit special preparation of substrate, panel attachment methods, and perimeter conditions requiring attention.

F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

G. Qualifications Statements:

1. Submit qualifications for manufacturer and installer.
2. Submit manufacturer's approval of installer.

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

B. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience and approved by manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Deliver materials in manufacturer's packaging, including application instructions.

C. Maintain bentonite products dry.

D. Protection: Protect with waterproof cover. Store on blocking to prevent ground moisture contact.

E. Maintain minimum ambient storage temperatures of 40 degrees F for bentonite gel products.

1.6 AMBIENT CONDITIONS

A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.

B. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application.

1.7 EXISTING CONDITIONS

A. Field Measurements: Verify field measurements of surfaces scheduled for waterproofing prior to installation.

1.8 WARRANTY

A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.

B. Furnish five-year installer's warranty for waterproofing failing to resist penetration of water.

C. Furnish five-year manufacturer's warranty for waterproofing failing to resist penetration of water.

D. For warranty repair work, remove and replace materials concealing waterproofing.

PART 2 - PRODUCTS

2.1 BENTONITE WATERPROOFING

A. Manufacturer List:

1. Carlisle: Model CCW Miraclay EF and Mirastop.
2. Cetco: Volcay Panels
3. Substitutions: Section 016000 - Product Requirements.

2.2 MATERIALS

A. Bentonite: Granulated, pure, dry, self-expanding bentonite clay comprised of 90 percent minimum sodium montmorillonite; 90 percent minimum passing No. 20 mesh sieve and 10 percent maximum passing No. 200 mesh sieve.

B. Single Panels: Single corrugated core, smooth-faced kraft paper panels, core filled with self-expanding bentonite clay granules:

1. Nominal Panel Size: 48 by 48 by 3/16 inches.
2. Minimum Bentonite Fill: 1 lb./sq. ft..
3. Minimum Panel Weight: 18 lb.

C. Joint Packing: Water-soluble plastic tube filled with bentonite clay granules; 2-inch diameter by 24 inches long.

D. Joint and Detail Mastic: Moist and hydrated bentonite clay gel using water and glycol for below-freezing application and water for above-freezing application.

2.3 ACCESSORIES

A. Fasteners: Galvanized nails.

B. Adhesive: Manufacturer-recommended type.

C. Polyethylene Sheet: 4-mil thick.

D. Flexible Flashings:

1. Self-adhered type.
2. Furnished by bentonite panel manufacturer.

E. Protection Board: 1/4-inch-thick asphalt wood fiberboard.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify that substrate surfaces are smooth and durable and are free of frozen matter, standing water, or foreign matter detrimental to application of waterproofing system.

C. Verify that items penetrating surfaces to receive waterproofing are securely installed.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Clean and prepare surfaces to receive waterproofing.

C. Remove concrete fins, projections, and form ties.

D. Fill holes, cracks, honeycombs, and voids with non-shrink cementitious grout; trowel level with monolithic wall surface.

E. Seal construction joints with joint and detail mastic, minimum 1/8 inch thick and extending 3 inches beyond joints.

F. Seal all vertical inside corners with continuous 3/4-inch fillet of joint and detail mastic.

3.3 INSTALLATION

A. Vertical Surfaces:

1. Apply single layer of bentonite panels with adhesive, starting at base of foundation.
2. Fold and secure panels around corners with vertical corrugations; secure unfolded panels with horizontal corrugations.
3. Cut panels at bottom to lap minimum 6 inches onto surface of footing.
4. Lap adjoining panels 1-1/2 inches; lap horizontal joints shingle-style.
5. Stagger vertical joints at mid-panel on succeeding courses.
6. Cut panels parallel to corrugations to prevent bentonite loss.
7. Place joint packing continuous at termination of panels and at protrusions or penetrations; secure to prevent movement.
8. Termination:
    a. Apply continuous strip of manufacturer's self-adhered flashing membrane and detail mastic over top edge of bentonite panel, lapped 4 inches at end joints and over top of bentonite panels.

B. Horizontal Surfaces below Slabs:

1. Place polyethylene sheet over substrate; lap joints 4 inches.
2. Joints:

    a. Apply single layer of bentonite panels with joints lapped 1-1/2 inches.
    b. Secure laps to prevent displacement.
    c. Stagger joints of adjoining panel rows.

3. Cut panels parallel to corrugations to prevent bentonite loss.
4. Do not extend bentonite panels over pile caps or footings supporting slab edges.
5. Place temporary protective polyethylene sheet over installed panels.
6. Sealing:

    a. Trowel joint seal to beads 1 inch high around penetrations and 1/2 inch high around chair legs not placed on pads.
    b. Cover beads with polyethylene sheet collars, cut to size.

7. Align bentonite panels with edge of slab, protect with polyethylene sheet except in areas inaccessible after form stripping.

C. Concrete Horizontal Surfaces below Grade:

1. Apply single bentonite panels with masonry nails.
2. Fold and secure panels around corners with vertical corrugations.
3. Lap adjoining panels 1-1/2 inches.
4. Stagger vertical joints minimum 16 inches on succeeding courses.
5. Cut panels parallel to corrugations to prevent bentonite loss.
6. Extend panels up vertical surfaces minimum 12 inches to overlap vertically applied bentonite panels.
7. Trowel bentonite joint and detail mastic continuous along and around protrusions and penetrations and at abutting walls; secure to prevent movement.

D. Accessories:

1. Joint Packing:

    a. Install joint packing tubes in continuous line over bentonite panel joint at intersection of vertical and horizontal surfaces.
    b. Temporarily secure in place in preparation for backfill.

2. Place drainage panel directly against membrane, butt joints, and place to direct drainage downward.
3. Place protection board directly against drainage panel; butt joints.
4. Attach protection board to substrate with mastic; scribe and cut boards around projections, penetrations, and interruptions.

3.4 PROTECTION

A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Do not permit traffic over unprotected or uncovered waterproofing.

C. Temporary Sheeting:

1. Protect installed waterproofing from precipitation or ground water with temporary polyethylene sheeting.
2. When backfilling begins, remove sheeting.

3.5 SCHEDULE

A. Elevator Pits: All horizontal and vertical surfaces.

END OF SECTION 071700

SECTION 071816 – VEHICULAR TRAFFIC COATINGS

PART 1 GENERAL

1.1 SUMMARY

A. Provide labor, materials, equipment and supervision necessary to install a fluid-applied vehicular traffic coating system as outlined in this specification to new or existing concrete surfaces.

B. The manufacturer's application instructions for each product used are considered part of this specification and should be followed at all times.

C. Related Sections:
1. Section 03 30 00: Cast-in-Place Concrete
2. Section 07 90 00: Joint Protection

1.2 SYSTEM DESCRIPTION

A. A complete system of compatible materials to create a seamless waterproof membrane with integral wearing surface.

B. System shall be designated for application on the specific type of deck indicated on the drawings.

1.3 SUBMITTALS

A. Technical Data: Submit manufacturer's product data and Safety Data Sheets (SDS) on each product.

B. Samples: Submit samples of specified vehicular traffic coating system. Samples shall be construed as examples of finished color and texture of the system only.

C. Applicator Approval: Submit letter from manufacturer stating applicator is approved to install the specified vehicular traffic coating system.

D. Warranty: Submit copy of manufacturer's standard warranty.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Applicator shall be approved to install specified system.

B. Requirement of Regulatory Agencies: Comply with applicable codes, regulations, ordinances and laws regarding use and application of coating systems.

C. Field Sample:

1. Install a field sample of at least 100 square feet at the project site or pre-selected area as agreed to by owner's representative, applicator and manufacturer.
2. Apply material in accordance with manufacturer’s written application instructions.

3. Field sample will be standard for judging color and texture on remainder of project.
4. Maintain field sample during construction for workmanship comparison.
5. Do not alter, move, or destroy field sample until work is completed and approved by Owner’s representative.

1.5 DELIVERY, STORAGE AND HANDLING

A. Delivery: Materials shall be delivered in original sealed containers, clearly marked with supplier's name, brand name and type of material.

B. Storage and Handling: Recommended material storage temperature is 75°F (23°C). Handle products to prevent damage to container. All materials shall be stored in compliance with local fire and safety requirements. Do not store at high temperatures or in direct sunlight.

1.6 PROJECT CONDITIONS

A. Prior to starting work, read and follow the SDS and container labels for detailed health and safety information.

B. Only proceed with application of materials when substrate temperature is 40°F (4°C) or greater. Do not proceed if precipitation is imminent. Only apply to dry, clean surfaces; do not apply to damp, dirty, or frosty surfaces. Ambient temperature should be a minimum 40°F (4°C) and rising, and more than 5°F (3°C) above dew point. Take special precautions when ambient and/or substrate temperatures are approaching, at, or above 100°F (38°C); it may be necessary to limit material application to evening hours for exterior exposed decks.

C. Coordinate waterproofing work with other trades. Applicator shall have sole right of access to the specified area for the time needed to complete the application and allow the vehicular traffic coatings to cure adequately.

D. Protect plants, vegetation or other surfaces not to be coated against damage or soiling.

E. Keep products away from spark or flame. Do use equipment which may produce sparks during application and until all vapors have dissipated. Post "No Smoking" signs.

F. Maintain work area in a neat and orderly condition, removing empty containers, rags and trash daily from the site.

1.7 WARRANTY

A. Upon request, Neogard shall offer a manufacturer's standard warranty for institutional, commercial, industrial, and high-rise/multi-family residential projects only, after substantial completion of the application and receipt of a properly executed warranty request form.

PART 2 MATERIALS

2.1 MANUFACTURER

A. Sika:
   1. System: Sika 720 One Shot

B. Neogard, 2728 Empire Central, Dallas, TX 75235, (800) 321-6588, www.neogard.com.
   Product: Auto-Gard E.
   1. System: Auto-Gard

C. Substitutions: Under provisions of Section 01 60 00 – Product Requirements

2.2 MATERIALS

A. Materials:
   1. Primer: Concrete and metal primers as required.
   2. Flashing Tape:flashing tape.
   3. Reinforcing Fabric: 86220 (63BJB) reinforcing fabric (Tietex T-272).
   4. Sealant: 70991 (47XJB) urethane sealant.
   5. Aggregate (choose one):
      a. 7992-U (66EJB) silica quartz sand.
      b. #16 aluminum oxide.
   6. Base Coat: FC7500/FC7960 (45063) urethane.
   7. Wear Coat (choose one):
      a. 70714/70715-09 (45062) pigmented 100% solids epoxy.
      b. 70750/70751 (472JB) low-modulus epoxy.
   8. Topcoat (choose one):
      a. Epoxy: 70714/70715-09 (45062) pigmented 100% solids epoxy.
      b. Urethane: FC7540/FC7964 (47QJB) aliphatic urethane.

2.3 MATERIAL PERFORMANCE CRITERIA

A. Typical physical properties of cured FC7500/FC7960 urethane used on this project are:
   1. Tensile Strength, ASTM D412, 1,500 psi
   2. Elongation, ASTM D412, 500%
   3. Permanent Set, ASTM D412, < 20%
   4. Tear Resistance, ASTM D1004, 150 pli
   5. Shore A, ASTM D2240, 74–79
   6. Water Resistance, ASTM D471, 1% at 7 days
   7. MVT (20 mils), ASTM E96, 5 English Perm
   8. Adhesion, ASTM 4541, 400 psi

B. Typical physical properties of cured 70750/70751 low-modulus epoxy used on this project are:
   1. Tensile Strength, ASTM D638, 1,362 psi ± 100
   2. Elongation, ASTM D638, 81% ± 10
   3. Flexural Strength, ASTM D790, 1,100 psi
   4. Taber Abrasion, ASTM D4060, 60 mg/1,000 CS-17
   5. Shore D, ASTM D2240, 65
   6. Modulus of Elasticity, ASTM D790, 42,000 psi
   7. Adhesion to Concrete, ASTM D4541, 960 psi
   8. Water Resistance, ASTM D570, 1.3% at 24 hours

C. Typical physical properties of cured 70714/70715-09 epoxy used on this project are:

1. Tensile Strength, ASTM D638, 2,000 psi
2. Elongation, ASTM D638, 40%
3. Compressive Strength, ASTM D695, 15,000 psi
4. Flexural Strength, ASTM D790, 1,900 psi
5. Flexural Modulus, ASTM D790, 62,000 psi
6. Water Resistance, ASTM D570, 0.17%
7. MVT (10 Mils), ASTM E96, 0.18 Perm
8. Shore D, ASTM D2240, 77
9. Adhesion, ASTM D4541, 400 psi
10. Impact Flexibility, ASTM D6905-03, Pass (120 in/lb)
11. Flammability, ASTM D635, Pass
12. Taber Abrasion, ASTM D4060, 61 mg (1,000 CS-17)

D. Typical physical properties of cured FC7540/FC7964 urethane used on this project are:
1. Tensile Strength, ASTM D412, 2,000 psi
2. Elongation, ASTM D412, 130%
3. Permanent Set, ASTM D412, < 10%
4. Tear Resistance, ASTM D1004, 155 pli
5. Water Resistance, ASTM D471, < 2% (7 days)
6. MVT (20 mils), ASTM E96, 1.0 English Perm
7. Taber Abrasion, ASTM D4060, 95 mg (1,000 CS-17)
8. Shore A, ASTM D2240, 80–90
9. Adhesion, ASTM D4541, 400 psi

E. Meet Class A requirements for ASTM E108, "Standard Test Methods for Fire Tests of Roof Coverings."

F. The above tested results are typical values. Individual lots may vary up to 10% from the typical value.

2.4 ACCESSORIES

A. Miscellaneous materials such as cleaning agents, adhesives, reinforcing fabric, backer rod, deck drains, and others shall be compatible with the specified vehicular traffic coating system.

2.5 MIXING

A. Comply with manufacturer's instructions for mixing procedures.

PART 3 EXECUTION

3.1 EXAMINATION

A. Concrete: Verify that the work done under other sections meets the following requirements:
1. That the concrete deck surface is free of ridges and sharp projections. If metal forms or decks are used they should be ventilated to permit adequate drying of concrete.
2. That the concrete was cured for a minimum of 28 days. (Minimum of 4,000 psi

compressive strength). Water-cured treatment of concrete is preferred. The use of concrete curing agents, if any, shall be of the sodium silicate base only.

3. That the concrete was finished by a power or hand steel trowel followed by soft hair broom to obtain light texture or “sidewalk” finish.
4. That damaged areas of the concrete deck be restored to match adjacent areas. Use 70714/70715-09 (45062) clear epoxy and sand for filling and leveling.

3.2 PREPARATION

A. Cleaning: Surfaces contaminated with oil or grease shall be vigorously scrubbed with a stiff bristle broom and a strong non-sudsing detergent such as Neogard 8500 BioDegradable Cleaner (089JB). Thoroughly wash, clean, and dry. Areas where oil or other contaminants penetrate deep into the concrete may require removal by mechanical methods.

B. Shot-Blasting: Required surface preparation method for remedial construction is also the preferred method for new construction. Mechanically prepare surface by shot-blasting to industry standard surface texture (ICRI's CSP3-CSP4) without causing additional surface defects in substrate. Shot-blasting does not remove deep penetrating oils, grease, tar or asphalt stains. Proper cleaning procedures should be followed to ensure proper bonding of the deck coating.

C. Acid Etching: If shot blasting is not practical, treat concrete surfaces with 10% to 15% solution of muriatic acid to remove laitance and impurities. After acid has stopped foaming or boiling, immediately rinse thoroughly with water. Re-rinse as required to remove muriatic acid solution. Acid etching does not remove deep penetrating oils, grease, tar or asphalt stains. Proper cleaning procedures should be followed to ensure proper bonding of the deck coating.

D. Cracks and Cold Joints: Visible hairline cracks (less than 1/16" in width) in concrete and cold joints shall be cleaned, primed as required and treated with thoroughly mixed FC7500/FC7960 base coat material a minimum distance of 2" on each side of crack to yield a total thickness of 30 dry mils. Large cracks (greater than 1/16" in width) shall be routed and sealed with 70991 sealant. Sealant shall be applied to inside area of crack only, not applied to deck surface. Detail sealed cracks with thoroughly mixed FC7500/FC7960 base coat material a distance of 2" on each side of crack to yield a total thickness of 30 dry mils.

E. Control Joints: Seal control joints equal to or less than 1" in width with 70991 urethane sealant. Depending on the width to depth ratio of the joint, backing material and a bond breaker may be required. Install sealants in accordance with ASTM C1193 and manufacturer's instructions. Detail sealed joints with thoroughly mixed FC7500/FC7960 base coat material a distance of 2" on each side of joint to yield a total thickness of 30 dry mils.

F. Flashing Tape: Install flashing tape and reinforcing fabric where indicated on the drawings and/or where required by the manufacturer prior to the application of base coat.

G. Surface Condition: Surface shall be clean and dry prior to coating.

3.3 APPLICATION

A. Factors That Affect Dry Film Thickness: Volume of solids, thinning, surface profile, application technique and equipment, overspray, squeegee, brush and roller wet out, container residue, spills and other waste are among the many factors that affect the amount of wet coating required to yield proper dry film thickness. To ensure that specified dry film thickness is achieved, use a wet mil gauge to verify actual thickness of wet coating applied, adjusting as needed for those factors which directly affect the dry film build.

B. Seed and Lock Method:
   1. Primer: Where required, thoroughly mix primer and apply at a rate of 300 sf/gal (0.33 gal/100 sf) to all concrete surfaces. Within 24 hours of application of primer, base coat must be applied. If base coat cannot be applied within 24 hours, inspect surface for contaminants, clean surface as necessary, and re-prime.
   2. Base Coat: Thoroughly mix 70410 base coat material and apply at a rate of 60 sf/gal (1.66 gal/100 sf or 26 wet mils), to yield 20 dry mils. Extend base coat over cracks and control joints which have received detail treatment.
   3. Wear Coat: Thoroughly mix 7430 series wear coat material and apply at a rate of 150 sf/gal (0.66 gal/100 sf or 10 wet mils) to yield 8 dry mils, and immediately broadcast aggregate, evenly distributed, into wet coating at the rate of 15 lbs/100 sf. When dry, remove excess aggregate.
   4. Heavy Duty Areas Only: For heavy traffic areas such as ticket booths, spiral ramps, turn areas, or in other areas subjected to high traffic abrasion, heavy duty application is required. In such areas, thoroughly mix 7430 wear coat material and apply a second wear coat at a rate of 100 sf/gal (1.0 gal/100 sf or 16 wet mils) to yield 12 dry mils, and immediately broadcast additional aggregate, evenly distributed, into wet coating at a rate of 10 lbs/100 sf. When dry, remove excess aggregate.
   5. Topcoat: Thoroughly mix 7430 topcoat material and apply at a rate of 100 sf/gal (1.0 gal/100 sf or 16 wet mils) to yield 12 dry mils.
   6. Standard system coating thickness is 40 dry mils exclusive of primer and aggregate. Heavy duty application areas will yield 52 dry mils exclusive of primer and aggregate.

C. Applicator is responsible for applying sufficient coating to the substrate.

3.4 CLEANING

A. Remove debris resulting from completion of coating operation from the project site.

B. Refer to the Manufacturer’s Manual for typical cleaning methods.

3.5 PROTECTION

A. After completion of application, do not allow traffic on coated surfaces for a period of at least 24-36 hours at 75°F (23°C) and 50% relative humidity, or until completely cured.

3.6 SCHEDULE

A. Floor of top level of Parking Garage, including ramp down to lower level.

END OF SECTION 071816

SECTION 076100 - STANDING SEAM ROOF PANELS

PART 1 - GENERAL.

1.1 DESCRPTION.

A. Work described in this section includes pre-formed metal roofing system complete with clips, perimeter and penetration flashing, closures, gutters, and down spouts.

B. Related work specified elsewhere:

1. Structural steel.

2. Flashing and sheet metal. (Not roof panel related).

1.2 SUBMITTALS.

A. Shop drawings: Show roof panel system with flashings and accessories in plan and elevation; sections and details. Include metal thickness' and finishes, panel lengths, joining details, anchorage details, flashings and special fabrication provisions for termination and penetrations. Indicate relationships with adjacent and interfacing work. Shop drawings to be prepared by metal roof panel manufacturer.

B. Design Test Reports.

1. Submit copies of design test reports for each of the performance testing standards listed in specification section 1.6.

2. Test reports shall be performed by independent, accredited test in laboratories, and shall bear the seal of a registered professional engineer.

C. Warranty: Provide unexecuted specimen warranty documents for each warranty as required in specification section 1.7.

D. Samples.

1. Submit sample of panel section, at least 6" x 6" showing seam profile and also a sample of color selected.

2. Submit sample of panel clip, gable clip, batten seam cap with sealant, and preformed metal and foam closures.

1.3 DELIVERY, STORAGE, AND HANDLING.

A. Inspect materials upon delivery.

B. Handle materials to prevent damage.

C. Store materials off ground providing for drainage; under cover providing for air circulation; and protected from any debris.

1.4 REFERENCE STANDARDS.

A. American Architectural Manufacturer Association (AAMA):

1. AAMA 501.1: Standard Test Method for Metal Curtain Walls for Water Penetration using Dynamic Pressure.

B. American Iron and Steel Institute (AISI):

1. SG02-1: 2001 Edition of the North American Specification for the Design of Cold-Formed Steel Structural Members.

C. American Society for Testing and Materials (ASTM):

1. A653-03: Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by theHot-Dip Process.

2. A792-03: Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

3. B209-02a: Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

4. D1056-00: Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.

5. D1970-01: Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.

6. D3575-00e1: Standard Test Methods for Flexible Cellular Materials made from Olefin Polymers.

7. E1592-01: Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.

8. E1646-95(2003): Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.

9. E1680-95(2003): Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems.

10. E1886-02: Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.

11. E2140-01: Standard Test Method for Water Penetration of Metal Roof Panels Systems by Static Water Pressure Head.

D. Factory Mutual Approvals (FM):

1. FM 4471, August 1995: Approval Standard for Class I Panel Roofs.

E. Florida Building Code (FBC):

1. TAS 201-95.1: Impact Test Procedures.

2. TAS 203-95.1: Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.

F. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):

1. Architectural Sheet Metal Manual, 5th edition.

G. Underwriters Laboratory (UL):

1. UL 580, 4th Ed.: Standard for Tests for Uplift Resistance of Roof Assemblies.

2. UL 790, 7th Ed.: Standard for Tests for Fire Resistance of Roof Covering Materials.

1.5 QUALITY CRITERIA/INSTALLER QUALIFICATIONS.

A. Engage an experienced metal roofing contractor (erector) to install standing seam system who has a minimum of three (3) years experience specializing in the installation of structural standing seam metal roof systems.

B. Contractor must be certified by manufacturer specified as supplier of standing seam system and obtain written certification from manufacturer that installer is approved for installation of specified system.

C. Successful contractor must obtain all components of roof system from a single manufacturer. Any secondary products that are required which cannot be supplied by the specified manufacturer must be recommended and approved in writing by primary manufacturer prior to bidding.

D. Fabricator/Installer shall submit work experience and evidence of adequate financial responsibility. Architect reserves the right to inspect fabrication facilities in determining qualifications.

E. Applicable erection tolerances: Maximum variation from true planes or lines: 1/4" in 20'-0"; 3/8" in 40'-0" or more.

1.6 DESIGN AND PERFORMANCE CRITERIA.

A. Thermal Expansion and Contraction.

1. Completed metal roofing and flashing system shall be capable of withstanding expansion and contraction of components caused by changes in temperature without buckling, or reducing performance ability.

2. The design temperature differential shall be not less than +/- 220 degrees F.

3. Interface between panel and clip shall provide for unlimited thermal movement in each direction along the longitudinal direction.

B. Uniform Wind Uplift Load Capacity.

1. Installed roof system shall withstand negative wind uplift pressures complying with the following criteria.

   a. Design Code: ASCE 7, Method 2 for Components and Cladding.

   b. Safety Factor: 1.65 after any load reduction or material stress increase.

   c. Category IV.

   d. Wind Speed: 133 mph.

   e. Exposure Category: B.

   f. Mean Roof Height: See drawings.

   g. Minimum Building Width: See drawings.

   h. Roof Pitch: See drawings.

2. Capacity shall be determined using defined method in accordance with ASTM E 1592, testing of sheet metal roof panels.

C. Uniform Positive Load Capacity.

1. Uniform positive load capacity shall be determined in accordance with AISI SG02-1.

2. The installed roof system shall be capable of resisting the following positive uniform roof loads: Roof Live Load of 20 psf.

3. Installed roof system shall carry positive uniform design loads with a maximum system deflection of L/180 as measured at the rib (web) of the panel.

D. Wind Uplift Classification: The panel system shall be listed as a Class 90 windstorm rated system, as determined by UL 580.

E. Fire Resistance Classification: The panel system shall be listed as a Class A fire rated system, as determined by UL 790.

F. Air infiltration: The panel system shall be tested in accordance with ASTM E1680, and meet or exceed the following performance requirements:

Pressure	**Area Leakage Rate**
1.57 PSF	0.0012 cfm/sq.ft.
6.24 PSF	0.0001cfm/sq.ft.
20.0 PSF	0.0011 cfm/sq.ft..

G. Static air pressure water infiltration: The panel system shall be tested in accordance with ASTM E1646, and meet or exceed the following performance requirements:

Pressure	**Result**

5 Gal/Hr per S.F. and Static Air Pressure of 20.0 psf for 15 minutes	No Leakage

H. Static water pressure head water infiltration: The panel system shall be tested in accordance with ASTM E2140, and pass with no leakage. The test specimen must include a panel end lap condition and successfully withstand being submerged under 6" of water.

I. Dynamic pressure water penetration: The panel system shall be tested in accordance with AAMA 501.1, and pass with no water penetration, other than condensation, when exposed to dynamic rain and 70 mph wind velocities for not less than five minutes duration

J. Class I Panel Rating: The specified panel system shall be listed as Class I Panel Roof, in accordance with FM 4471. The tested system shall be identical to the specified panel for this project with regard to profile, gauge, width, and material. The anchor clip spacing as defined in these test reports shall not be larger than the anchor clip spacing specified for this project.

1.7 WARRANTIES.

A. Endorse and forward to owner the following warranties:

1. 20 year waterrtight warranty, jointly signed by the installer and the manufacturer.
2. Manufacturer's standard 20 year finish warranty covering checking, crazing, peeling, chalking, fading, and adhesion.
3. Installer's 3 year warranty covering roof panel system installation and watertightness.

B. Warranties shall commence on date of substantial completion.

PART 2 - PRODUCTS

2.1 STANDING SEAM ROOFING SYSTEM.

A. Manufacturer:

1. Imetco Series 300 (S300) roof panel system as manufactured by Innovative Metals Company, Inc. (Imetco), Tucker, Georgia, telephone 1-800-646-3826.
2. MBC – Lok Seam
3. Substitutions: Substitutions under provisions of Section 01 25 00 – Substitution Procedures and Section 01 60 00 – Product Requirements.

B. Materials.

1. Panel materials: 22 gauge, G90 galvanized steel per ASTM A653 or AZ50.

2. Flashing and flat stock material: Fabricate in profiles indicated on drawings of same material, thickness, and finish as roof panel system, unless indicated otherwise.

C. Finish on exposed surfaces. (Both sides of panel is exposed and shall have coating system.)

1. Two coat coil applied, baked-on full-strength (70% resin) fluorocarbon coating system (polyvinylidene fluoride, PVF2), applied by manufacturer's approved applicator.

2. Coating system shall provide nominal 1.0 mil dry film thickness, consisting of primer and color coat.

a. Color: Custom color selected by architect.

3. Unexposed surfaces shall be baked-on polyester coating with .20 - .30 total dry film thickness (TDF).

D. Characteristics.

1. The same panel profile from a single manufacturer shall be used for ALL standing seam roof areas.

2. Configuration: Standing seams incorporating mechanically interlocked, concealed anchor clips which allow unlimited thermal movement.

a. Profile of panel shall have two stiffening beads positioned 1 ½" from the vertical seam and two longitudinal stiffening striations equally spaced.

b. Exposed fasteners, screws and/or roof mastic are unacceptable and will be rejected. System configuration only allows for exposed fasteners at panel overlap (if required and approved) and trim details (as per manufacturer's guidelines).

c. Panels must be furnished in continuous lengths from ridge to eave with no overlaps unless approved by manufacturer to length of run.

3. Seam must be 2-3/8" minimum height for added strength for negative pressures and must have symmetrical design. Integral, asymmetrical seams are not acceptable.

4. Site Formed Panels: Panels in excess of shippable length shall be formed on-site. Site formed panels shall meet each of the following requirements:

a. Panels shall be formed on heavy duty factory type rollformers with no fewer than 16 forming stations to improve quality and minimize oil canning.

b. Panels shall be of identical profile and characteristics as factory formed panels and specimens used as the basis of performance tests.

c. Sealant shall be factory applied in a separate factory formed snap on cap. Site/field applied seam sealant is unacceptable. Seam caps may be shipped in 45' or less length and lap spliced over full length panels in accordance with manufacturer's system details.

d. Site rollforming equipment shall be owned and maintained by the panel manufacturer and operated by the panel manufacturer's trained full time experienced technician. The installer must provide additional personnel to handle raw materials and finished product as necessary.

5. Concealed Standard Anchor Clips: Clips must be 16 gauge Galv. steel, ONE (1) piece clip with projecting legs for additional panel alignment and provision for unlimited thermal movement in each direction along the longitudinal dimension.

   a. Two-piece clips are NOT acceptable.

   b. Clip design must isolate sealant in panel cap from clip to insure that no sealant damage occurs from the clip during expansion and contraction.

   c. Clip must maintain a clearance of a minimum of 3/8" between panel and substrate for proper ventilation to help prevent condensation on underside of panel and eliminate the contact of panel fastener head to panel.

6. Seam cap: Snap-on cap shall be a minimum of 1" wide "T" shaped of continuous length up to 45 feet according to job conditions and field seamed by means of manufacturer's standard seaming machine.

   a. Cap shall be designed to receive two (2) beads of continuous hot applied gasketing sealant during manufacturing which will not come in contact with the anchor clip.

   b. In all cases, seam caps shall be factory formed to insure quality and precision in the process of sealant application.

7. Standing Seam Panel Width: 16" (nominal).

8. Stiffening ribs: Located in flat of panel to minimize oil canning and telegraphing of structural members.

9. Replaceability: Panels shall be of a symmetrical design with mechanically seamed cap configuration such that individual panels may be removable for replacement without removing adjacent panels.

10. Panel ends shall be folded up 90 degrees at ridge, headwall, and hip conditions, where applicable. No metal shall be cut or otherwise perforated at the folded end.

E. Accessories.

1. Gable anchor clips: 16 gauge galvanized steel ***or*** 16 gauge stainless steel alloy 410.

2. Fasteners.

   a. Concealed fasteners: Corrosion resistant steel screws, #10 x length appropriate for substrate, pancake head, Phillips or Square drive. Use self-drilling, self-tapping for metal substrate or A-point for plywood substrate.

   b. Exposed fasteners: 300 series stainless steel screws (cadmium or zinc coatings are not acceptable) with neoprene sealing washer, or 1/8" diameter stainless steel rivets.

2. Closures: Factory precut closed cell foam meeting ASTM D1056 and/or D3575, enclosed in metal channel matching panels when used at hip, ridge, rake, head, and jamb.

3. Provide all miscellaneous accessories for complete installation.

2.2 ACCESSORY PRODUCTS.

A. Sealant.

1. Acceptable product.

a. Concealed Application: Non-curling butyl sealant or equal.

b. Exposed Application: Tripolymer or polurethane sealant or equal.

2. Colors: As selected by architect from sealant manufacturer's standard selection.

B. Bearing Plates.

1. Install bearing plates directly over rigid board insulation/underlayment at each anchor clip location.

2. Bearing plates shall be 3” x 5” x 16 gauge (minimum) galvanized steel.

3. Bearing plates shall be pre-punched with a hole pattern matching that of the panel anchor clips. Slotted holes are acceptable.

2.3 FABRICATION

A. Shop fabricate metal roofing and flashing components to the maximum extent possible, forming metal work with clear, sharp, straight, and uniform bends and rises. Hem exposed edges of flashings.

B. Form flashing components from full single width sheet in minimum 10'-0" sections. Provide mitered corners, joined using closed end pop rivets and joint sealant.

C. Fabricate roofing and related sheet metal work in accordance with approved shop drawings and applicable standards.

PART 3 - EXECUTION

3.1 PREPARATION

A. Inspection: Examine the alignment and placement of the building structure and substrate. Correct any objectionable warp, waves or buckles in the substrate before proceeding with installation of the pre-formed metal roofing. The installed roof panels will follow the contour of the structure and may appear irregular if not corrected.

B. Establish straight side and crosswise benchmarks.

C. Use proper size and length fastener for strength requirements. Approximately 5/16” is allowable for maximum fastener head size beneath the panel.

D. Rectangular Roofs shall be checked for square and straightness. Gable ends may not be straight; set a true line for the gable clips and flashing with string line.

E. Measure the roof lengthwise to confirm panel lengths, overhangs, coverage of flashings at eaves and ridges and verify clearances for thermal movement.

3.2 ROOFING AND FLASHING INSTALLATION.

A. All details will be shown on manufacturer’s shop drawings to successful bidder; install roofing and flashings in accordance with approved shop drawings and manufacturer's product data, within specified erection tolerances.

B. Prepare roof for the installation of standing seam panels, including:

1. Install all directly on structural steel framing system.

C. Installation of Roof Panels: Roof panels can be installed by starting from end and working towards the opposite end. Due to the symmetrical design of the specified panel system, it is also acceptable to start from the middle of the roof and work toward each end.

1. A stainless steel pop rivet shall be secured through the anchor reveal of the panel leg and extend into the arms of the panel clip located at the ridge of the system. This is done at each arm of the clip along the ridge. The panel is then anchored at both sides of the clip.

a. Be sure to capture all drilling debris during this operation with a rag or cloth placed on the panels at the drilling operation.

b. Panels are not securely attached to the roof until fixed to the anchor clip. To avoid damage and injury, all panels shall be fixed to the anchor clip immediately as they are installed.

2. The seam caps are shipped with two (2) beads of factory applied hot melt sealant located inside the caps. To install the caps, hook one side of the cap over the panel edge and rotate over the opposite panel leg. For ease of installation, start at one end of the panel and work toward the opposite end.

3. A hand crimping tool is used to crimp the cap around the top of two adjacent panels.

4. Caps shall then be permanently seamed with manufacturers mechanical seamer.

D. Isolate dissimilar metals and masonry or concrete from metals with bituminous coating. Use gasketed fasteners where required to prevent corrosive action between fastener, substrate, and panels.

E. Limit exposed fasteners to extent indicated on shop drawings.

F. Seal laps and joints in accordance with roofing system manufacturer's product data.

G. Coordinate flashing and sheet metal work to provide weathertight conditions at roof terminations. Fabricate and install in accordance with standards of SMACNA Manual.

H. Provide for temperature expansion/contraction movement of panels at roof penetrations and roof mounted equipment in accordance with system manufacturer's product data and design calculations.

I. Installed system shall be true to line and plane and free of dents, and physical defects. In light gauge panels with wide flat surfaces, some oil canning may be present. Oil canning does not affect the finish or structural integrity of the panel and is therefore not cause for rejection.

J. Maximum variation from true planes or lines shall be 1/4” in 20 feet and 3/8” in 40 feet of more.

K. Form joints in linear sheet metal to allow for 1/4" minimum expansion at 20'-0" o.c. maximum and 8'-0" from corners.

L. At joints in linear sheet metal items, set sheet metal items in two 1/4" beads of butyl sealant. Extend sealant over all metal surfaces. Mate components for positive seal. Allow no sealant to migrate onto exposed surfaces.

M. Remove damaged work and replace with new, undamaged components.

N. Touch up exposed fasteners using paint furnished by roofing panel manufacturer and matching exposed panel surface finish.

O. Clean exposed surfaces of roofing and accessories after completion of installation. Leave in clean condition at date of substantial completion. Touch up minor abrasions and scratches in finish.

END OF SECTION 076100

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Flashings and counterflashings.
2. Copings, flashings and counterflashings.
3. Reglets and accessories.
4. Other fabricated sheet metal items required to keep building weathertight and not specified elsewhere.

B. Related Requirements:

1. Section 031000 - Concrete Forming and Accessories: Placement of recessed and concealed reglets and accessories.
2. Section 079000 - Joint Protection: Sealants and sealers.

1.2 REFERENCE STANDARDS

A. Aluminum Association:

1. AA - Designation System for Aluminum Finishes.

B. American Architectural Manufacturers Association:

1. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
2. AAMA 612 - Voluntary Specification, Performance Requirements, and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum.
3. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
4. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
5. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

C. ASTM International:

1. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
2. ASTM A625/A625M - Standard Specification for Tin Mill Products, Black Plate, Single-Reduced.
3. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

4. ASTM A755/A755M - Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
5. ASTM B32 - Standard Specification for Solder Metal.
6. ASTM B101 - Standard Specification for Lead-Coated Copper Sheet and Strip for Building Construction.
7. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
8. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).
9. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction.
10. ASTM B749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
11. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
12. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
13. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free.

D. Copper Development Association Inc.:

1. CDA - Copper in Architecture - Design Handbook.

E. Federal Specification Unit:

1. FS TT-C-494 - Coating Compound, Bituminous, Solvent Type, Acid Resistant.

F. National Roofing Contractors Association:

1. NRCA - Construction Details Manual.

G. Sheet Metal and Air Conditioning Contractors' National Association:

1. SMACNA - Architectural Sheet Metal Manual.

H. Specialty Steel Industry of North America:

1. SSINA - Standard Practices for Stainless Steel Roofing, Flashing, Copings.

1.3 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturer information regarding components metal types, finishes, and characteristics.

C. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

D. Samples:
   1. Submit two samples, 12 by 12 inches in size, illustrating metal finish color.

E. Fabricator's Certificate: Certify that products meet or exceed specified requirements.

F. Qualifications Statements:

   1. Submit qualifications for fabricator and installer.

1.5 QUALIFICATIONS

A. Fabricator: Company specializing in fabricating products specified in this Section with minimum three years' documented experience.

B. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

C. Storage:

   1. Store materials according to manufacturer instructions.
   2. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation.
   3. Slope metal sheets to ensure drainage.

D. Protection:

   1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
   2. Prevent contact with materials that may cause discoloration or staining.
   3. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.1 SHEET METAL FLASHING AND TRIM

A. Performance and Design Criteria:

1. Sheet Metal Flashings: Comply with the latest version of the SMACNA Manual:

2.2 MATERIALS

A. Prefinished Galvanized Steel Sheet:

1. Description:

a. Structural steel sheet.
b. Type: Thick core.
c. Coating: Zinc; G90.

2. Comply with ASTM A755/A755M.
3. Thickness: 0.024 inch.
4. Coating:

a. Shop precoated with three-coat fluoropolymer.
b. Color: custom color.

2.3 FABRICATION

A. Form section shapes as indicated on Drawings, accurate in size, square, and free from distortion or defects.

B. Fabricate cleats of same material as sheet metal, interlocking with sheet.

C. Form pieces in longest possible lengths.

D. Hem exposed edges on underside 1/2 inch.

E. Miter and seam corners.

F. Forming:

1. Form material with standing seams, except where otherwise indicated.
2. At moving joints, use sealed, lapped, bayonet-type, or interlocking hooked seams.

G. Soldering:

1. Tin edges of copper sheet to be soldered.
2. Solder shop-formed metal joints.
3. After soldering, remove flux and wipe and wash solder joints clean.
4. Weather seal joints.

H. Corners:

1. Fabricate corners from one piece with minimum 18-inch long legs.
2. Seam for rigidity and seal with sealant.

I. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

J. Flashings:

1. Fabricate flashings to allow toe to extend 2 inches over roofing paver.
2. Return and brake edges.

2.4 FINISHES

A. Fluoropolymer Coating:

1. Description: Multiple coats as specified for sheet metal system and thermally cured.
2. Comply with AAMA 2604.

B. Washcoat: Finish concealed side of metal sheets with washcoat compatible with finish system, as recommended by finish system manufacturer.

2.5 ACCESSORIES

A. Fasteners: Same material and finish as flashing metal , with soft neoprene washers.

B. Underlayment:

1. Description: Unperforated asphalt felt.
2. Comply with ASTM D226/D226M.
3. Type: II, No. 30.

C. Slip Sheet: Rosin-sized building paper.

D. Primer: Galvanized iron.

E. Protective Backing Paint: Bituminous, FS TT-C-494.

F. Sealant:

1. Type: Silicone.

G. Plastic Cement: Comply with ASTM D4586/D4586M, Type I.

H. Reglets:

1. Type: Recessed.
2. Material: stainless steel.

I. Solder:

1. Type: Suitable for application and material being soldered.
2. Comply with ASTM B32.
3. Used with noncorrosive flux.

J. Welding Electrodes and Filler Metal for Stainless Steel: TIG using rods made from alloy Type 308 stainless steel, as required for color match, strength, and compatibility in fabricated items.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify that roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets are in place, and nailing strips have been located.

C. Verify that roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Install starter strips, edge strips, and cleats before starting installation of sheet metal flashing and trim.

C. Reglets:

1. Install surface-mounted reglets to lines and levels as indicated on Drawings.
2. Seal top of reglets with sealant.

D. Paint concealed metal surfaces with protective backing paint to minimum dry film thickness of 15 mils.

3.3 INSTALLATION

A. Recessed Flashing Reglets:

1. As specified in Section 031000 - Concrete Forming and Accessories.
2. Insert flashings into reglets to form tight fit.
3. Secure in place with lead wedges.
4. Seal flashings into reglets with sealant.

3.4 ATTACHMENTS

A. Concealed Flashing and Counter Flashings:

1. Location:
    a. Roof termination
    b. Curb mounted equipment
    c. Roof penetrations
2. Material: Stainless steel, Type 304.

B. Exposed flashing and counter flashings:

1. Material: Prefinished galvanized steel.
2. Finish: Custom color as selected

END OF SECTION 076200

SECTION 079000 - JOINT PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sealants and joint backing.
2. Precompressed foam sealers.
3. Accessories.

B. Related Requirements:
1. Section 078400 - Firestopping: Firestopping sealants.

1.2 REFERENCE STANDARDS

A. ASTM International:

1. ASTM C834 - Standard Specification for Latex Sealants.
2. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications.
3. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
4. ASTM C1193 - Standard Guide for Use of Joint Sealants.
5. ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.
6. ASTM D1667 - Standard Specification for Flexible Cellular Materials - Poly(Vinyl Chloride) Foam (Closed-Cell).
7. ASTM D2628 - Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.

B. California Department of Health Services:

1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers.

C. South Coast Air Quality Management District:

1. SCAQMD Rule 1168 - Adhesive and Sealant Applications.

1.3 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with Sections referencing this Section.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturer information indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

C. Samples: Submit two samples, 3 inches in size, illustrating sealant colors for selection.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer Instructions: Submit special procedures, surface preparation requirements, and perimeter conditions requiring special attention.

F. Qualifications Statements:

1. Submit qualifications for manufacturer and applicator.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

B. Applicator: Company specializing in performing Work of this Section with minimum three years' documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

C. Store products according to manufacturer instructions.

D. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.7 AMBIENT CONDITIONS

A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.

B. Maintain temperature and humidity as recommended by sealant manufacturer during and after installation.

1.8 WARRANTY

A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.

B. Furnish five-year installer's and manufacturer’s warranty.

C. Include coverage for:

1. Installed sealants and accessories failing to achieve watertight seal.
2. Installed sealants and accessories exhibiting loss of adhesion or cohesion.
3. Sealants that do not cure.
4. Cracking, tearing, debonding, water penetration, and excessive permanent deformation.
5. Removal and replacement of adjacent materials necessary to complete repairs.

PART 2 - PRODUCTS

2.1 JOINT SEALERS

2.2 JOINT SEALERS BY APPLICATION

A. Type I High-Performance General-Purpose Exterior (Nontraffic) Sealant:

1. Material: Silicone.
2. Comply with ASTM C920, Grade NS, Class 25, Uses M, G, and A.
3. Type: Single-component.
4. Color: As selected.
5. Manufactured by Dow Corning: Model 790.
6. Applications:

a. Control, expansion, and soft joints in masonry.
b. Joints between concrete and other materials.
c. Joints between metal frames and other materials.
d. Other exterior nontraffic joints for which no other sealant is indicated.

B. Type 2 General-Purpose Traffic-Bearing Sealant:

1. Material: Polyurethane.
2. Comply with ASTM C920, Grade P, Class 25, Use T.
3. Type: Single-component.
4. Color: As selected.
5. Manufactured by Pecora: DynaTred.
6. Applications: Exterior and interior pedestrian and vehicular traffic-bearing joints.

C. Exterior Foam Expansion Joint Sealer:

1. Description: Precompressed foam sealer recommended by manufacturer for traffic-bearing use.
2. Material: Polyurethane with water repellent.
3. Color: Face color as selected.

4. Size: As required to provide watertight seal when installed.
5. Applications: Exterior wall and parking deck expansion joints.

D. Type 3 General Purpose Interior Sealant:

1. Material: Acrylic-emulsion latex.
2. Comply with ASTM C834.
3. Type: Single-component; paintable.
4. Color: As selected.
5. Applications:

a. Interior wall and ceiling control joints.
b. Joints between door and window frames and wall surfaces.
c. Other interior joints for which no other type of sealant is indicated.

2.3 JOINT SEALERS BY TYPE

A. Acrylic-Emulsion Latex Sealant:

1. Comply with ASTM C834.
2. Type: Single-component; non-staining, non-bleeding, non-sagging.
3. Color: As selected.
4. Movement Capability: 2 to 5 percent.
5. Service Temperature Range: 2 to 160 deg. F.
6. Hardness Range: Shore A, 15 to 40.

B. Acrylic Sealant:

1. Comply with ASTM C920, Grade NS, Class 12-1/2, Uses NT, M, A, and O.
2. Type: Single-component; solvent release curing; non-staining, non-bleeding, non-sagging.
3. Color: As selected.
4. Movement Capability: Plus and minus 12-1/2 percent.
5. Service Temperature Range: Minus 13 to plus 180 deg. F.
6. Hardness Range: Shore A, 25 to 50.

C. Butyl Sealant:

1. Comply with ASTM C920, Grade NS, Class 12-1/2, Use NT.
2. Type: Single-component; solvent release curing; non-skinning, non-sagging.
3. Color: As selected.
4. Movement Capability: Plus and minus 12-1/2 percent.
5. Service Temperature Range: Minus13 to plus 180 deg. F.
6. Hardness Range: Shore A, 10 to 30.

D. Non-sag Polyurethane Sealant:

1. Comply with ASTM C920, Grade NS, Class 25, Uses NT and M.
2. Type: Single-component; chemical curing; non-staining, non-bleeding, non-sagging; capable of continuous water immersion.

3. Color: As selected.
4. Movement Capability: Plus and minus 25 percent.
5. Service Temperature Range: Minus 40 to plus 180 deg. F.
6. Hardness Range: Shore A, 20 to 35.

E. Self-Leveling Polyurethane Sealant:

1. Comply with ASTM C920, Grade P, Class 25, Uses T, M, and A.
2. Type: Single-component; chemical curing; non-staining, non-bleeding; capable of continuous water immersion; self-leveling.
3. Color: As selected.
4. Movement Capability: Plus and minus 25 percent.
5. Service Temperature Range: Minus 40 to plus 180 deg. F.
6. Hardness Range: Shore A, 20 to 35.

F. Silicone Sealant:

1. Comply with ASTM C920, Grade NS, Class 25, Uses NT and A.
2. Type: Single-component; chemical curing; non-sagging, non-staining, non-bleeding ; fungus resistant.
3. Color: As selected.
4. Movement Capability: Plus 50 percent, minus 25 percent.
5. Service Temperature Range: Minus 65 to plus 180 deg. F.
6. Hardness Range: Shore A, 15 to 35.

2.4 ACCESSORIES

A. Primer:

1. Type: Non-staining.
2. As recommended by sealant manufacturer to suit application.

B. Joint Cleaner:

1. Type: Non-corrosive and non-staining.
2. As recommended by sealant manufacturer.
3. Compatible with joint forming materials.

C. Joint Backing:

1. Description: Round foam rod, compatible with sealant.
2. Comply with ASTM D1667, closed-cell PVC.
3. Size: Oversized 30 to 50 percent larger than joint width.

D. Bond Breaker:

1. Description: Pressure-sensitive tape.
2. As recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for application examination.

B. Verify that substrate surfaces and joint openings are ready to receive Work of this Section.

C. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for application preparation.

B. Comply with ASTM C1193.

C. Remove loose materials and foreign matter that could impair adhesion of sealant.

D. Clean and prime joints.

E. Protect elements surrounding Work of this Section from damage or disfiguration.

3.3 APPLICATION

A. Comply with ASTM C1193.

B. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.

C. Install bond breaker where joint backing is not used.

D. Apply sealant free of air pockets, foreign embedded matter, ridges, and sags.

E. Joint Tooling: Concave.

F. Precompressed Foam Sealant:

1. Do not stretch.
2. Avoid joints except at corners, ends, and intersections.
3. Apply with face 1/8 to 1/4 inch below adjoining surface.

G. Compression Gaskets:

1. Avoid joints except at ends, corners, and intersections.
2. Seal joints with adhesive.
3. Install with face 1/8 to 1/4 inch below adjoining surface.

3.4 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

B. Clean adjacent soiled surfaces.

3.5 PROTECTION

A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Protect sealants until cured.

3.6 SCHEDULE

A. Exterior Joints for Which No Other Sealant Type is Indicated: Type I.

B. Control and Expansion Joints in Paving: Type 2.

C. Exterior-Wall Expansion Joints: Type I.

D. Control, Expansion, and Soft Joints in Masonry and between Masonry and Adjacent Work: Type I.

E. Lap Joints in Exterior Sheet Metal Work: Type I.

F. Joints between Exterior Metal Frames and Adjacent Work (Except Masonry): Type I.

G. Under Exterior Door Thresholds: Type I.

H. Control and Expansion Joints in Interior Concrete Slabs and Floors: Type 2.

END OF SECTION 079000

DIVISION 08

OPENINGS

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite and transom frames.
3. Louvers installed in hollow metal doors.
4. Light frames and glazing installed in hollow metal doors.

B. Related Sections:
1. Division 01 Section "General Conditions".
2. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
3. Division 08 Section "Door Hardware".
4. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ANSI/SDI A250.13 - Testing and Rating of Severe Windstorm Resistant Components for Swing Door Assemblies.
7. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
8. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
9. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
10. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
11. ASTM E1886 - Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials.
12. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes.
13. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
14. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors

and Frames.

15. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
16. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
17. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
18. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
19. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.

B. Maintenance manual must be provided for tornado/hurricane storm shelter impact protective systems.

C. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.

D. Shop Drawings: Include the following:
   1. Elevations of each door design.
   2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
   3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
   4. Locations of reinforcement and preparations for hardware.
   5. Details of anchorages, joints, field splices, and connections.
   6. Details of accessories.
   7. Details of moldings, removable stops, and glazing.
   8. Details of conduit and preparations for power, signal, and control systems.

E. Samples for Verification:
   1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

F. Informational Submittals:
   1. Hurricane Resistant Openings (State of Florida): Within the State of Florida, provide copy of current State of Florida Product Approval as proof of compliance that doors, frames and hardware for exterior opening assemblies have been tested and approved for use at the design pressure level and debris impact resistance requirements specified for the Project.
      a. Hurricane Resistant Components (State of Florida): Within the State of Florida, provide copy of independent, third-party certified listing conforming to ANSI A250.13.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40" above sill) or UL 10C.
   1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
   2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
   3. Smoke Control Door Assemblies: Comply with NFPA 105.
      a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.

D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.

E. Hurricane Resistant Exterior Openings: Provide exterior hollow metal doors and frames as complete and tested assemblies, or component assemblies, including approved hardware specified under Section 087100 "Door Hardware", to meet the design pressures, debris impact resistance, and glass and glazing requirements applicable to the Project.
   1. Test units according to ASTM E330, ASTM E1886, ASTM E1996M TAS 201, TAS 202 and TAS 203 standards, certified by a qualified independent third party agency acceptable to authority having jurisdiction, and bearing a third party certification agency permanent label indicting windstorm approved product.

F. Storm Shelter Openings: Provide complete door systems for hurricane or tornado storm shelters, and other areas of refuge, complying and tested according to ICC 500 (2014/2020), ICC/NSSA Standard for the Design and Construction of Storm Shelters.
   1. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

G. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
   1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.6 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Building Information Modeling (BIM) Support: Utilize designated BIM software tools and obtain training needed to successfully participate in the Project BIM processes. All technical disciplines are responsible for the product data integration and data reliability of their Work into the coordinated BIM applications.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:
   1. CECO Door Products (C).
   2. Curries Company (CU).
   3. Steelcraft (S).

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.

B. Exterior Doors: Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
1. Design: Flush panel.
2. Core Construction: Manufacturer's standard vertical steel-stiffener core. Minimum 22 gauge steel-stiffeners at 6 inches on-center construction attached by spot welds spaced not more than 5" on centers. Spaces between stiffeners filled with fiberglass insulation (minimum density 0.8#/cubic ft.).
3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.
4. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
6. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

C. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
1. Design: Flush panel.
   a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
2. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.
3. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
4. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
5. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with

reinforcing plates from same material as door face sheets.

D. Manufacturers Basis of Design:
   1. Curries Company (CU) - Polystyrene Core - 707 Series.
   2. Curries Company (CU) - Steel-Stiffened - 747 Series.

2.4 SPECIAL FUNCTION HOLLOW METAL DOORS

2.5 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.
   1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
   2. Frames: Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.
   3. Manufacturers Basis of Design:
      a. Curries Company (CU) – M Series.

C. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
   1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
   2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
   3. Manufacturers Basis of Design:
   a. Curries Company (CU) - M Series.

D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

E. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.6 FRAME ANCHORS

A. Jamb Anchors:
   1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
   2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
   3. Hurricane Opening Anchors: Types as tested and required for indicated wall types to meet specified design pressure and impact rating criteria.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.7 LOUVERS

A. Metal Louvers: Unless otherwise indicated provide louvers to meet the following requirements.
   1. Blade Type: Vision proof inverted V or inverted Y.
   2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

B. Louvers for Fire Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire protection rating of 1-1/2 hours and less.
   1. Manufacturers: Subject to compliance with requirements, provide louvers to meet rating indicated.
   2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

2.8 LIGHT OPENINGS AND GLAZING

A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.

B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.

C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.

D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.9 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.10 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Doors:

1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

D. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
    a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
9. Jamb Anchors: Provide number and spacing of anchors as follows:
    a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
        1) Two anchors per jamb up to 60 inches high.
        2) Three anchors per jamb from 60 to 90 inches high.
        3) Four anchors per jamb from 90 to 120 inches high.
        4) Four anchors per jamb plus 1 additional anchor per jamb for

each 24 inches or fraction thereof above 120 inches high.

b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
   1) Three anchors per jamb up to 60 inches high.
   2) Four anchors per jamb from 60 to 90 inches high.
   3) Five anchors per jamb from 90 to 96 inches high.
   4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
   5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.

c. Storm Shelter Openings: Provide jamb, head, and sill anchors in accordance with manufacturer's certified assembly listings.

10. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
11. Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
   1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
   2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
   3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
   4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.11 STEEL FINISHES

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
   1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

E. Verify tolerances against manufacturers installations instructions for tornado and hurricane storm shelter openings.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
   1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
   2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
   3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
   4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
   1. Non-Fire-Rated Standard Steel Doors:

a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

3.5 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

END OF SECTION 081113

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes interior and exterior aluminum-framed storefronts including aluminum and glass doors and frames including hardware.
   1. Exterior storefronts to be large and small missile impact rated.

B. Related Sections:
   1. Section 079000 - Joint Protection: System perimeter sealant and back-up materials.
   2. Section 084413 - Glazed Aluminum Curtain Walls.
   3. Section 087100 - Door Hardware: Mortised hardware reinforcement requirements affecting framing members; hardware items other than specified in this section.
   4. Section 088000 - Glazing.

1.2 REFERENCES

A. Aluminum Association:
   1. AA ADM 1 - Aluminum Design Manual.

B. American Architectural Manufacturers Association/Window & Door Manufacturers Association:
   1. AAMA/WDMA 101/I.S.2 - Specification for Windows, Doors and Unit Skylights.
   2. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Glass Doors.
   3. AAMA 503 - Voluntary Specification for Field Testing of Metal Storefronts. Curtain Wall and Sloped Glazing Systems.
   4. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
   5. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
   6. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
   7. AAMA 2604 - Voluntary specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
   8. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
   9. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site.
   10. AAMA MCWM-1 - Metal Curtain Wall Manual.
   11. AAMA SFM-1 - Aluminum Store Front and Entrance Manual.

C. American Society of Civil Engineers:
   1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

D. ASTM International:
   1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
   2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

3. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
4. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
5. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
6. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
7. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
8. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
9. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
10. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Differential.
11. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Curtain Walls, and Doors by Uniform or Cyclic Static Air Pressure Difference.
12. ASTM E1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
13. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

E. California Department of Health Services:
1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.

F. Green Seal:
1. GC-03-2nd Edition, January 7, 1997 - Anti-Corrosive Paints.

G. National Fenestration Rating Council Incorporated:
1. NFRC 100 - Procedures for Determining Fenestration Product U-Factors.

H. SSPC: The Society for Protective Coatings:
1. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).
2. SSPC Paint 25 - Red Iron Oxide, Zinc Oxide, Raw Linseed Oil, and Alkyd Primer.

1.3 SYSTEM DESCRIPTION

A. Aluminum-framed storefront system includes tubular aluminum sections with supplementary internal support framing, aluminum and glass entrances, shop fabricated, factory finished, glass and glazing, infill, related flashings, anchorage and attachment devices. Exterior system shall be thermally broken.

B. System Assembly: Site assembled.

C. Exterior system shall be large and small impact rated as required by code and Section 1.4 Performance Requirements items “A” and “B”; and meet all the requirements of ASTM missile level “E” rating.

1.4 PERFORMANCE REQUIREMENTS

A. System Design: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall, including building corners.
   1. As calculated in accordance with applicable code, as tested in accordance with ASTM E330.

B. Wind-Borne Debris Loads (133 mph zone): Design and size glass to withstand the following loads:
   1. Missile level E impact protection:
      - Glass Within 30 feet of Grade: ASTM E1886 and ASTM E1996; large missile impact test.
      - Glass Greater than 30 feet above Grade: ASTM E1886 and ASTM E1996; small missile impact test.

C. Deflection: Limit mullion deflection to 1/175 for spans under 13’-6” and 1/240 plus 1/4 inch for spans over 13’-6” flexure limit of glass 3/4 inch of span; with full recovery of glazing materials.

D. System Assembly: Accommodate without damage to components or deterioration of seals, movement within system, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.

E. Air Infiltration: Limit air leakage through assembly to 0.06 cfm/min/sq ft of wall area, measured at reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E283.

F. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

G. Water Leakage: None, when measured in accordance with AAMA/WDMA 101/I.S.2, ASTM E331,ASTM E547 with test pressure difference of 20 percent of design pressure, with minimum differential of 2.86 lbf/sq ft and maximum of 12.00 lbf/sq ft.

H. Thermal and Solar Heat Transmittance of Assembly (U Value and SHGC): Comply with ICC IEEC for climate zone in which project is located.

I. Exterior system to be thermally broken.

J. Expansion / Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over 12 hour period without causing detrimental effect to system components and anchorage.

K. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior by weep drainage network.

L. 100 percent of exterior system will be tested. See Quality Control.

1.5 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work and expansion and contraction joint location and details.

C. Product Data: Submit component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.

D. Samples: Submit two samples 12 x 12 inches in size illustrating finished aluminum surface.

E. Design Data: Indicate framing member structural and physical characteristics, calculations, dimensional limitations.

F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with AAMA SFM-1 and AAMA MCWM-1 - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.

B. Surface Burning Characteristics:
   1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

C. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation board.

1.7 QUALIFICATIONS

A. Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with documented experience.

B. Design structural support framing components under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.

1.8 PRE-INSTALLATION MEETINGS

A. Section 013000 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

1.9 DELIVERY, STORAGE, AND PROTECTION

A. Section 016000 - Product Requirements: Product storage and handling requirements.

B. Handle Products of this section in accordance with AAMA MCWM-1 - Curtain Wall Manual #10.

C. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Section 016000 - Product Requirements.

B. Do not install sealants nor glazing materials when ambient temperature is less than 40 degrees F during and 48 hours after installation.

1.11 COORDINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Coordinate the Work with installation of firestopping, air barrier, and automatic entrance doors components or materials.

1.12 WARRANTY

A. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.

B. Furnish five year manufacturer warranty for glazed units.

PART 2 PRODUCTS

2.1 ALUMINUM-FRAMED STOREFRONTS

A. Manufacturers:
   1. Exterior Storefront
      a. Kawneer:
         1) Frame: IR501 T 5” x 2-3/4”
         2) Door: 500 Heavy Wall IR
      b. EFCO
      c. Oldcastle
      d. YKK Architectural Products – YKK YHS 50 TU
      e. United States Aluminum Series IT600
      f. Substitutions: Section 016000 - Product Requirements.

   2. Interior Storefront
      a. Kawneer: TriFab 450
      b. EFCO
      c. Oldcastle
      d. YKK Architectural Products: YKK 45 FS
      e. Substitutions: Section 016000 – Product Requirements.
   3. Interior Storefront door
      a. Kawneer: Wide Stile 350
      b. EFCO
      c. Substitutions: Section 016000 – Product Requirements.

B. Product Description:
   1. Aluminum Frame: Thermally broken; flush glazing stops; drainage holes; internal weep drainage system. Frames for interior glazing need not to be thermally broken.
   2. Mullions: Profile of extruded sheet aluminum cladding with internal reinforcement of aluminum or shaped steel structural section.
   3. Doors: Aluminum framed glass doors; 1-3/4 inches thick, nominal 2 inch wide top rail and vertical stiles, nominal 6 inch wide bottom rail; square glazing stops.
   4. System to be large and small missile impact rated.
   5. Extensions: Sill, jamb, and head extensions at all exterior windows. At select interior windows as shown on drawings.

C. All products are to be furnished and supplied by one (1) manufacturer with single source responsibility. Shop drawings and calculations are to be prepared by the manufacturer, not the installer."

2.2 COMPONENTS

A. Extruded Aluminum: ASTM B221; 6063 alloy, T5 temper typical, 6061 alloy, T6 temper for extruded structural members.

B. Sheet Aluminum: ASTM B209, 5005 alloy, H15 or H34 temper.

C. Sheet Steel: ASTM A653/A653M; galvanized to minimum G90 coating class.

D. Steel Sections: ASTM A36/A36M; shaped to suit mullion sections, galvanized.

E. Glass: Specified in Section 088000.

F. Glazing Materials: As specified in Section 088000.

G. Hardware: as specified in Section 087100.

H. Sill Flashings: Minimum 0.063 inch thick aluminum with end dams to match mullion sections. Set in full bed of sealant.

I. Firestopping: Specified in Section 078400.

J. Air Barrier: Specified in Section 072700.

K. Sealant and Backing Materials:
   1. Perimeter Sealant: Specified in Section 079000.

L. Fasteners: Stainless steel.

2.3 FABRICATION

A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

C. Prepare components to receive anchor devices. Fabricate anchors.

D. Arrange fasteners and attachments to conceal from view.

E. Reinforce interior horizontal head rail to receive blind track brackets and attachments.

F. Prepare components with internal reinforcement for door hardware.

G. Reinforce framing members for imposed loads.

2.4 SHOP FINISHING

A. Clear Anodized Aluminum Surfaces: AAMA 611, AA-M12C22A41 non-specular as fabricated mechanical finish, medium matte chemical finish, and Architectural Class I 0.7 mils clear anodized coating.

B. Concealed Steel Items: Galvanized to ASTM A123/A123M; minimum 2.0 oz/sq ft coating thickness; galvanize after fabrication.

C. Apply bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar metals.

D. Shop Primer for Steel Components: SSPC Paint 25 red oxide.

E. Touch-Up Primer for Galvanized Steel Surfaces: SSPC Paint 20 zinc rich.

F. Extent of Finish:
   1. Apply factory coating to surfaces exposed at completed assemblies.
   2. Apply finish to surfaces cut during fabrication so no natural aluminum is visible in completed assemblies, including joint edges.
   3. Apply touch-up materials recommended by coating manufacturer for field application to cut ends and minor damage to factory applied finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Verify dimensions, tolerances, and method of attachment with other Work.

C. Verify wall openings and adjoining air and vapor seal materials are ready to receive Work of this Section.

3.2 INSTALLATION

A. Install wall system in accordance with AAMA MCWM-1 - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent Work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent Work to form water tight dam. Set in full bed of sealant.

G. Coordinate attachment and seal of perimeter air and vapor retarder materials.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Install integral flashings and integral joint sealers.

J. Set thresholds in bed of mastic and secure.

K. Install hardware using templates provided. Refer to Section 08 71 00 for installation requirements.

L. Install infill panels using method required to achieve performance criteria.

M. Coordinate installation of glass with Section 08 80 00 ; separate glass from metal surfaces.

N. Coordinate installation of perimeter sealants with Section 07 90 00.

3.3 ERECTION TOLERANCES

A. Section 014000 - Quality Requirements: Tolerances.

B. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.

C. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.4 FIELD QUALITY CONTROL

A. Section 014000 - Quality Requirements and 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspection to monitor quality of installation and glazing.

C. Test to AAMA 502 or 503 and ASTM E1105.

3.5 ADJUSTING

A. Section 017000 - Execution and Closeout Requirements: Testing, adjusting and balancing.

3.6 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Final cleaning.

B. Remove protective material from pre-finished aluminum surfaces.

C. Wash down surfaces with solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

D. Remove excess sealant by method acceptable to sealant manufacturer.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 017000 - Execution and Closeout Requirements: Protecting installed construction.

B. Protect finished Work from damage.

END OF SECTION 084113

SECTION 084413 - GLAZED ALUMINUM CURTAIN WALLS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes aluminum tube frame glazed curtain wall system.
   1. Large and small missile impact rated.

B. Related Sections:
   1. Section 05 12 00 - Structural Steel Framing: Steel fabricated attachment members.
   2. Section 07 84 00 - Firestopping: at locations other than curtain wall to floor slabs.
   3. Section 07 90 00 - Joint Protection: Joint sealers other than those integral with curtain wall.
   4. Section 08 41 13 - Aluminum-Framed Entrances and Storefronts: Storefront systems including entrance doors, frames, and glazed lights.
   5. Section 08 71 00 - Door Hardware: Hardware reinforcement requirements affecting curtain wall framing members.
   6. Section 08 80 00 - Glazing: Glass and glazing not integral with curtain wall system.

1.2 REFERENCES

A. Aluminum Association:
   1. AA DAF-45 - Designation System for Aluminum Finishes.

B. American Architectural Manufacturers Association:
   1. AAMA/WDMA 101/I.S.2 - Specifications for Windows, Doors, and Unit Skylights.
   2. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Glass Doors.
   3. AAMA 503 - Voluntary Specification for Field Testing of Metal Storefronts. Curtain Wall and Sloped Glazing Systems.
   4. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
   5. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
   6. AAMA 1801 - Voluntary Specification for the Acoustical Rating of Windows, Doors and Glazed Wall Sections.
   7. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
   8. AAMA 2604 - Voluntary specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
   9. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
   10. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site.
   11. AAMA CW-11 - Design Windloads for Buildings and Boundary Layer Wind Tunnel Testing.
   12. AAMA CW-DG-1 - Aluminum Curtain Wall Design Guide Manual.
   13. AAMA MCWM-1 - Metal Curtain Wall Manual.
   14. AAMA SFM-1 - Aluminum Store Front and Entrance Manual.

C. American Society of Civil Engineers:
   1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

D. ASTM International:
   1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
   2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   3. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   4. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
   5. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
   6. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
   7. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
   8. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
   9. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
   10. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Curtain Walls, and Doors by uniform or Cyclic Static Air Pressure Difference.
   11. ASTM E1425 - Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems.
   12. ASTM E1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
   13. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

E. California Department of Health Services:
   1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.

F. National Fenestration Rating Council Incorporated:
   1. NFRC 100 - Procedures for Determining Fenestration Product U-Factors.

G. South Coast Air Quality Management District:
   1. SCAQMD Rule 1168-January 7, 2005 - Adhesive and Sealant Applications.

H. SSPC: The Society for Protective Coatings:
   1. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).
   2. SSPC Paint 25 - Red Iron Oxide, Zinc Oxide, Raw Linseed Oil, and Alkyd Primer.

1.3 SYSTEM DESCRIPTION

A. Curtain Wall System: Tubular aluminum sections with self supporting framing, factory prefinished, glass and glazing, and louvers; related joint sealers, flashings, anchorage and attachment devices.
   1. System to be reglazable from exterior.
   2. System to be thermally broken.

B. System Assembly: Site assembled.

C. System shall be large and small missile impact rated as required by code and Section 1.4 Performance Requirements items “A” and “B”..

1.4 PERFORMANCE REQUIREMENTS

A. Wind Loads (133 mph wind zone): Design and size components to withstand dead loads and live loads caused by positive and negative wind loads acting normal to plane of wall, including building corners.
   1. As calculated in accordance with ASCE 7 - Calculation of Wind Loads, as measured in accordance with AAMA CW-11 ASTM E330.

B. Wind-Borne Debris Loads: Design and size glass located less than 60 feet above grade to withstand the following loads:
   1. Missile Level E impact protection
      - Glass Within 30 feet of Grade: ASTM E1886 and ASTM E1996; large missile impact test.
      - Glass Greater than 30 feet above Grade: ASTM E1886 and ASTM E1996; small missile impact test.

C. Deflection: Limit mullion deflection to 1/175 for panes under 13’-6” and 1/240 plus 1/4” for spans over 13’-6” 1/175 flexure limit of glass with full recovery of glazing materials.

D. System Assembly: Accommodate following without damage to system, components or deterioration of seals.
   1. Movement within system.
   2. Movement between system and perimeter framing components.
   3. Dynamic loading and release of loads.
   4. Deflection of structural support framing.
   5. Tolerance of supporting components.

E. Thermal and Solar Heat Transmittance of Assembly (U Value and SHGC): Comply with ICC IEEC for climate zone in which project is located.

F. Sound Attenuation Through Wall System (Exterior to Interior): OITC (Outside/Inside Transmission Class) 32, measured in accordance with AAMA 1801 and ASTM E1425.

G. Air Infiltration: Limit air infiltration through assembly to 0.06 cfm/min/sq ft of wall area, measured at reference differential pressure across assembly of 6.24 psf as measured in accordance with AAMA/WDMA 101/I.S.2. ASTM E283.

H. Water Leakage: None, when measured in accordance with AAMA/WDMA 101/I.S.2 ASTM

E331 with test pressure difference of 20 percent of design pressure, with minimum differential of 2.86 lbf/sq ft and maximum of 12.00 lbf/sq ft.

I. Expansion / Contraction: System to provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over 12 hour period without causing detrimental affect to system components.

J. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior by weep drainage network.

K. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound. Position thermal insulation on exterior surface of air barrier and vapor retarder.

L. Not Permitted: Vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system.

M. 100 percent of system will be tested: Re: Quality Control.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, anticipated deflection under load, affected related work, weep drainage network, expansion and contraction joint location and details, and field welding required.
   1. Include shop and field sealants by manufacture and product name, and locate on drawings. Show sealant joint sizes, including tolerances and maximum/minimum joint sizes required.

C. Product Data: Submit component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details and water flow drainage diagrams.

D. Samples: Submit two 12 x 12 inches in size indicating prefinished aluminum surface.

E. Design Data: Indicate framing member structural and physical characteristics, calculations, dimensional limitations.

F. Test Reports: Indicate substantiating engineering data, test results of previous tests by independent laboratory which purport to meet performance criteria, and other supportive data.

G. Manufacturer’s Certificate: Certify products meet or exceed specified requirements.

H. Installation Data: Special installation requirements.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with AAMA CW-DG-1 - Aluminum Curtain Wall Design Guide Manual.

B. Surface Burning Characteristics:
   1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

C. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation board.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with documented experience.

B. Installer: Company specializing in performing Work of this section with documented experience approved by manufacturer.

C. Design structural support framing components under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.

1.8 MOCKUP

A. Section 01 40 00 - Quality Requirements: Requirements for mockup.

B. Construct mockup, curtainwallwith surrounding finishes, mockup including intermediate mullion, sill muntin, vision glass light, and infill glass. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.

C. Locate where directed by Architect/Engineer.

D. Remove mockup when directed by Architect/Engineer.

1.9 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

1.10 DELIVERY, STORAGE, AND PROTECTION

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Handle Work of this Section in accordance with AAMA MCWM-1 - Curtain Wall Manual.

C. Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather. Puncture wrappings at ends for ventilation.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. Do not install sealants when ambient temperature is less than 40 degrees F during and 48 hours after installation.

1.12 COORDINATION

A. Coordinate Work under provisions of Section 01 30 00.

1.13 WARRANTY

A. Section 01 70 00 - Execution and Closeout Requirements: Product warranties and product bonds.

B. Furnish five year manufacturer warranty for glass.

PART 2 PRODUCTS

2.1 GLAZED ALUMINUM CURTAIN WALLS

A. Manufacturers:
   1. Kawneer: 1600 IR, size as required.
   2. Oldcastle
   3. EFCO
   4. YKK Architectural Products – YKK YHC 300 OG
   5. United States Aluminum Series IW3250
   6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: Glazed aluminum curtain wall, thermally broken with interior tubular section insulated from exterior glass retaining member; matching stops and glass retaining member of sufficient size and strength to provide bite on glass and infill panels; drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system; internal mullion baffles to eliminate "stack effect" air movement within internal spaces.
   1. Reinforced Mullion: Extruded aluminum cladding with internal reinforcement of shaped steel structural section.
   2. System shall be large and small missile impact rated.
   3. Sill, jamb and head extensions at all exterior windows.

C. All products are to be furnished and supplied by one (1) manufacturer with single source responsibility. Shop drawings and calculations are to be prepared by the manufacturer, not the installer

2.2 COMPONENTS

A. Extruded Aluminum: ASTM B221; 6063 alloy, T5 temper typical, 6061 alloy, T6 temper for extruded structural members.

B. Sheet Aluminum: ASTM B209, 3003 or 5005 alloy, H15, H16, or H34 temper.

C. Sheet Steel: ASTM A653/A653M; galvanized to minimum G90 coating class.

D. Steel Sections: ASTM A36/A36M; shaped to suit mullion sections, galvanized.

E. Glass: Specified in Section 08 80 00.

F. Glazing Materials: As specified in Section 08 80 00.

G. Sealant and Backing Materials: Furnish sealants and backing materials complying with requirements specified in Section 07 90 00 of Types described below.
   1. Perimeter Sealants: Silicone.
   2. Sealant Used within System (Not Used for Glazing): Manufacturer's standard types for specific applications.

H. Flashings: Minimum 0.063 inch thick aluminum to match curtain wall mullion sections where exposed.
   1. Secure flashings with concealed fastening method.

I. Firestopping: Specified in Section 07 84 00.

J. Air Barrier: Specified in Section 07 27 00.

K. Fasteners: Stainless steel.

L. Sill Flashing: 0.063 inch thick aluminum set in full bed of sealant with end dams.

M. Sunshade: Kawneer, 30" deep missile impact rated sunshade consisting of the following:
   1. 162003 Mullion
   2. 162517 Pressure Plate
   3. 162187 Cover
   4. 162571 Cover Sleeve
   5. 162378 Shear Block
   6. 494007 Planar (Tubular) Blade
   7. 494370 OR 30" SQ Jamb
   8. 482232 Rectangular Trim Filler (Jamb)
   9. 482064 FS – Rectangular 500X250 Int
   10. 494250 OR 30" SQ Int Lg

2.3 FABRICATION

A. Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

C. Prepare components to receive anchor devices. Fabricate anchors.

D. Arrange fasteners and attachments to conceal from view.

E. Reinforce interior horizontal head rail to receive blind track brackets and attachments.

F. Reinforce framing members for external imposed loads.

2.4 SHOP FINISHING

A. Clear Anodized Aluminum Surfaces: AA-M12C22A41 non-specular as fabricated mechanical finish, medium matte chemical finish, and Architectural Class I 0.7 mils clear anodized coating.
   1. Conform to AAMA 611.

B. Concealed Steel Items: Galvanized to ASTM A123/A123M; minimum 2.0 oz/sq ft coating thickness; galvanize after fabrication.

C. Apply bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

D. Shop and Touch-Up Primer for Steel Components: SSPC Paint 25 red oxide.

E. Touch-Up Primer for Galvanized Steel Surfaces: SSPC Paint 20 zinc rich.

F. Extent of Finish:
   1. Apply factory coating to surfaces exposed at completed assemblies.
   2. Apply finish to surfaces cut during fabrication so no natural aluminum is visible in completed assemblies, including joint edges.
   3. Apply touch-up materials recommended by coating manufacturer for field application to cut ends and minor damage to factory applied finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify dimensions, tolerances, and method of attachment with other work.

C. Verify wall openings and adjoining air barrier and vapor retarder materials are ready to receive Work of this section.

3.2 INSTALLATION

A. Install wall system in accordance with AAMA MCWM-1 - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent Work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent Work to form water tight dam. Set in full bed of sealant.

G. Install firestopping at each floor slab edge. Comply with applicable codes and requirements specified in Section 07 84 00.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Install glass to achieve performance criteria conforming with installation requirements specified in Section 08 80 00.

J. Install louvers, associated flashings, blank-off plates and screening. Fit blank-off plates tight to ductwork.

K. Install perimeter sealant to method required to achieve performance criteria conforming with installation criteria specified in Section 07 90 00.

L. Coordinate attachment and seal of perimeter air barrier and vapor retarder materials.

M. Coordinate installation of operating sash with Section 08 51 13.

3.3 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.

C. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

D. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch and minimum of 1/4 inch.

3.4 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements, 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspection to monitor quality of installation and glazing.

C. Perform field water test in compliance with ASTM E1105, on completed portions of curtain wall.

D. Perform one test each at 10%, 50% and 80% of curtain wall completion, with repeat tests when failures occur.

E. When testing results in leakage, eliminate causes of leaks and retest until no leaks occur.

3.5 MANUFACTURER'S FIELD SERVICES

A. Section 01 40 00 - Quality Requirements: Manufacturers' field services.

B. Curtain wall and glass product manufacturers to provide field surveillance of installation of their Products.

C. Monitor and report installation procedures and unacceptable conditions.

3.6 ADJUSTING

A. Section 01 70 00 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

B. Adjust operating sash for smooth operation.

3.7 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.

B. Remove protective material from prefinished aluminum surfaces.

C. Wash down surfaces with solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

D. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

3.8 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting installed construction.

B. Protect finished Work from damage.

END OF SECTION 084413

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Sliding doors.
3. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Automatic operators.
4. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.
2. Division 08 Section “Flush Wood Doors”.
3. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.
4. Division 08 Section “All-Glass Entrances”.
5. Division 08 Section “Automatic Door Operators”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
8. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.
    h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
b. Complete (risers, point-to-point) access control system block wiring diagrams.
c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

A. Hardware Supplier and Hardware Installer must obtain a license with the Louisiana Office of State Fire Marshall in accordance to RS 40:1464 and RS 40:1664.

B. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

C. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

D. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

E. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity.

F. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

G. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

H. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

I. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

J. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 CONTINUOUS HINGES

A. Pin and Barrel Continuous Hinges: ANSI/BHMA A156.26 Grade 1-600 pin and barrel continuous hinges with minimum 14 gauge Type 304 stainless steel hinge leaves, concealed stainless pin, and twin self-lubricated nylon bearings at each knuckle separation. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:

    a. Hager Companies (HA).
    b. Markar Products; ASSA ABLOY Architectural Door Accessories (MR).
    c. Pemko (PE).

2.3 FLOOR CLOSERS AND PIVOTS

A. Pivots: ANSI/BHMA A156.4, Grade 1; space intermediate pivots equally not less than 25 inches on center apart or not more than 35 inches on center for doors over 121 inches high. Pivot hinges to have oil impregnated bronze bearing in the top pivot and a radial roller and thrust bearing in the bottom pivot with the bottom pivot designed to carry the full weight of the door. Pivots to be UL listed for windstorm where applicable.

1. Manufacturers:

    a. Architectural Builders Hardware (AH).
    b. Norton Rixson (RF).

2.4 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
5. Manufacturers:

    a. Rockwood (RO).
    b. Trimco (TC).

B. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Pulls, where applicable, shall be provided with a 10” clearance from the finished floor on the push side to accommodate wheelchair accessibility.
5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
6. Manufacturers:

    a. Rockwood (RO).
    b. Trimco (TC).

2.5 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Match Facility Standard.

C. Large Format Interchangeable Cores: Provide removable cores (LFIC) as specified, core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware.

D. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Field verify and key cylinders to match Owner's existing system.

E. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)

2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).
4. Construction Control Keys (where required): Two (2).
5. Permanent Control Keys (where required): Two (2).

F. Construction Keying: Provide temporary keyed construction cores.

G. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 KEY CONTROL

A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Manufacturers:

a. Lund Equipment (LU).
b. MMF Industries (MM).
c. Telkee (TK).

2.7 MORTISE LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): Provide ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed mortise locksets. Listed manufacturers shall meet all features and functionality as specified herein.

1. Manufacturers:

a. Corbin Russwin Hardware (RU) - ML2000 Series.
b. Sargent Manufacturing (SA) - 8200 Series.
c. Schlage (SC) - L9000 Series.

2.8 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.

4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.9 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. Exit devices shall have a five-year warranty.
2. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.
4. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

    a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.
9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:

    a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
    b. Sargent Manufacturing (SA) - 80 Series.
    c. Von Duprin (VD) - 35A/98 XP Series.

2.10 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard..

1. Manufacturers:

    a. Corbin Russwin Hardware (RU) - DC6000 Series.
    b. LCN Closers (LC) - 4040 Series.
    c. Sargent Manufacturing (SA) - 351 Series.

2.11 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width

and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:

    a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:

    a. Rockwood (RO).
    b. Trimco (TC).

2.12 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

    a. Rockwood (RO).
    b. Trimco (TC).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

    a. Norton Rixson (RF).
    b. Rockwood (RO).
    c. Sargent Manufacturing (SA).

2.13 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and

provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. National Guard Products (NG).
2. Pemko (PE).

2.14 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.15 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing and sizing all products.
3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Manufacturer's Abbreviations:

1. MK - McKinney
2. MR - Markar
3. RF - Rixson
4. RO - Rockwood
5. RU - Corbin Russwin
6. HS - HES
7. NO - Norton
8. PE - Pemko
9. OT - Other
10. SU - Securitron

Hardware Sets based on plans

Set: 1.0
Doors: 106A, 106B, 107, 108, 202, 302, 305, 402
Description: Exterior, HM 3'-0" 1-1/34"; PNL-F-HM, F-00-HM02

1	Continuous Hinge	HG305	630	MR
1	Storeroom Lock	ML2057 LWA CT*D	630	RU
1	Perm Core	LFIC - Match Existing		RU
1	Surface Closer	DC6200 A4	689	RU
1	Kick Plates	K1050 10" CSK BEV	US32D	RO (both sides)
2	Sweep	315CN		PE
1	Threshold	2005AT		PE

Set: 2.0
Doors: 106C
Description: Exterior, HM 3'-0" x 4'-6" 1-3/4"; PNL-F-HM, F-00-HM02

1	Continuous Hinge	HG305	630	MR
1	Storeroom Lock	ML2057 LWA CT*D	630	RU
1	Perm Core	LFIC - Match Existing		RU
1	Surface Closer	DC6200 A4	689	RU
1	Kick Platesa	K1050 10" CSK BEV	US32D	RO (both sides)
2	Sweep	315CN		PE
1	Threshold	2005AT		PE

Set: 3.0
Doors: 503, 504
Description: Exterior, HM 3'-0" x 7'-0"; PNL-FG-AL, F-00-AL00

1	Pivot Set	195	626	RF

1	Intermediate Pivot	M19	626	RF
1	Rim Exit Device, Nightlatch	ED5200 K157ET M92 MELR CT*D	630	RU
1	Perm Core	LFIC - Match Existing		RU
1	Door Pull	BF157	US32D	RO
1	Surface Closer - DA	DC6200 A4 M71	689	RU
1	Gasketing	By the door manufacturer		PE
1	Threshold	2005 AT		PE

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Glass and glazing for windows, and glazed walls.
   2. Glass and glazing for cabinet shelves and doors.
   3. Glass and glazing materials and installation requirements are included in this section for other sections referencing this section.

B. Related Sections:
   1. Section 07 90 01 - Joint Protection: Sealant and back-up material other than glazing sealants.
   2. Section 08 41 13 - Aluminum-Framed Entrances and Storefronts.
   3. Section 08 44 13 - Glazed Aluminum Curtain Walls.

1.2 REFERENCES

A. American National Standards Institute:
   1. ANSI Z97.1 - Safety Glazing Materials Used in Buildings Safety.

B. American Society of Civil Engineers:
   1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. ASTM International:
   1. ASTM C509 - Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.
   2. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
   3. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
   4. ASTM C1036 - Standard Specification for Flat Glass.
   5. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.
   6. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass.
   7. ASTM C1193 - Standard Guide for Use of Joint Sealants.
   8. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass.
   9. ASTM D635 - Standard Test Method for Rate of Burning [**and**] [**or**] Extent and Time of Burning of Plastics in a Horizontal Position.
   10. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics.
   11. ASTM D4802 - Standard Specification for Poly (Methyl Methacrylate) Acrylic Plastic Sheet.
   12. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
   13. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
   14. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

15. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings.
16. ASTM E1425 - Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems.
17. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
18. ASTM E1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
19. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

D. California Department of Health Services:
   1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.

E. Consumer Products Safety Commission:
   1. CPSC 16 CFR 1201 - Safety Standard for Architectural Glazing.

F. Glass Association of North America:
   1. GANA - Sealant Manual.
   2. GANA - Glazing Manual.
   3. GANA - Laminated Glass Design Guide.

G. National Fenestration Rating Council Incorporated:
   1. NFRC 100 - Procedures for Determining Fenestration Product U-Factors.
   2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.
   3. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems.

H. National Fire Protection Association:
   1. NFPA 80 - Standard for Fire Doors, Fire Windows.
   2. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
   3. NFPA 257 - Standard on Fire Test for Window and Glass Block Assemblies.

I. South Coast Air Quality Management District:
   1. SCAQMD Rule 1168-January 7, 2005 - Adhesive and Sealant Applications.

J. Underwriters Laboratories Inc.:
   1. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
   2. UL - Building Materials Directory.

1.3 PERFORMANCE REQUIREMENTS

A. Provide glass and glazing materials for continuity of building enclosure vapor retarder and air barrier:
   1. In conjunction with materials described in Section 07 26 00, 07 27 00, and 07 90 00.

2. To utilize inner pane of multiple pane sealed units for continuity of air barrier and vapor retarder seal.
3. To maintain continuous air barrier and vapor retarder throughout glazed assembly from glass pane to heel bead of glazing sealant.

B. All exterior glazing shall be large and small missile impact rated as required by code and Section 1.3 Performance Requirements items E and F.

C. Glass Thickness: Select minimum thickness in accordance with ASTM E1300 to resist specified design loads with the following maximum probability of breakage:
1. Vertical Glass: 8 lites per 1000 for wind loads with 60 seconds maximum load duration.
2. Sloped Glass: 1 lite per 1000 for wind and snow loads with 30 days maximum load duration.
3. Minimum Thickness: 1/4 inch for exterior glass.

D. Structural Design: Design in accordance with applicable code for most critical combination of wind, snow, seismic, and dead loads.

E. Wind Loads: Design and size glass to withstand positive and negative wind loads acting normal to plane of wall, including increased loads at building corners.
1. Design Wind Load: 133 mph as calculated in accordance with applicable code and ASCE 7.

F. Wind-Borne Debris Loads: Design and size glass to withstand the following loads:
1. Glass Within 30 feet of Grade: ASTM E1886 and ASTM E1996; large missile impact test.
2. Glass Greater than 30 feet above Grade: ASTM E1886 and ASTM E1996; small missile impact test.

G. Exterior Glass Deflection: Maximum of 1/175 of glass edge length or 3/4 inch, which ever is less with full recovery of glazing materials.

H. Interior Glass Deflection: Maximum differential deflection for two adjacent unsupported edges when 50 plf force is applied to one panel at any point up to 42 inches above finished floor less than thickness of glass.

I. Thermal and Solar Optical Performance: Measured or calculated in accordance with the following:
1. Maximum U-Values: Comply with ICC IEEC for climate zone in which project is located. Measure in accordance with AAMA 1503 and NFRC 100.
2. Maximum SHGC: Comply with ICC IEEC for climate zone in which project is located. Measure in accordance with NFRC 200.
3. Solar Optical Properties: NFRC 300.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Signed and sealed by professional engineer.
1. Indicate sizes, layout, thicknesses, and loading conditions for glass.

C. Product Data:
   1. Glass: Provide structural, physical, and thermal and solar optical performance characteristics, size limitations, special handling or installation requirements.
   2. Glazing Sealants, Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors where exposed.

D. Design Data: Signed and sealed by professional engineer.
   1. Submit design calculations for glass thicknesses.

E. Samples:
   1. Glass: Submit two samples 12 x 12 inch in size, illustrating each glass units , coloration and design.
   2. Glazing Materials: Submit 6 inch long bead of glazing sealant and gaskets, color as selected.

F. Manufacturer's Certificate: Certify sealed insulating glass, meets or exceeds specified requirements.

G. Installer's Certificate: Certify glass furnished without identification label is installed in accordance with Construction Documents and applicable code.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual , GANA Sealant Manual , GANA Laminated Glass Design Guide for glazing installation methods.

B. Fire Rated Window Glazing: Tested in accordance with NFPA 257 and complying with NFPA 80.
   1. NFPA 257; adjusted so two-thirds of test specimen is above neutral pressure plane at 10 minutes into test.

C. Fire Rated Door Glazing: Tested in accordance with one of the following and complying with NFPA 80.
   1. NFPA 252; with neutral pressure level at 40 inches maximum above sill at 5 minutes into test.
   2. UL 10C.

D. Apply label from agency approved by authority having jurisdiction to identify each fire rated glass lite.

1.6 QUALIFICATIONS

A. Installer: Company specializing in performing Work of this section with minimum three years documented experience approved by manufacturer.

B. Design glass under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.

1.7 PRE-INSTALLATION MEETING

A. Section 01 30 00 - Administrative Requirements: Preinstallation meeting.

B. Convene minimum one week before starting Work of this section.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. Do not install glazing when ambient temperature is less than 50 degrees F.

C. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.9 WARRANTY

A. Section 01 70 00 - Execution and Closeout Requirements: Product warranties and product bonds.

B. Furnish five year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

C. Furnish five year warranty to include coverage for delamination of laminated glass and replacement of same.

D. Furnish five year warranty to include coverage for deterioration of spandrel glass coating and replacement of same.

PART 2 PRODUCTS

2.1 FLOAT GLASS MATERIALS

A. Annealed Glass: ASTM C1036, Type 1 transparent flat, Quality Q3, float glass.
   1. Furnish annealed glass except where heat strengthened or tempered glass is required to meet specified performance requirements.

B. Heat Strengthened Glass: ASTM C1048, Type 1 transparent flat, Quality Q3, Kind HS heat strengthened, Condition A uncoated, float glass.
   1. Furnish heat strengthened glass where annealed glass cannot meet specified performance requirements.

C. Tempered Glass: ASTM C1048, Type 1 transparent flat, Quality Q3, Kind FT fully tempered, Condition A uncoated, float glass with horizontal tempering.
   1. Furnish tempered glass where heat strengthened glass cannot meet specified performance requirements.
   2. Furnish tempered glass conforming to CPSC 16 CFR 1201 at locations where safety glass is required by applicable code.
   3. Furnish laminated glass conforming to Category II of CPSC 16 CFR 1201 at locations where safety glass is required by applicable code.

2.2 GLASS PRODUCTS

A. Manufacturers:
   1. Viracon
   2. Guardian
   3. Substitutions: Section 01 60 00 - Product Requirements.

B. Exterior Glass Types**:** all exterior glazing to be large & small missile impact rated and Section 1.3 Performance Requirements items E and F.

   1. Type 1 – Insulated Vision Glass
      a. Trulite Glass: Solarban® R77 on Solarblue® 6mm (2)
      b. Gas Cavity Dimension: 1/2" (12.7mm) Gas Fill: Air
      c. Indoor Glass Lite: 6mm Clear_060PVB_6mm Clear

   2. Type 2
      a. Guardian Glass: 1/4 Sungard SNX 62/27 HT Green ½ mill
      b. 1/4 SNST (C2) + 1/2 AL
      c. +1/4 CLHS – 030CL – 030CL
      d. -1/4 CLHS (-10 lbs · 34mm · 1 11/32")

2.3 GLAZING SEALANTS

A. Elastomeric Glazing Sealants: Materials compatible with adjacent materials including glass, laminated glass core, insulating glass seals, and glazing channels.

   1. Silicone Glazing Sealant: ASTM C920, Type S, Grade NS, Class and Use suitable for glazing application indicated; single component; chemical solvent curing; capable of water immersion without loss of properties; non-bleeding, non-staining, cured Shore A hardness of 15 to 25.
      a. Structural Silicone: Furnish high-modulus structural silicone glazing materials where sealant bonds glass to substrate.
   2. Polyurethane Glazing Sealant: ASTM C920, Type S, Grade NS, Class and Use suitable for glazing application indicated; single component, chemical curing, non-staining, non-bleeding, Shore A Hardness Range 20 to 35.
      a. Color: As selected.

B. Glazing Compounds:
   1. Glazing Putty: Oil and resin base caulking compound, hardening type; knife grade consistency; manufacturer's standard white color.
   2. Glazing Compound: Modified oil type, non-hardening, knife grade consistency; manufacturer's standard gray color.

C. Dense Gaskets: Resilient extruded shape to suit glazing channel retaining slot; black and gray color.
   1. Neoprene: ASTM C864.
   2. EPDM: ASTM C864.
   3. Silicone: ASTM C1115.

D. Soft Gaskets: ASTM C509; resilient extruded shape to suit glazing channel retaining slot; black and gray color.
   1. Neoprene.
   2. EPDM.
   3. Silicone.
   4. Glazing Tape: Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to effect an air barrier and vapor retarder seal.

2.4 GLAZING ACCESSORIES

A. Setting Blocks: Elastomeric material recommended by glass manufacturer, 80 to 90 Shore A durometer hardness, length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Elastomeric material recommended by glass manufacturer, 50 to 60 Shore A durometer hardness, minimum 3 inch long x one half the height of glazing stop x thickness to suit application.

C. Glazing Clips: Manufacturer's standard type.

2.5 SOURCE QUALITY CONTROL AND TESTS

A. Provide testing and analysis of glass to Section 01 40 00.

B. Provide shop inspection and testing for safety insulating glass.

C. Test insulating glass samples in accordance with ASTM E2190.

D. Heat soak tempered glass in accordance with DIN 18516-4.
   1. Statistical Heat Soaking: Heat soak statistical sampling each type of tempered glass to ensure 95 percent probability of maximum 0.1 percent glass breakage caused by nickel sulfide inclusions.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify openings for glazing are correctly sized and within acceptable tolerance.

C. Verify surfaces of glazing channels or recesses are clean, free of obstructions impeding moisture movement, weeps are clear, and ready to receive glazing.

3.2 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

3.3 INSTALLATION

A. Perform installation in accordance with GANA Glazing Manual.
   1. Glazing Sealants: Comply with ASTM C1193.
   2. Fire Rated Openings: Comply with NFPA 80.

B. Exterior Dry Method (Gasket Glazing):
   1. Cut glazing gasket to length; install on glazing pane. Seal corners by butting tape and sealing junctions with compatible butyl sealant.
   2. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
   3. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
   4. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.

C. Exterior Wet/Dry Method (Preformed Tape and Sealant) Installation:
   1. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with compatible butyl sealant.
   2. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapor seal.
   3. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
   4. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.
   5. Fill gap between glazing and stop with elastomeric glazing sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.
   6. Apply cap bead of elastomeric glazing sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

D. Exterior Wet Method (Sealant and Sealant) Installation:
   1. Place setting blocks at 1/4 points and install glazing pane or unit.
   2. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inches intervals, 1/4 inch below sight line.
   3. Fill gaps between glazing and stops with elastomeric glazing sealant to depth of bite on glazing, but not more than 3/8 inch below sight line to ensure full contact with glazing and continue the air and vapor seal.
   4. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

E. Exterior and Interior Butt Glazed Method (Sealant Only) Installation:
   1. Temporarily brace glass in position for duration of glazing process. Mask edges of glass at adjoining glass edges and between glass edges and framing members.
   2. Temporarily secure small diameter non-adhering foamed rod on back side of joint.
   3. Apply sealant to open side of joint in continuous operation; thoroughly fill joint without displacing foam rod. Tool sealant surface smooth to concave profile.
   4. Permit sealant to cure then remove foam backer rod. Apply sealant to opposite side, tool smooth to concave profile.
   5. Remove masking tape.

F. Interior Dry Method (Tape and Tape) Installation:
   1. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
   2. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
   3. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
   4. Place glazing tape on free perimeter of glazing in same manner described above.
   5. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
   6. Knife trim protruding tape.

G. Interior Wet/Dry Method (Tape and Sealant) Installation:
   1. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch above sight line.
   2. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
   3. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.
   4. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.
   5. Fill gaps between pane and applied stop with elastomeric glazing sealant to depth equal to bite on glazing, to uniform and level line.
   6. Trim protruding tape edge.

H. Interior Wet Method (Compound and Compound) Installation:
   1. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch centers, kept 1/4 inch below sight line.
   2. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

3.4 MANUFACTURER'S FIELD SERVICES

A. Section 01 40 00 - Quality Requirements: Manufacturers’ field services.

B. Glass and glazing product manufacturers to provide field surveillance of installation.

C. Monitor and report installation procedures, and unacceptable conditions.

3.5 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.

B. Remove glazing materials from finish surfaces.

C. Remove labels after Work is complete.

D. Clean glass and adjacent surfaces.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting installed construction.

B. After installation, mark pane with an 'X' by using removable plastic tape or paste.

3.7 SCHEDULE

END OF SECTION

DIVISION 09

FINISHES

SECTION 092116 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Interior metal stud wall framing.
   2. Cementitious board.

1.2 REFERENCE STANDARDS

A. ASTM International:
   1. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
   2. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board.
   3. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
   4. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members.
   5. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
   6. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
   7. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.
   8. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
   9. ASTM C1002 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases.
   10. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
   11. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel.
   12. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing.
   13. ASTM C1288 - Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets.
   14. ASTM C1325 - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets.
   15. ASTM C1396/C1396M - Standard Specification for Gypsum Board.
   16. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
   17. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
   18. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
   19. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

B. American Society of Civil Engineers:
   1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. California Department of Health Services:
   1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.

D. Gypsum Association:
   1. GA 214 - Recommended Levels of Gypsum Board Finish.
   2. GA 216 - Application and Finishing of Gypsum Board.
   3. GA 600 - Fire Resistance Design Manual Sound Control.

E. Intertek Testing Services (Warnock Hersey Listed):
   1. WH - Certification Listings.

F. National Fire Protection Association:
   1. NFPA 265 - Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls, Method B.
   2. NFPA 286 - Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Wall and Ceiling Interior Finish.

G. South Coast Air Quality Management District:
   1. SCAQMD Rule 1168-January 7, 2005 - Adhesive and Sealant Applications.

H. Underwriters Laboratories Inc.:
   1. UL - Fire Resistance Directory.

1.3 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data on metal framing, gypsum board, joint tape; and acoustic accessories.

C. Shop Drawings:
   1. Indicate special details associated with fireproofing, and acoustic seals.
   2. Indicate installation details required for seismic design loads.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM C840. ASTM C1280, GA-214, GA-216 and GA-600.

B. Fire Rated Wall Construction: Rating as indicated on Drawings in conjunction with Section 05 40 00, 06 10 00, 09 22 16.
   1. Tested Rating: Determined in accordance with ASTM E119.
   2. Fire Rated Partitions: Listed assembly by UL (see drawings for UL nos.).

C. Surface Burning Characteristics:
   1. Textile Wall Coverings: Comply with one of the following:
      a. Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
      b. Requirements of applicable code when tested in accordance with NFPA 265 Method B test protocol.
      c. Requirements of applicable code when tested in accordance with NFPA 286.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with documented experience.

B. Installer: Company specializing in performing Work of this section with documented experience.

PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

A. Manufacturers
   1. Gold Bond.
   2. United States Gypsum.
   3. Georgia Pacific.
   4. Substitutions: Section 01 60 00 - Product Requirements.

Note: Refer to Section 05 40 00 Cold-Formed Metal Framing for metal stud manufacturers.

2.2 COMPONENTS

A. Framing Materials:
   1. Studs and Tracks: ASTM C645; GA-216 and GA-600; 6”, 16 gauge. C shape, with knurled faces. Galvanize to G68 class coating.
   2. Furring, Framing, and Accessories: ASTM C645, GA-216 and GA-600.
   3. Fasteners: ASTM C1002, GA-216; length to suit application.
   4. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.
   5. Adhesive: ASTM C557.

B. Cementitious Boards:
   1. Fiber Cement Tile Backer Board: ASTM C1288; 5/8 inch thick; mold resistant.

2.3 ACCESSORIES

A. Cementitious Board Screws: ASTM C954, ASTM C1002; length to suit application.
   1. Screws for Steel Framing: Type S.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify site conditions are ready to receive work and opening dimensions are as indicated on shop drawings.

3.2 INSTALLATION

A. Metal Stud Installation:
   1. Install studs in accordance with ASTM C754.
   2. Install acoustical sealant under floor track of all studs.
   3. Metal Stud Spacing: 16 inches on center.
   4. Refer to Drawings for indication of partitions extending stud framing through ceiling to structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.
   5. Blocking: Nail wood blocking to studs. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, wood frame opening, toilet accessories, hardware, and other accessories.
   6. Install bridging at 1/3 points.

B. Cementitious Board Installation:
   1. Install cementitious board in accordance with GA-216 and GA-600.
   2. Erect single layer cementitious board in most economical direction, with ends and edges occurring over firm bearing.
   3. Use screws when fastening cementitious board to metal furring or framing.

3.3 ERECTION TOLERANCES

A. Section 01400 - Quality Requirements: Tolerances.

B. Maximum Variation of Finished Gypsum Board Surface from Flat Surface: 1/8 inch in 10 feet.

3.4 SCHEDULES

A. Material:

Location	Type
1. Elevator Shaft Walls	Cement Backer Board Substrate

END OF SECTION 092116

SECTION 096623 - TERRAZZO FLOORING

PART 1 – GENERAL

1.2 SUMMARY

A. Section Includes:
1. Thin-set epoxy terrazzo flooring including preparation of substrates.
2. Thin-set precast epoxy terrazzo wall base units.
3. Related accessories.

B. Related Sections:
1. Section 03 30 00, Cast In Place Concrete.
2. Section 04 20 00, Unit Masonry.
3. Section 07 90 01, Joint Protection.
4. Section 09 90 00, Painting and Coating.

1.3 SUBMITTALS

A. Manufacturer's product data for each type of terrazzo and accessory. System will be evaluated on the basis of standards. For tests not listed in published data, manufacturer shall supply missing data according to standard referenced.
1. Physical properties.
2. Performance properties.
3. Specified tests.
4. Material Safety Data Sheet.
5. Manufacturer's standard warranty.

B. Shop Drawings. Include terrazzo installation requirements. Include plans, elevations, sections, component details and attachments to other work. Show layout of the following:
1. Divider strips.
2. Control and expansion joint strips.
3. Base and border strips.
4. Abrasive strips.
5. Stair treads, risers and landings.
6. Pre-cast terrazzo jointing and edge configurations including anchorage details.
7. Terrazzo patterns.

C. Samples for initial selection from Terrazzo & Marble Supply color plates showing the full range of colors and patterns available for each terrazzo type indicated.

D. Samples for Verification: Match architect's samples for each type, material, color and pattern of terrazzo and accessory required showing the full range of color, texture and pattern variations expected. Label each terrazzo sample to identify Terroxy Resin System's matrix color and aggregate types, sizes and proportions. Prepare samples of same thickness and from same material to be used for the work in size indicated below:
1. Epoxy terrazzo: minimum 6" x 6" (152.4 mm x 152.4 mm) sample of each color and type of terrazzo.
2. Precast epoxy terrazzo: minimum 6" x 6" (152.4 mm x 152.4 mm) sample of each color and type of terrazzo.
3. Accessories: 6" length (152.4 mm) of each kind of divider strip, stop strip and

control joint strip required.

4. Stair Treads: 12” length (304.8 mm) wide sample combination tread/riser with cast-in nosing.

E. Manufacturer Experience:
   1. Submit proof of associate membership to NTMA (TTMAC - Canada).
   2. Furnish a list of at least five (5) epoxy terrazzo projects using material being submitted for this project installed during the last five (5) years of the same scope, complexity and at least 50 percent of the square footage.
   3. Engage an epoxy manufacturer with at least ten (10) years experience.

F. Qualification Data: For qualified installer.
   1. Submit proof of contractor membership in NTMA (TTMAC - Canada).
   2. Furnish a list of at least five (5) epoxy terrazzo projects using material being submitted for this project installed during the last five (5) years of the same scope, complexity and at least 50 percent of the square footage.

G. Material Test Reports: For moisture and/or relative humidity of substrate.

H. Maintenance Data: Submit two copies of NTMA (TTMAC - Canada) maintenance recommendations and 2 copies of manufacturer’s instructions

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who is acceptable to architect and epoxy terrazzo manufacturer to install manufacturer’s products.
   1. Engage a terrazzo contractor with at least five (5) years of satisfactory experience in installation of epoxy terrazzo. Terrazzo contractor shall demonstrate experience during last five (5) years of at least five (5) projects of comparable scope and complexity of at least 50 percent of the total square footage of this project
   2. Engage an installer who is a contractor member of NTMA (TTMAC - Canada).

B. Source Limitations:
   1. Obtain primary Epoxy Terrazzo Flooring System materials including moisture treatment, membranes, primers, resins and hardening agents from a single manufacturer with proof of NTMA (TTMAC - Canada) associate membership.
   2. Obtain aggregates, divider strips, sealers and cleaners from source recommended by primary materials manufacturer.
   3. Engage an epoxy manufacturer with at least ten (10) years experience as a NTMA (TTMAC - Canada) associate member.

C. Pre-installation Conference: Conduct conference at project site to comply with requirements in Section 01 20 00 – Project Meetings. Review methods and procedures related to terrazzo including, but not limited to, the following:
   1. Inspect and discuss installation procedures, joint details, job site conditions, substrate specification, vapor barrier details and coordination with other trades.
   2. Review and finalize construction schedule and verify availability of materials, installer’s personnel, equipment and facilities needed to make progress and avoid delays.
   3. Review special terrazzo designs and patterns.
   4. Review plans for concrete curing and site drying to enable timely achievement of suitable slab moisture conditions.

D. NTMA (TTMAC - Canada) Standards: Comply with NTMA's (TTMAC - Canada) "Terrazzo Specifications and Design Guide" and with written recommendations for terrazzo type indicated unless more stringent requirements are specified.

E. Mock-ups: Build mock-ups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Build mock-ups for terrazzo including accessories.
      a. Size: Minimum 100ft2 (9.3m2) of typical poured-in-place flooring [and base] condition for each color and pattern [in locations directed by architect] <Insert location requirements>.
   2. Approved mockups may become part of the completed work if undisturbed at time of substantial completion.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in supplier's original wrappings and containers labeled with source's or manufacturer's name, material or product brand name and lot number if any.

B. Store materials in their original, undamaged packages and containers inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures and humidity.
   1. Storage temperatures should be between 50ºF to 90ºF (10.0ºC to 32.2ºC).

1.6 PROJECT CONDITIONS

A. Prior to surface preparation, terrazzo contractor shall:
   1. Evaluate slab condition, including slab moisture content and extent of repairs required, if any.
   2. Maintain the ambient room and floor temperature at 60-90ºF (15.5-32.2ºC)or above for a period extending 72 hours before, during and after floor installation. Concrete to receive epoxy terrazzo shall have cured for at least 28 days and be free of all curing compounds. Test concrete substrate to determine acceptable moisture levels prior to installation. Testing should be conducted according to ASTM F2170 (determining relative humidity in concrete slabs using in situ probes). Proceed with installation only after substrates have a maximum relative humidity measurement reading less than 80%. If relative humidity measurement reading is greater than or equal to 80%, Terroxy Moisture Vapor Treatment or IC Moisture Guard is required. Apply to terrazzo substrates according to Terroxy Product Data Sheets. An effective in situ probe for relative humidity testing is the RH BluePeg available from T&M Supply.

B. Prior to and during each day of installation, the terrazzo contractor shall verify that the dew point is at least 5ºF (-15ºC) less than the slab and air temperature.

C. Acceptable Substrates:
   1. Level tolerance: Concrete sub-floor shall be level with a maximum variation from level of 1/4" in 10 feet (6.4 mm in 3.1m). Any irregularity of the surface requiring patching and/or leveling shall be done using Terroxy Fill and selected aggregates as recommended by Terroxy Resin Systems.
   2. Concrete floor shall be prepared mechanically by shot blasting in accordance

with ICRI Guideline No. 03732. Specifically, surface preparation results should achieve a CSP3-CSP5 profile.

3. A light steel trowel is needed to provide an acceptable surface with minimum laitance.
4. Concrete shall be cured a minimum of 28 days. No curing agents are to be used in areas to receive terrazzo.
5. Concrete slab on grade shall have an efficient moisture vapor barrier (suggested minimum: 15 mils (.4 mm thickness)) directly under the concrete slab. Reference ASTM Methods E1745 Class A and installed in accordance with E1643. Moisture barrier shall NOT be punctured.
6. Saw cutting of control joints must be done between 12 and 24 hours after placement of the structural concrete and at a frequency compatible to ACI recommendations.

D. Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.

E. Provide protection from other trades prior to final acceptance by owner.

PART 2 – PRODUCTS

2.01 EPOXY TERRAZZO

A. Products: Systems Overview: The basis of design is Terroxy Resin Systems Epoxy Matrix by Terrazzo & Marble Supply Companies, (www.tmsupply.com). Contact Eric Portillo; (281) 620-6703; eportillo@tmsupply.com

B. Materials:

1. Primer: Terroxy Primer or Terroxy Moisture Vapor Treatment (for slabs on-grade, light weight concrete and green concrete).
   a. Physical properties of moisture mitigating primer shall have a maximum of 0.3 perms with 100% RH.
2. Flexible Reinforcing Membrane: Terroxy Iso-Crack Epoxy Membrane, for substrate crack preparation and reflective crack reduction.
   a. Reinforcement: Terroxy fiberglass scrim (optional).
3. Epoxy Matrix: Terroxy Epoxy Matrix and in color required for mix indicated.
   a. Physical properties without aggregates. All specimens cured for 7 days at 73-77ºF (22.8-25ºC) and 50 percent plus or minus 2 percent RH. This product shall meet the following requirements:

Property	Test Method	NTMA (TTMAC - Canada) Requirements	Terroxy Thin-set Epoxy Terrazzo Typical Results
Hardness	ASTM D-2240 using Shore-D Durometer	60-85	75-85
Tensile Strength	ASTM D-638	3,000 psi min. (20.7 MPa)	4,800 psi min. (33.1 MPa)
Compressive Strength	ASTM D-695 Specimen B cylinde	10,000 psi min. (68.9 MPa)	12,000 psi min. (82.7 MPa)
Flexural Strength	ASTM D-790	Not specified	4,500 psi min. (31.7 MPa)

Chemical Resistance	ASTM D-1308 seven days at room temperature by immersion method	No deleterious effects: • Distilled Water • Mineral Oil • Isopropanol • Ethanol • 0.025 Detergent Solution • 1% Soap Solution • 10% Sodium Hydroxide • 10% Hydrochloric Acid • 30% Sulfuric Acid • 5% Acetic Acid	No deleterious effects: • Distilled Water • Mineral Oil • Isopropanol • Ethanol • 0.025 Detergent Solution • 1% Soap Solution • 10% Sodium Hydroxide • 10% Hydrochloric Acid • 30% Sulfuric Acid • 5% Acetic Acid

b. Physical properties with aggregates. For Epoxy Matrix blended with three volumes of various aggregates included but not limited to North American Marbles including Blanco Mexicano, China White, Blue Coal; Recycled Glass Aggregates included Jade Glass and One sided mirror; and Imported Aggregates such as mother of pearl. Blended using #1, #0, & #2 chips and finished in a nominal 3/8" (9.5 mm) thickness. Contractor to work with designer for all specific blends for final approval. All specimens cured for 7 days at 73-77ºF (22.8-25ºC) and 50 percent RH plus or minus 2 percent RH. This finished Epoxy Matrix shall meet the following requirements:

Property	Test Method	NTMA (TTMAC - Canada) Requirements	Terroxy Thin-set Epoxy Terrazzo Typical Results
Flammability	ASTM D-635	Self extinguishing, extent of burning 0.25" (6.4 mm) max.	Self extinguishing, extent of burning 0.25" (6.4 mm) max
Thermal Coefficient of Linear Expansion	ASTM D-696	25x10-6 inches per inch per degrees to 140ºF (11.4x10-7 cm per cm per ºC to 60ºC Max)	25x10-6 inches per inch per degrees to 140ºF (11.4x10-7 cm per cm per ºC to 60ºC Max)
Bond Strength	ACI COMM 403, Bulletin 59-43 (pages 1139-1141)	300 psi (2.1 MPa) -100% concrete failure	300 psi (2.1 MPa) -100% concrete failure
Critical Radiant Flux	ASTM E-648		1.0 watts/cm^2
Fire Rating - Test for Surface Burning Characteristics of Flooring	CAN/ULC S102.2-10 Tunnel Test		Smoke Developed Classification (SDC) - 175 Flame Spread Rating (FSR) - 5

2.2 STRIP MATERIALS

A. Thin-set Divider Strips: L-type.
   1. Material White-zinc alloys elected from Domus Terrazzo full range.
   2. Guide for commonly used L-type divider strips for Thin-set Epoxy Terrazzo Systems:

2.3 MISCELLANEOUS ACCESSORIES

A. Strip Adhesive: 100% solids epoxy resin adhesive recommended by Terroxy Resin Systems.
   1. Use adhesive that has a VOC content of 50g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Construction joints, contraction joint
C. ts (Saw Cuts), isolation joints and cracks shall be detailed in accordance with NTMA

(TTMAC - Canada) technical bulletin T24

D. Patching and Fill Material: Terroxy Fill and selected aggregates as recommended by Terroxy Resin Systems.

E. Joint Compound: Terroxy Joint Filler Hardener to be used with Terroxy Resin Matrix Part A. Color to be selected by architect to match/compliment terrazzo flooring.

F. Cleaner: A neutral cleaner with pH factor between 7 & 10 specifically designed for terrazzo.

G. Surface Finish System: Level of polish to be specified by architect in accordance with desired appearance and level of reflectivity.

H. Sealer: Slip and stain-resistant sealer that is chemically neutral with a pH factor between 7 and 10, that meets a standard coefficient of friction of 0.5 or higher, as measured by the James Machine (ASTM D-2047 Test Method), does not affect physical properties of terrazzo and complies with NTMA's (TTMAC - Canada)" Terrazzo Specifications and Design Guide."

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine substrates and areas, with Terrazzo Contractor present for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions, including level tolerances have been corrected.

3.2 PREPARATION

A. Clean substrates of substances, including oil, grease and curing compounds, that might impair terrazzo bond. Provide clean, dry and neutral substrate for terrazzo application.

B. Concrete Slabs:
   1. Provide sound concrete surface free of laitance, glaze, efflorescence, curing compounds, form- release agents, dust, dirt, grease, oil and other contaminants incompatible with terrazzo.
      a. Prepare concrete mechanically by shot blasting. Surface preparation results should achieve a CSP3- CSP5 profile according to International Concrete Repair Institute Guideline No. 03732.
      b. Repair or level damaged and deteriorated concrete according to Terroxy Resin Systems Technical Bulletin 008 Substrate Leveling Requirements for Terroxy Thin-set epoxy terrazzo.
      c. Repair cracks and non-expansion joints greater than 1/16" (1.6mm) wide according to NTMA (TTMAC - Canada) Technical Bulletin T26 Crack Detailing and Joint Treatments for Terroxy Resin Thin-set epoxy terrazzo.
   2. Verify that concrete substrates are visibly dry and free of moisture.
   3. Moisture Testing:

a. Test for moisture according to ASTM F2170 (determining relative humidity in concrete slabs using in situ probes). An effective in situ probe for relative humidity testing is the Blue Peg available from Terrazzo & Marble Supply.
b. Proceed with installation only after substrates have a maximum relative humidity measurement reading less than 80%. If relative humidity measurement reading is greater than or equal to 80%, Terroxy Moisture Vapor Treatment is required. Apply to terrazzo substrates according to Terroxy Resin Systems Moisture Vapor Treatment Product Data Sheet.

C. The Terrazzo Subcontractor shall retain the services of an independent testing laboratory to verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to epoxy resin manufacturer's written instructions.
1. Perform Calcium Chloride Test in accordance with ASTM F1869 and Relative Humidity Test (RH test) in accordance with ASTM F-2170. If tests indicate vapor mitigation barrier is required, install vapor mitigation barrier as recommended by floor manufacturer, at no additional cost to Owner.
a. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
b. Proceed with application of resinous flooring only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. of slab area in 24 hours

D. Alkalinity and Adhesion Testing: The General Contractor shall retain the services of an independent testing laboratory to verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.

E. Protect other work from dust generated by grinding operations. Control dust to prevent air pollution and comply with environmental protection regulations.
a. Erect and maintain temporary enclosures and other suitable methods to limit dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.

3.3 EPOXY TERRAZZO INSTALLATION

A. General:
1. Comply with NTMA's (TTMAC - Canada) written recommendations for terrazzo and accessory installation.
2. Place, rough grind, grout, cure grout, fine grind and finish terrazzo according to Terroxy Resin Systems Epoxy Matrix Product Data Sheet and NTMA's (TTMAC - Canada) "Terrazzo Specifications and Design Guide."
3. Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control-joint strips.
4. Delay fine grinding until heavy trade work is complete and construction traffic through area is restricted.

B. Thickness: 3/8" (9.5 mm)

C. Flexible Reinforcing Membrane
1. Option 1: Membrane application for isolated cracking. Route out all cracks and

fill with 100% Terroxy Primer. Apply Terroxy Iso-Crack Epoxy Membrane (spread at 40 mils = 1.0 mm thickness) across the crack allowing 6“ (152.4mm) on either side. Imbed fiberglass scrim at a minimum of 9” (22.8cm) into wet membrane and saturate with additional membrane.

2. Option 2: Membrane application for extensive cracking or crack prevention. Route out all cracks and fill with 100% Terroxy Primer. Apply Terroxy Iso-Crack Epoxy Membrane (spread at 40 mils = 1.0 mm thickness) over prepared substrate to produce full substrate coverage in areas to receive terrazzo. (fiberglass scrim optional)

D. Primer: Apply to terrazzo substrates according to Terroxy Resin Systems Primer Product Data Sheet.

E. Strip Materials:
1. Divider and Accessory Strips:
   a. Install strips in adhesive setting bed without voids below strips.
   b. Construction joints, contraction joints (Saw Cuts), isolation joints and cracks shall be detailed in accordance with NTMA (TTMAC - Canada) technical bulletin T24.

E. Placing Terrazzo:
1. Mix epoxy matrix with chips and fillers in ratios directed by Terroxy Resin Systems.
2. Trowel apply terrazzo mixture over epoxy primer to provide a dense flat surface to top of divider strips. Allow to cure per Terroxy Resin Systems recommendations before rough grinding.

G. Rough Grinding: Grind with 24 grit silicon carbide or 24 grit turbo diamonds until all terrazzo strips and marble chips are uniformly exposed.

H. Grouting:
1. Cleanse floor with clean water and rinse.
2. Remove excess rinse water by wet vacuum, dry and fill voids with Terroxy Resin Systems Epoxy Matrix or Clear Resin with a broadcast of filler.
3. Allow grout to cure. Grout may be left on terrazzo until other trades work is completed.

I. Polishing: Polish with 120 grit T&M Resin Pads or equivalent stones until all grout is removed from surface. Produce surface with a minimum of 70 percent aggregate exposure.

3.4 CLEANING AND PROTECTION

A. Cleaning: Remove grinding dust from installation and wash all surfaces with a neutral cleaner with a pH factor between 7-10 .

B. Sealing: Apply Terroxy WB sealer that is chemically neutral with a pH factor between 7 and 10, that meets a standard coefficient of friction of 0.5 or higher, as measured by the James Machine (ASTM D-2047 Test Method), does not affect physical properties of terrazzo and complies with NTMA’s (TTMAC - Canada)

C. Protection: Upon completion, the work shall be ready for final inspection and acceptance by the owner or his agent. Provide final protection and maintain conditions, in a manner

acceptable to terrazzo contractor, that ensure terrazzo is without damage or deterioration.

END OF SECTION 096623

SECTION 099000 - PAINTING AND COATING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Surface preparation and field application of paints, stains, varnishes, and other coatings.

B. Related Requirements:

1. Section 055000 - Metal Fabrications: Shop-primed items.
2. Section 081213 – Standard Hollow Metal Frames.
3. Section 081313 – Standard Hollow Metal Doors.

1.2 DEFINITIONS

A. Refer to ASTM D16 for definitions of terms used in this Section.

1.3 REFERENCE STANDARDS

A. ASTM International:

1. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.
2. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials.
3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. California Department of Public Health:

1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.

C. Green Seal:

1. GS-03 - Anti-Corrosive Paints.
2. GS-11 - Paints and Coatings.

D. Master Painters Institute:

1. MPI - Approved Products List.
2. MPI - Architectural Painting Manual.

E. South Coast Air Quality Management District:

1. SCAQMD Rule 1113 - Architectural Coatings.

1.4 SEQUENCING

A. Section 011000 - Summary: Requirements for sequencing.

B. Do not apply finish coats until paintable sealant is applied.

C. Back prime wood trim before installation of trim.

1.5 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data:

1. Submit manufacturer data on finishing products.
2. Include MPI - Approved Products Lists with proposed products highlighted.

C. Samples:

1. Submit two paper chip samples, 12 by 12 inches in size, illustrating range of colors and textures available for each surface finishing product as scheduled.
2. Painted Samples:

    a. Submit two painted samples, illustrating selected colors and textures for each selected color and system with specified coats cascaded.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer Instructions: Submit special surface preparation procedures, substrate conditions requiring special attention.

F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

G. Qualifications Statements:

1. Submit qualifications for manufacturer and applicator.
2. Submit manufacturer's approval of applicator.

1.6 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.

B. Operation and Maintenance Data: Submit information on cleaning, touchup, and repair of painted and coated surfaces.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.

1.8 QUALITY ASSURANCE

A. MPI Standards:

1. Comply with indicated MPI standards.
2. Products: Listed in MPI - Approved Products List.

B. Surface Burning Characteristics:

1. Fire-Retardant Finishes: Maximum 25/450 flame-spread/smoke-developed index when tested according to ASTM E84.

1.9 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

B. Applicator: Company specializing in performing Work of this Section with minimum three years' documented experience and approved by manufacturer.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Container Labeling: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Inspection:

1. Accept materials on Site in manufacturer's sealed and labeled containers.
2. Inspect for damage and to verify acceptability.

D. Store materials in ventilated area and otherwise according to manufacturer instructions.

E. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.11 AMBIENT CONDITIONS

A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.

B. Storage Conditions:

1. Minimum Ambient Temperature: 45 degrees F.
2. Maximum Ambient Temperature: 90 degrees F

C. Application Conditions:

1. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint manufacturer.
2. Do not apply exterior coatings during rain or snow, when relative humidity is outside humidity ranges, or when moisture content of surfaces exceeds those required by paint manufacturer.
3. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors and 50 degrees F for exteriors, unless otherwise indicated by manufacturer instructions.
4. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interiors and exteriors, unless otherwise indicated by manufacturer instructions.
5. Lighting Level: 80 fcmeasured mid-height at substrate surface.

1.12 WARRANTY

A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.

B. Furnish five-year manufacturer's warranty for paint and coatings.

PART 2 - PRODUCTS

2.1 PAINTS AND COATINGS

A. Manufacturers:

1. Benjamin Moore.
2. Sherwin Williams.
3. Substitutions: As specified in Section 016000 - Product Requirements.

B. Materials:

1. Coatings:

a. Ready mixed, except field-catalyzed coatings.
b. Capable of drying or curing free of streaks or sags.

2. Patching Materials: Latex filler.
3. Fastener Head Cover Materials: Latex filler.
4. Accessories:

a. Grade: Commercial.
b. Linseed oil.
c. Shellac.
d. Turpentine.
e. Paint thinners.
f. Other materials not specifically indicated but required to achieve specified finishes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for application examination.

B. Verify that surfaces are ready to receive Work as recommended by product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of Work, and report conditions capable of affecting proper application to Architect/Engineer.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Moisture Content:

1. Measure moisture content of surfaces using electronic moisture meter.
2. Do not apply finishes unless moisture content of surfaces are below following maximums:

a. Plaster and Gypsum Wallboard: 12 percent.
b. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
c. Interior Wood: 15 percent, measured according to ASTM D4442.
d. Exterior Wood: 15 percent, measured according to ASTM D4442.
e. Concrete Floors: 8 percent.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for application preparation.

B. Prepare coatings as follows:

1. To soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coating.
2. For smooth flow and brushing properties.

C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

D. Defects:

1. Correct defects and clean surfaces capable of affecting Work of this Section.

E. Marks: Seal marks that may bleed through surface finishes with shellac.

F. Impervious Surfaces:

1. Remove mildew by scrubbing with solution of [**tetra-sodium**] [**tri-sodium**] phosphate and bleach.
2. Rinse with clean water and allow surface to dry.

G. Galvanized Surfaces:

1. Remove surface contamination and oils, and wash with solvent.
2. Apply coat of etching primer.

H. Uncoated Steel and Iron Surfaces:

1. Remove grease, mill scale, weld splatter, dirt, and rust.
2. If heavy coatings of scale are evident, remove by power tool wire brushing or by sandblasting.
3. Clean by washing with solvent.
4. Apply treatment of phosphoric acid solution, ensuring that weld joints, bolts, and nuts are similarly cleaned.
5. Spot-prime paint after repairs.

I. Shop-Primed Steel Surfaces:

1. Sand and scrape to remove loose primer and rust.
2. Feather edges to make touch-up patches inconspicuous.
3. Clean surfaces with solvent.
4. Prime bare steel surfaces and Prime metal items, including shop-primed items.

J. Metal Doors and Frames Scheduled for Painting: Prime metal door at top and bottom edge surfaces.

3.3 APPLICATION

A. Comply with MPI - Architectural Painting Manual.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform appearance.

D. Apply each coat of paint slightly darker than preceding coat, unless specified otherwise.

E. Sand wood and metal surfaces lightly between coats to achieve required finish.

F. Cleaning:

1. Vacuum surfaces to remove loose particles.
2. Use tack cloth to remove dust and particles just prior to applying next coat.

G. Fillers:

1. If clear finishes are required, tint fillers to match wood.
2. Work fillers into grain before set, and wipe excess from surface.

3.4 FIELD QUALITY CONTROL

A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.

B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

C. Inspecting and Testing: Comply with MPI - Architectural Painting Manual.

3.5 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

B. Collect waste material that may constitute fire hazards, place in closed metal containers, and remove daily from Site.

3.6 SCHEDULE – SHOP PRIMED FOR SITE FINISHING

A. Metal Fabrications (Section 055000): Exposed surfaces of lintels, steel ladders, and pipe bollards.

B. Standard Steel Frames (Section 081214): Exposed surfaces of frame and glass lite frame.

C. Standard Steel Doors (Section 081314): Exposed surfaces of door including top and bottom edge.

3.7 SCHEDULE

A. Exterior Surfaces:
   1. Interior Steel - Unprimed:
      a. One coat of HP1320 Primer.
      b. Two coats of HP3300 DTM Acrylic Enamel semi-gloss.
   2. Steel - Shop Primed:
      a. One coat of HP1320 Primer.
      b. Two coats of HP3300 DTM Acrylic Enamel semi-gloss.
   3. Concrete:
      a. Two coats of Elastomeric. (See Section 099663)
   4. Pavement Striping
      a. Benjamin Moore: Insl-X Traffic Coatings (yellow, blue at Handicap Spaces)

END OF SECTION 099000

SECTION 099653 – ELASTOMERIC COATING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Application of high-build, water-based, elastomeric, 100 percent acrylic, waterproof coating.

B. Related Sections:
   1. Section 03 30 00 – Cast-in-Place Concrete.

1.2 SUBMITTALS

A. Comply with Section 01 33 00 – Submittal Procedures.

B. Product Data: Submit manufacturer's technical data sheets and LEED product information for each product.

C. Submit list of project references as documented in this Specification under Quality Assurance Article. Include contact name and phone number of person charged with oversight of each project.

D. Quality Control Submittals: Provide protection plan of surrounding areas and non-cementitious surfaces.

1.3 QUALITY ASSURANCE

A. Comply with Section 01 40 00 – Quality Requirements.

B. Qualifications:
   1. Manufacturer Qualifications: Company with minimum 15 years of experience in manufacturing of specified products.
   2. Manufacturer Qualifications: Company shall be ISO 9001:2000 Certified.
   3. Applicator Qualifications: Company with minimum of 5 years experience in application of specified products on projects of similar size and scope, and is acceptable to product manufacturer.
      a. Successful completion of a minimum of 5 projects of similar size and complexity to specified Work.

C. Field Sample:
   1. Install at Project site or pre-selected area of building an area for field sample, minimum 4 feet by 4 feet (1.2 m by 1.2 m), using specified material.
   2. Apply material in accordance with manufacturer’s written application instructions.
   3. Manufacturer’s representative or designated representative will review technical aspects; surface preparation, repair, and workmanship.
   4. Field sample will be standard for judging workmanship on remainder of Project.
   5. Maintain field sample during construction for workmanship comparison.
   6. Do not alter, move, or destroy field sample until Work is completed and approved by Architect.
   7. Obtain Architect’s written approval of field sample before start of material

application, including approval of aesthetics, color, texture, and appearance.

8. Perform adhesion test in accordance with ASTM D3359, Method A. Minimum adhesion rating of 4A required on 0 to 5 scale.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with Section 01 60 00 – Product Requirements.

B. Comply with manufacturer’s ordering instructions and lead-time requirements to avoid construction delays.

C. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

D. Store tightly sealed materials off ground and away from moisture, direct sunlight, extreme heat, and freezing temperatures.

1.5 PROJECT CONDITIONS

A. Environmental Requirements:

1. Do not apply material when substrate or ambient temperature is 40 degrees F (4 degrees C) or below or is expected to fall below 40 degrees F (4 degrees C) within 24 hours after application.
2. Do not apply material if rain is expected within 24 hours of application.
3. Do not apply material to sloped (less than 60 degrees) or horizontal surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products from the following manufacturer:

B. Sika Corporation, 201 Polito Avenue, Lyndhurst NJ 07071. Toll Free 800-933-SIKA (7452), www.sikausa.com.

C. Substitutions: Comply with Section 01 60 00 – Product Requirements.

D. Specifications and Drawings are based on manufacturer's proprietary literature from Sika. Other manufacturers shall comply with minimum levels of material, color selection, and detailing indicated in Specifications or on Drawings. Architect will be sole judge of appropriateness of substitutions.

2.2 MATERIALS

A. High-build, water-based, elastomeric, 100 percent acrylic, waterproof coating.

1. Sika Thorolastic® -750 Sika.
2. Sherwin Williams: Comex Texturi

B. Sika Thorolastic® -750 Fine:

1. Density, ASTM D1475: 10.2 to 11.2 lbs per gal (1.22 to 1.34 kg/L).
2. Solids Content, ASTM D5201:
   a. By Weight: 65.5 percent.

b. By Volume: 56 percent.
3. Viscosity, ASTM D562: 127 to 135 KU.
4. VOC Content, ASTM D3960: 0.32 to 0.42 lbs per gal (38 to 50 g/L), less water and exempt solvents.

C. Sika Thorolastic® -750 Coarse:
1. Density, ASTM D1475: 9.9 to 10.9 lbs per gal (1.19 to 1.31 kg/L).
2. Solids Content, ASTM D5201:
a. By Weight: 64.5 percent.
b. By Volume: 58 percent.
3. Viscosity, ASTM D562: 127 to 135 KU.
4. VOC Content, ASTM D3960: 0.32 to 0.42 lbs per gal (38 to 50 g/L), less water and exempt solvents.

D. Performance Requirements: Sika Thorolastic® -750 applied at 16 mils DFT:
1. Ultimate Elongation, ASTM D412: 344 percent.
2. Elongation Recovery, ASTM D412:
a. After 10 Minutes: 96.9 percent.
b. After 24 Hours: 98.4 percent.
3. Ultimate Tensile Strength, ASTM D412: 220 psi (1.5 MPa).
4. Crack Bridging, PR EN 1062-7:
a. At minus 77 degrees F (minus 60 degrees C): 12 mils (0.3 mm).
b. At 32 degrees F (0 degrees C): 19.5 mils (0.5 mm).
c. At 73 degrees F (23 degrees C): 27.5 mils (0.7 mm).
5. Flexibility, ASTM D522, at minus 30 degrees F (minus 34 degrees C): 1/8 inch (3 mm) mandrel.
6. Pull-Off Strength Adhesion, ASTM D4541: 210 psi (1.4 MPa).
7. Wind-Driven Rain, Federal Specification TT-C-555B: Passes.
8. Water-Vapor Permeance, ASTM D1653: 10 perms.
9. Carbon-Dioxide Diffusion, PR EN 1062-6:
a. R (equivalent air-layer thickness): 263 feet (80 m).
b. Sc (equivalent concrete thickness): 8 inches (20 cm).
10. Accelerated Weathering, ASTM G23, Type D, 5,000 hours: Passes.
11. Visual Color Change, ASTM D1729, 5,000 hours: Passes.
12. Chalking, ASTM D4214, 5,000 hours: Passes.
13. Freeze/Thaw Resistance, ASTM C67, 60 cycles: Passes.
14. Salt-Spray Resistance, ASTM B117, 300 hours: Passes.
15. Dirt Pick-Up, ASTM D3719, after 6 months exposure: 94.33 percent.
16. Mildew Resistance, ASTM D3273 and 3274: No growth.

E. Approximate Coverage Rate: 50 to 100 sq ft per gal (4.6 to 9.3 m2/L).

F. Wet Film Thickness (WFT):
1. Smooth: 16 to 32 mils (406 to 813 microns).
2. Fine: 16 to 32 mils (406 to 813 microns).
3. Coarse: 16 to 32 mils (406 to 813 microns).

G. Dry Film Thickness (DFT):
1. Smooth: 8 to 16 mils (203 to 406 microns).
2. Fine: 9 to 18 mils (229 to 457 microns).
3. Coarse: 9 to 19 mils (229 to 483 microns).

H. Colors: As selected.

I. Texture:
   1. Contractor to provide a sample of fine and coarse finish. Architect to select one for installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Comply with Section 01 70 00 – Execution and Closeout Requirements.

3.2 SURFACE PREPARATION

A. Protection: Protect adjacent Work areas and finish surfaces from damage during coating application.

B. Prepare surfaces in accordance with manufacturer's instructions.

C. Ensure that substrate is sound, clean, dry, and free of dust, dirt, oils, grease, laitance, efflorescence, mildew, fungus, biological residues, and other contaminants that could prevent proper adhesion.

D. Clean surface to achieve texture similar to medium-grit sandpaper.

E. Repair holes and spalled and damaged concrete with repair materials approved by coating manufacturer.

F. Remove protruding concrete accessories and smooth out irregularities.

G. When chemical cleaners are used, neutralize compounds and fully rinse surface with clean water. Allow surface to dry before proceeding.

H. Remove blisters or delaminated areas and sand edges to smooth rough areas and provide transition to existing paint areas.

I. Check adhesion of existing paint in accordance with ASTM D3359, measuring adhesion by Tape Method A.

J. Concrete Surfaces:
   1. Cure concrete a minimum of 28 days before application.
   2. Remove laitance, bond-inhibiting contaminants, form-release agents, and sealers.
   3. Remove form tie wires and repair holes, small voids, and spalls using appropriate repair product approved by coating manufacturer.
   4. Abrasive-blast slick, dense concrete surfaces or use primer approved by coating manufacturer. Test surface for proper adhesion.
   5. Prepare concrete with a sand and cement rubbed finish.

K. Crack Preparation and Pretreatment:
   1. Treat cracks larger than 1/32 inch (0.8 mm) and up to 1/16 inch (1.6 mm) with brush-grade acrylic crack filler approved by coating manufacturer.
   2. Treat cracks larger than 1/16 by 1/16 inch (1.6 by 1.6 mm) but less than 1/4 by 1/4 inch (6 by 6 mm) with knife-grade acrylic crack filler approved by coating manufacturer.
   3. Treat moving cracks larger than 1/4 by 1/4 inch (6 by 6 mm) with internally

plasticized polyurethane sealant approved by coating manufacturer.

4. Apply test application of crack repair materials in inconspicuous location to ensure compatibility and aesthetic approval.

3.3 MIXING

A. Mix coating in accordance with manufacturer's instructions to ensure uniform color and aggregate disbursement and to minimize air entrapment.

B. In multi-pail applications, mix contents of each new pail into partially used pail to ensure color consistency and smooth transitions from pail to pail.

3.4 APPLICATION

A. Apply coating in accordance with manufacturer's instructions.

B. Apply coating as a 2-coat system.

C. Maintain proper uniform wet-film thickness during application to ensure performance characteristics desired.

D. Apply coating to achieve pinhole-free, consistent film build on coated surfaces.

3.5 PROTECTION

A. Protect applied coating from damage during construction.

3.6 SCHEDULE

A. Exterior exposed concrete as shown on drawings; 2 coats.

B. Contractor to submit fine and coarse samples for selection.

END OF SECTION 099653

DIVISION 10

SPECIALTIES

SECTION 104400 - FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes fire extinguishers and fire extinguisher cabinets.

1.2 REFERENCES

A. National Fire Protection Association:
   1. NFPA 10 - Standard for Portable Fire Extinguishers.

B. Underwriters Laboratories Inc.:
   1. UL - Fire Protection Equipment Directory.

1.3 PERFORMANCE REQUIREMENTS

A. Conform to NFPA 10.

B. Provide extinguishers classified and labeled by Underwriters Laboratories Inc. for purpose specified and indicated.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate cabinet physical dimensions, rough-in measurements for recessed cabinets location.

C. Product Data: Submit extinguisher operational features, color and finish, anchorage details.

D. Manufacturer's Installation Instructions: Submit special criteria and wall opening coordination requirements.

E. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.

B. Operation and Maintenance Data: Submit test, refill or recharge schedules and re-certification requirements.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Do not install extinguishers when ambient temperature are capable of freezing extinguisher ingredients.

PART 2 PRODUCTS

2.1 FIRE EXTINGUISHERS

A. Manufacturers:
   1. JL Industries.
   2. Larsen's Manufacturing Co.
   3. Substitutions: Section 01 60 00 - Product Requirements.

B. Dry Chemical Type: Cast steel tank, with pressure gauge; Class 2A: 10BC. Size to fit cabinet.

C. Extinguisher Finish: Clear anodized aluminum.

2.2 FIRE EXTINGUISHER WALL MOUNTED CABINET

A. Jonesco Fire Extinguisher Cabinet: Model No. JEBE06.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify rough openings for cabinet are correctly sized and located.

3.2 INSTALLATION

A. Install wall brackets, maximum 48 inches from finished floor to top of extinguisher handle.

B. Secure rigidly in place.

C. Place extinguishers in bracket.

END OF SECTION 104400

DIVISION 11

EQUIPMENT

DIVISION 12

FURNISHINGS

DIVISION 13

SPECIAL CONSTRUCTION

DIVISION 14

CONVEYING EQUIPMENT

SECTION 142100 - ELECTRIC TRACTION ELEVATORS

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Electric Traction Elevators

B. Products Supplied but Not Installed Under this Section:
1. Hoist Beam
2. Pit Ladder
3. Inserts mounted in block walls for rail attachments

C. Work Supplied Under Other Sections:
1. Temporary lighting, including temporary lighting in hoistway for machine space with switch located in hoistway on the strike jamb side of top landing door.
2. Main line disconnects for each elevator.
   a. One fused three phase permanent power in building electrical distribution room
3. Hoistway ventilation shall be in accordance with local and national building code requirements.
4. Guide Rail Support shall be structurally adequate to extend from pit floor to top of hoistway, with spans in accordance with requirements of authority having jurisdiction and final layouts.
5. Removable barricades at all hoistway openings, in compliance with OSHA 29 CFR 1926.502 in addition to any local code requirements.
6. Lifeline attachments capable of withstanding 5000 lb load in accordance with OSHA 29 CFR 1926.502. Provide a minimum of 2 at the top, front of each hoistway.
7. Pit lighting: Fixture with switch and guards. Provide illumination level equal to or greater than that required by ASME A17.1/CSA B44 2000, or applicable version.
8. Control space lighting with switch. Coordinate switch with lighting for machine space as allowable by code.
9. Access Doors: As required for access to governor and/or seismic switch. Access door shall be self-closing, self-locking if necessary and operable from the inside without a key.

D. Related sections:
1. Section 015000 – Temporary Facility and Controls
2. Section 033000 - Cast-in-Place Concrete:
4. Section 055000 - Metal Fabrications
6. Section 230000 - Heating, Ventilating, and Air Conditioning
7. Section 260000 - Electrical
8. Section 263000 - Electric Power Generating and Storing Equipment
9. Section 273000 - Voice Communications
10. Section 283100 - Fire Detection and Alarm
11. Section 310000 – Earthwork

E. Industry and government standards:
1. ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities
2. ADAAG - Accessibility Guidelines for Buildings and Facilities
3. ANSI/NFPA 70, National Electrical Code
4. ANSI/NFPA 80, Standard for Fire Doors and Fire Windows

5. ASME/ANSI A17.1, Safety Code for Elevators and Escalators.
6. CAN/CSA C22.1, Canadian Electrical Code
7. CAN/CSA-B44, Safety Code for Elevators and Escalators

1.2 DESCRIPTION OF ELEVATOR

A. Elevator Equipment:
1. Kone MonoSpace® 500 DX gearless traction elevator
2. Otis
3. Schindler
4. TKE

B. Equipment Control: KCM831

C. Drive: Regenerative

D. Quantity of Elevators: Simplex

E. Landings:
1. Base Bid: 3
2. Alternate No. 1: 4
3. Alternate No. 2: 5

F. Openings: 5 Front Openings, 0 Back Openings

G. Travel:46 ft 0 in

H. Rated Capacity:4000 lb

I. Rated Speed:200 fpm

J. Clear Inside Dimensions: (W x D)90.8in x 66.7in

K. Cab Height:8 ft

L. Entrance Width and Type:48 in

M. Entrance Height:7 ft

N. Main Power Supply: 480 Volts + 5%, three-phase

O. Operation:Simplex

P. Machine Location: Inside the hoistway mounted on car guide rail

Q. Control Space Location: Integrated Control Solution (ICS)

R. Elevator Equipment shall conform to the requirements of seismic zone: No

S. Maintenance Service Period: 12 Months

1.3 PERFORMANCE REQUIREMENTS

A. Car Performance
   1. Car Speed ± 5% of contract speed under any loading condition or direction of travel.
   2. Car Capacity: Safely lower, stop and hold (per code) up to 125% of rated load.

B. System Performance
   1. Vertical Vibration (maximum): 25.4 mg (at 150/200/350 FPM), 15.4 mg (at 500/700 FPM) ISO187338/ISO 8041 system pk-pk
   2. Horizontal Vibration (maximum): 16.1 mg ISO187338/ISO 8041 system pk – pk
   3. Jerk Rate (maximum): 1.3 ft/sec3
   4. Acceleration (maximum): 1.3 ft/sec2
   5. In Car Noise: 55 dB(A) Maximum
   6. Leveling Accuracy: ±0.2 inches
   7. Starts per hour (maximum): 240

1.4 SUBMITTALS

A. Comply with Section 01 33 00 - Submittal Procedures.

B. Product Data: Submit manufacturer's product literature for each proposed system.
   1. Cab design, dimensions and layout.
   2. Layout, finishes, and accessories and available options.
   3. Controls, signals and operating system.
   4. Color selection charts for cab and entrances.

C. Shop Drawings:
   1. Clearances and travel of car.
   2. Clear inside hoistway and pit dimensions.
   3. Location and layout of equipment and signals.
   4. Car, guide rails, buffers and other components in hoistway.
   5. Maximum rail bracket spacing.
   6. Maximum loads imposed on building structure.
   7. Hoist beam requirements.
   8. Location and sizes of access doors.
   9. Location and details of hoistway door and frames.
   10. Electrical characteristics and connection requirements.

D. Operation and maintenance data:
   1. Provide manufacturer's standard maintenance and operation manual.

E. Diagnostic Tools
   1. Prior to seeking final acceptance for the completed project as specified by the Contract Documents, the Elevator Contractor shall deliver to the Owner any specialized tool(s) that may be required to perform diagnostic evaluations, adjustments, and/or parametric software changes and/or test and inspections on any piece of control or monitoring equipment installed.

      This shall include any specialized tool(s) required for monitoring, inspection and/or maintenance where the means of suspension other than conventional wire ropes are furnished and installed by the Elevator Contractor. Any and all such tool(s) shall become property of the Owner. Any diagnostic tool provided to the Owner by the Elevator Contractor shall be configured to perform all levels of diagnostics, systems

adjustment and parametric software changes which are available to the Elevator Contractor.

In those cases where diagnostic tools provided to the Owner require periodic recalibration/or re-initiation, the Elevator Contractor shall perform such tasks at no additional cost to the Owner for a period equal to the term of the maintenance agreement from the date of final acceptance of the competed project During those intervals in which the Owner might find it necessary to surrender a diagnostic tool for re-calibration, re-initiation, or repair, the Elevator Contractor shall provide a temporary replacement for the tool at no additional cost to the Owner.

The Elevator Contractor shall deliver to the Owner, printed instructions for the proper use of any tool that may be necessary to perform diagnostic evaluations, system adjustment, and/or parametric software changes on any unit of microprocessor-based elevator control equipment and means of suspension other than standard elevator steel cables furnished and install by the Elevator Contractor. Accompanying the printed instructions shall be any and all access codes, password, or other proprietary information that is necessary to interface with the microprocessor-control equipment.

1.5 QUALITY ASSURANCE

A. Manufacturer: Minimum of fifteen years' experience in the fabrication, installation and service of elevators of the type and performance of the specified. The manufacturer shall have a documented quality assurance program.

B. Installer: The equipment manufacturer shall install the elevator.

C. Inspection and Testing: In accordance with requirements of local jurisdiction, obtain required permits, inspections and tests.

1.6 DELIVERY, STORAGE AND HANDLING

A. If the construction site is not prepared to receive the elevator equipment at the agreed ship date, the General Contractor shall be responsible for the cost of storage at an approved facility. Additional labor costs for double handling will be the responsibility of the General Contractor.

B. Delivered elevator materials shall be stored in a protected environment in accordance with manufacturer recommendations. A minimum storage area of 10 feet by 20 feet is required adjacent to the hoistway.

1.7 WARRANTY

A. Provide manufacturer warranty for a period of one year. The warranty period is to begin upon final acceptance of the Contract. Warranty covers defects in materials and workmanship. Damage due to ordinary use, vandalism, improper or insufficient maintenance, misuse, or neglect do not constitute defective material or workmanship.

1.8 MAINTENANCE SERVICE

A. The elevator manufacturer shall provide maintenance service consisting of regular

examinations and adjustments of the elevator equipment for a period of 12 months after date of substantial completion. Replacement parts shall be produced by the original equipment manufacturer.

B. Maintenance service be performed during regular working hours of regular working days and shall include regular time call back service.

C. Maintenance service shall not include adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents.

PART 2: PRODUCTS

2.1 MANUFACTURER

A. Provide AC gearless machine room-less elevator systems subject to compliance with the design and performance requirements of this specification. Elevator manufacturers may include but are not limited to one of the following:
   1. Basis of Design: MonoSpace® 500 DX traction elevators by KONE, Inc.(www.kone.us)
   2. Other acceptable machine room-less products: manufacturer with minimum 15 years' experience in manufacturing, installing, and servicing elevators of the type required for the project. Other acceptable overhead machine products: manufacturer with minimum 15 years' experience in manufacturing, installing, and servicing elevators of the type required for the project.

2.2 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE

A. Controller: Provide microcomputer-based control system to perform all functions.
   1. All high voltage (110V or above) contact points inside the controller cabinet shall be protected from accidental contact in a situation where the controller doors are open.
   2. Controller shall be separated into two distinct halves; Motor Drive side and Control side. High voltage motor power conductors shall be routed and physically segregated from the rest of the controller.
   3. Provide a serial cardrack and main CPU board containing a non- erasable EPROM and operating system firmware.
   4. Variable field parameters and adjustments shall be contained in a non- volatile memory module.

B. Drive: Provide Variable Voltage Variable Frequency AC drive system to develop high starting torque with low starting current.

C. Controller Location: Locate controller{s} in the front wall integrated with the top landing entrance frame, machine side of the elevator. One non-fused three phase permanent power in hoist way at top landing. A separate control space should not be required.

2.3 EQUIPMENT: HOISTWAY COMPONENTS

A. Machine: AC gearless machine, with permanent magnet synchronous motor, direct current electro-mechanical disc brakes and integral traction drive sheave, mounted to the car guide rail at the top of the hoistway

B. Hoisting: Elevator must utilize traditional steel hoist cables that do not require a monitoring device.

C. Governor: Friction type over-speed governor rated for the duty of the elevator specified.

D. Buffers, Car and Counterweight: Polyurethane buffer.200

E. Hoistway Operating Devices:
   1. Emergency stop switch in the pit
   2. Terminal stopping switches.
   3. Emergency stop switch on the machine

F. Positioning System: System consisting of magnets and proximity switches.

G. Guide Rails and Attachments: Steel rails with brackets and fasteners.

2.4 EQUIPMENT: HOISTWAY ENTRANCES

A. Hoistway Entrances
   1. Sills: Aluminum Extruded
   2. Doors: Hollow metal construction with vertical internal channel reinforcements.
   3. Fire Rating: Entrance and doors shall be UL fire-rated for 1-1/2 hour.
   4. Entrance Finish:#4 Brushed Stainless
   5. Entrance Markings Jamb Plates: Provide standard entrance jamb tactile markings on both jambs, at all floors. Plate Mounting: Refer to manufacturer drawings.

2.5 EQUIPMENT: CAR COMPONENTS

A. Car Frame: Provide car frame with adequate bracing to support the platform and car enclosure.

B. Car Safeties: Device will be provided and mounted under the car platform, securely bolted to the Car Frame. The safety will be actuated by a centrifugal governor mounted at the top of the hoistway. The Safety is designed to operate in case the car attains excessive descending speed.

C. Platform: Platform shall be all steel construction.

D. Car Guides: Provide guide-shoes mounted to top and bottom of both car and counterweight frame. Each guide-shoe assembly shall be arranged to maintain constant contact on the rail surfaces. Provide retainers in areas with Seismic design requirements.

E. Cab Finish: Industrial Chic, 42005

F. Car Wall Finish:
   1. Walls: 5WL rigidized stainless steel panels, No. 4 satin finish.
   2. Car front, Door and Skirting: #4 Brushed Stainless Steel
   3. Ceiling: Direct lighting,round LED (CL80)
   4. Handrails: Round, straight ends (HR61)
      a. Rails to be located on Handrail on car wall C of car enclosure.
   56. Sills: Aluminum extruded.

G. Flooring: Terrazzo. See Section 096623 - Terrazzo Flooring.

H. Emergency Car Signals
1. Emergency Siren: Siren mounted on top of cab that is activated when the alarm button in the car operating panel is engaged. Siren shall have rated sound pressure level of 80 dB(A) at a distance of three feet from device. Siren shall respond with a delay of not more than one second after activation of alarm button.
2. Emergency Car Lighting: Provide emergency power unit employing a 12- volt sealed rechargeable battery and totally static circuits shall illuminate the elevator car and provide current to the alarm bell in the event of building power failure.
3. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.

I. Ventilation: Manufacturer's standard cab fan

2.6 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

A. Car Operating Panel: Provide car operating panel with all push buttons, key switches, and message indicators for elevator operation. Fixture finish to be#4 Brushed Stainless Steel
1. Main Flush mounted car operating panel shall contain a bank of round, mechanical, illuminated buttons marked to correspond to landings served, emergency call button, door open button, door close button, and key switches for lights, inspection, and exhaust fan. Buttons Amber have illumination (halo). All buttons to have raised text and Braille marking on left hand side. The car operating display panel shall be Amber. All texts, when illuminated, shall be Amber. The car operating panel shall have a #4 Brushed Stainless Steel finish.
2. Additional features of car operating panel shall include:
a. Car Position Indicator within operating panel#4 Brushed Stainless Steel
b. Elevator Data Plate marked with elevator capacity and car number on car top
c. Help buttons with raised markings.
d. In car stop switch per local code.
e. Call Cancel Button.

B. Hall Fixtures: Wall mounted hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Wall mounted hall fixtures shall have a #4 Brushed Stainless Steel finish

C. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel, and a chime will sound. The chime will sound once for up and twice for down. The car riding lantern face plate shall have a #4 Brushed Stainless Steel finish.

D. Combination Hall Position indicator and Hall lantern located at None.

2.7 EQUIPMENT: ELEVATOR OPERATION AND CONTROLLER

A. Elevator Operation
1. Simplex Collective Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.
2. 24/7 Connected Services: Real-time monitoring that utilizes IoT and Artificial

Intelligence to predict service needs which may cause downtime. 24/7 Connected Services enhances equipment reliability, safety, and operational and maintenance efficiency.

3. Zoned car parking
4. Relative System Response Dispatching.

B. Standard Operating Features to include:
1. Full Collective Operation
2. Fan and Light Control.
3. Load Weighing Bypass.
4. Ascending Car Uncontrolled Movement Protection
5. Top of Car Inspection Station.

C. Additional Operating Features to include:
1. Independent Service.
2. Hoistway Access Bottom Landing.
3. Hoistway Access Top Landing.
4. Emergency Hospital Service.
5. Emergency Video Communication, if required by code. The display provided is enabled with a cloud-based streaming service during the warranty maintenance period.

D. Elevator Control System for Inspections and Emergency
1. Provide devices within controller to run the elevator in inspection operation.
2. Provide devices on car top to run the elevator in inspection operation.
3. Provide within controller an emergency stop switch to disconnect power from the brake and prevents motor from running.
4. Provide the means from the controller to mechanically lift and control the elevator brake to safely bring car to nearest available landing when power is interrupted.
5. Provide the means from the controller to reset the governor over speed switch and also trip the governor.
6. Provide the means from the controller to reset the emergency brake when set because of an unintended car movement or ascending car over speed.
7. Provide the means for the control to reset elevator earthquake operation.

2.8 EQUIPMENT: DOOR OPERATOR AND CONTROL

A. Door Operator: A closed loop permanent magnet VVVF high-performance door operator shall be provided to open and close the car and hoistway doors simultaneously. Door movement shall be cushioned at both limits of travel. Electro-mechanical interlock shall be provided at each hoistway entrance to prevent operation of the elevator unless all doors are closed and locked. An electric contact shall be provided on the car at each car entrance to prevent the operation of the elevator unless the car door is closed.

B. The door operator shall be arranged so that, in case of interruption or failure of electric power, the doors can be readily opened by hand from within the car, in accordance with applicable code. Emergency devices and keys for opening doors from the landing shall be provided as required by local code.

C. Doors shall open automatically when the car has arrived at or is leveling at the respective landings. Doors shall close after a predetermined time interval or immediately upon pressing of a car button. A door open button shall be provided in the car. Momentary pressing of this

button shall reopen the doors and reset the time interval.

D. Door hangers and tracks shall be provided for each car and hoistway door. Tracks shall be contoured to match the hanger sheaves. The hangers shall be designed for power operation with provisions for vertical and lateral adjustment. Hanger sheaves shall have polyurethane tires and pre-lubricated sealed-for-life bearings.

E. Electronic Door Safety Device. The elevator car shall be equipped with an electronic protective device extending the full height of the car. When activated, this sensor shall prevent the doors from closing or cause them to stop and reopen if they are in the process of closing. The doors shall remain open as long as the flow of traffic continues and shall close shortly after the last person passes through the door opening.

PART 3: EXECUTION

3.1 EXAMINATION

A. Field measure and examine substrates, supports, and other conditions under which elevator work is to be performed.

B. Do not proceed with work until unsatisfactory conditions are corrected.

C. Prior to start of work, verify hoistway is in accordance with shop drawings. Dimensional tolerance of hoistway from shop drawings: -0 inches +2 inches. Do not begin work of this section until dimensions are within tolerances.

D. Prior to start of work, verify projections greater than two inches (four inches if ASME A17.1/CSA B44 2000 applies) must be beveled not less than 75 degrees from horizontal.

E. Prior to start of work, verify landings have been prepared for entrance sill installation. Traditional sill angle or concrete sill support shall not be required.

F. Prior to start of work, verify elevator pit has been constructed in accordance with requirements, is dry and reinforced to sustain vertical forces, as indicated in approved submittal. Verify that sumps or sump pumps located within pit will not interfere with installed elevator equipment.

G. Prior to start of work, verify control space has been constructed in accordance with requirements, with access coordinated with elevator shop drawings, including sleeves and penetrations.

H. Verify installation of GFCI protected 20-amp in pit and adjacent to each signal control cabinet in control space.

3.2 PREPARATION

A. Coordinate installation of anchors, bearing plates, brackets and other related accessories.

3.3 INSTALLATION

A. Install equipment, guides, controls, car and accessories in accordance with manufacturer installation methods and recommended practices.

B. Properly locate guide rails and related supports at locations in accordance with manufacturer's recommendations and approved shop drawings. Anchor to building structure using isolation system to minimize transmission of vibration to structure.

C. All hoistway frames shall be securely fastened to fixing angles mounted in the hoistway. Coordinate installation of sills and frames with other trades.

D. Lubricate operating system components in accordance with manufacturer recommendations.

E. Perform final adjustments, and necessary service prior to final acceptance.

3.4 CONSTRUCTION

A. Interface with Other Work:
   1. Guide rail brackets attached to steel shall be installed prior to application of fireproofing.
   2. Coordinate construction of entrance walls with installation of door frames and sills. Maintain front wall opening until elevator equipment has been installed.
   3. Ensure adequate support for entrance attachment points at all landings.
   4. Coordinate wall openings for hall push buttons, signal fixtures and sleeves. Each elevator requires sleeves within the hoistway wall.
   5. Coordinate emergency power transfer switch and power change pending signals as required for termination at the primary elevator signal control cabinet in each group.
   6. Coordinate interface of elevators and fire alarm system.
   7. Coordinate interface of dedicated telephone line.
   8. Coordinate the installation of the non-fused three phase permanent power disconnect in hoist way at top landing

3.5 TESTING AND INSPECTIONS

A. Perform recommended and required testing in accordance with authority having jurisdiction

B. Obtain required permits and provide originals to Owner's Representative.

3.6 DEMONSTRATION

A. Prior to final acceptance, instruct Owner's Representative on the proper function and required daily maintenance of elevators. Instruct personnel on emergency procedures.

END OF SECTION 142100

DIVISION 17

SPECIAL SYSTEMS

DIVISION 21

FIRE SUPPRESSION

SECTION 21 00 00

FIRE PROTECTION SYSTEM

PART 1 GENERAL

1.1 WORK INCLUDED:

A. The General Conditions of the Contract and Supplementary Conditions of the Contract shall govern the work under this Section of the Specifications. The Contractor is specifically directed to refer to said conditions.

B. It is understood that these specifications, and the accompanying drawings, complement complete apparatus, fully erected and in successful operating condition. All work must be preformed in the best and most substantial manner.

C. These specifications are intended to provide complete, and in proper operation, all sprinkler system piping, equipment, heads, valves, controls, air compressor, and accessories, all as specified herein or shown on the accompanying drawings, or reasonably implied in either. The building shall be provided with complete coverage sprinkler system for the spaces designated on the drawings classification as required. System shall consist of a calculated dry system unless indicated otherwise. Verify all pertinent criteria. The systems shall conform to layout shown and meet all requirements of agencies listed under "REGULATIONS AND STANDARDS" below. Refer to plans and specifications for additional information.

D. Pipe, fittings, valves, and connections for fire protection and sprinkler systems shall be furnished by fire protection contractor.

1.2 RELATED WORK:

A. Section 21 13 14 - Dry-pipe Sprinkler Systems.

1.3 SYSTEM LAYOUT:

A. Where plans indicate layout of system components, the layout shall be verified to comply with "REGULATIONS AND STANDARDS" and shall be revised if required to comply. The location of the sprinkler system piping and components shall be coordinated with all other trades. Revisions to sprinkler system layout shall be at Sprinkler Contractor's expense. Any such revisions shall be verified with the Architect.

1.4 ELECTRICAL WORK:

A. See "COORDINATION".

1.5 SPRINKLER SYSTEM CONTRACTOR:

A. It is intended that the work under this section is to be preformed by a qualified Fire Protection Piping Systems Contractor regularly engaged in this type of work. The Contractor is to hold a

current license to perform this work and be certified by the State Fire Marshall. All documents shall bear this certification.

1.6 REGULATIONS, STANDARDS AND REFERENCES:

A. It is the intention of these specifications and the accompanying drawings, that all elements and features of the fire protection system shall be in accordance with the standards of the National Fire Association (NFPA), the State Fire Marshall, all applicable building codes and Property Insurance Association of Louisiana whether so indicated or not. NFPA standards are on file in office of Engineer and may be examined at the Contractor's request.

B. ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings, Class 150.

C. ANSI/ASME B16.3 - Malleable Iron Threaded Fittings, Class 150. Interior of building.

D. Specifications for Qualification of Welding Procedures and Welders for Piping and Tubing.

E. NFPA 13 - Installation of Sprinkler Systems.

F. NFPA 14 - Standpipe and Hose Systems.

1.7 QUALITY ASSURANCE:

A. Conform to NFPA 13 for sprinkler systems.

B. Conform to NFPA 14 for standpipe hose systems.

C. Welding Materials and Procedures: Conform to ASME Code.

D. Employ certified welders in accordance with ANSI/ASME Section 9. AWS D10.9.

E. Valves: Bear UL FM label or marking. Provide manufacturer's name and pressure rating marked on valve body.

1.8 SUBMITTALS:

A. Submit product data under provisions of section 01 30 00 - Administrative Requirements

B. Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals.

C. Indicate valve data and ratings.

1.9 DELIVERY, STORAGE, AND HANDLING:

A. Deliver and store valves in shipping containers, with labeling in place, under provisions of Section 016000– Product Requirements.

B. Provide temporary protective coating on cast iron and steel valves.

C. Provide temporary end caps and closures. Maintain in place until installation.

1.10 AREAS SUBJECT TO FREEZING:

A. For areas requiring protection and not receiving direct heating during times of potential freezing, such as building overhangs, porches, canopies, attics, etc. provide a compressed air dry pipe system for these areas only, see drawings for locations. Coordinate electrical requirements with contractor.

1.11 MANUFACTURER'S OR TRADE NAMES:

A. Where the plans or specifications mention the names of manufacturers or the products of specific manufacturers, it is intended that the Contractor shall furnish the item or items as specifies. Products of manufacturers that are not mentioned shall be subject to prior review by the Engineer and shall in any case mentioned shall be subject to prior review by the Engineer and shall in any case be in accordance with regulations and standards as state above.

1.12 SHOP DRAWINGS AND SUBMITTAL DATA:

A. Within fifteen (15) days of award of the contract, the contractor shall submit six (6) copies of system piping shop drawings and six (6) copies of manufacturer's data and descriptive literature and drawings for all equipment and materials. Additionally, provide a reproducible (sepia) copy of the system piping shop drawings. All drawings, literature and data on all equipment shall be submitted at the same time; this material shall contain complete layout, capacity data, dimensions and other pertinent information necessary for the Architect to properly review and evaluate the item that necessary to meet the requirements for submittal to the State Fire Marshall.

B. The contractor shall obtain approval of agencies listed under "REGULATIONS AND STANDARDS" before submitting to the Engineer, except that the date for State Fire Marshall's review shall be submitted to the Engineer prior submitting to the Fire Marshall. All required review fees and applicable requirements shall be by the contractor. No item of equipment or material shall be place on order until Final Review comments have been received from the Architect. See "DRAWINGS" below.

1.13 ORDINANCES, RULES AND REGULATIONS:

A. All material and construction shall conform to the requirements of all building, plumbing and sanitary codes and laws in force in the locality in which the work is to be done. All materials and construction shall also conform to the rules and regulations listed above under "REGULATIONS AND STANDARDS".

1.14 DRAWINGS:

A. The contractor shall submit detailed drawings for all sprinkler system showing exact locations and sizes of all elements in the system before fabrication is begun. Engineer shall have the prerogative of changing the position or configuration of these systems without changing the total scope of work involved to comply with "REGULATIONS AND STANDARDS".

1.15 GUARANTEE:

A. The contractor shall guarantee all materials and workmanship under this contract for a period of one (1) year from date of final acceptance of his work and shall repair or replace any such defective materials and workmanship without cost to the Owner.

B. The guarantee shall include complete service, including adjustment service and inspection, during the guarantee period as required by agencies listed under "REGULATIONS AND STANDARDS".

1.16 APPROVAL OF PRODUCT PRIOR TO BIDDING

A. Refer to Instructions to Bidders

PART 2 PRODUCTS

2.1 PIPE AND TUBE:

A. See Section – 21 13 13 Wet-pipe Sprinkler System

B. Underground pipe shall be C900 to within 5' of building.

C. Section 21 13 14 – Dry-Pipe Sprinkler System

2.2 PIPE FITTINGS:

A. Steel Fittings: ANSI/ASME B16.9, wrought steel, butt welded. ANSI/ASME B16.25, buttweld ends. ASTM A234, wrought carbon steel and alloy steel. ANSI/ASME B16.5, steel flanges and fittings. ANSI/ASME B16.11, forges steel socket welded and threaded.

B. Cast Iron Fittings: ANSI/ASME B16.1, flanges and fittings. B16.4, screwed fittings.

C. Malleable Iron Fittings: ANSI/ASME B16.3, screwed type. ANSI/ASTM A47.

2.3 JOINT MATERIALS:

A. Solder: ANSI/ASTM B32, 95/5 alloy.

B. Brazing: ANSI/AWS A5.8.

C. Threaded Joint Compound.

2.4 UNIONS, FLANGES, AND COUPLINGS:

A. Unions: 150 psi malleable iron for threaded ferrous piping.

B. Flanges: 150 psi forges steel slip-on flanges for ferrous piping.

2.5 ACCEPTABLE MANUFACTURER - GATE VALVES:

A. Nibco 637-31

B. Central 722 U Series

C. Substitutions: Under provisions of Instructions To Bidders.

2.6 GATE VALVES:

A. Bronze, rising stem, inside screw, solid wedge.

2.7 ACCEPTABLE MANUFACTURERS - GLOBE OR ANGLE VALVES:

A. Nibco GS-132-U

B. Crane 143

C. Substitutions: Under provisions of Instructions To Bidders.

2.8 GLOBE OR ANGLE VALVES:

A. Bronze, rising stem, inside screw, renewable composition disc.

2.9 ACCEPTABLE MANUFACTURERS - CHECK VALVES:

A. NIBCO CS-172

B. Crane 147

C. Substitutions: Under provisions of Instructions To Bidders.

2.10 CHECK VALVES:

A. Iron body, bronze trim, swing disc, renewable disc and seat.

2.11 ACCEPTABLE MANUFACTURERS - BUTTERFLY VALVES:

A. Nibco LD 3510-2 Series

B. Central Fig. 570 or 580

C. Substitutions: Under provisions of Instructions To Bidders.

2.12 BUTTERFLY VALVES:

A. Iron body, bronze stainless steel disc and stem extended for insulated work, resilient replaceable liner seat.

2.13 ACCEPTABLE MANUFACTURERS - DRAIN VALVES:

A. Nibco F-667-0 Series

B. Central 722 U Series

C. Substitutions: Under provisions of Instructions To Bidders.

2.14 DRAIN VALVES:

A. Brass ball valve with cap and chain, 3/4 inch (19 mm) hose thread.

2.15 VALVE OPERATORS:

A. Provide handwheels for gate, globe or angle, and drain valves.

B. For butterfly valves provide gear operators for sizes 8 inches and larger. For smaller sizes provide level lock handle with toothed plate.

2.16 VALVE CONNECTIONS:

A. Provide valve connections to match pipe joints. Use valves of pipe size.

B. For copper tube, provide threaded solder adapters for connection to valve.

C. Provide butterfly valve with tapped lug body when used for isolating service.

2.17 SIAMESE FIRE DEPARTMENT CONNECTIONS:

A. Provide two-way standard siamese fire department connection with chrome plated finish, local fire department threads, dust caps and chains, 3/4" automatic drip, marked "SPRINKLER - FIRE DEPARTMENT CONNECTION:.

2.18 ACCEPTABLE MANUFACTURERS - SPRINKLER HEADS:

A. Reliable Automatic Sprinkler

B. Viking Corp.

C. Tyco-Fire

D. Substitutions: Under provisions of Instruction To Bidders.

PART 3 INSTALLATION

3.1 GENERAL:

A. Furnish and install in a neat workmanlike manner, all piping shown on drawings or that is specified or required to provide a complete, properly operating installation. All piping and accessories shall conform to standards as applicable.

B. Run piping parallel with the lines of the building, unless specifically shown or noted otherwise. All pipe, fittings, valves, etc., shall have sufficient clearance from other work to finish at least 1/2 inch from other work or finished covering of other piping.

C. Provide all necessary hangers, anchors, thrust blocks, etc., to properly support and protect piping system, as required by agencies listed under "REGULATIONS AND STANDARDS".

D. Under no circumstances is the contractor to attach to or support from any bar joist bridging. Any supports to the bar joists or any structural systems are to be approved by the Architect/Engineer. All supplement angle or channel iron required to support equipment of this Specification is to be furnished by the contractor and is to be independent of any other supports.

3.2 DESIGN:

A. The sprinkler systems shall be designed as required for occupancies specified by experienced personnel have competency in the execution of such work. Sprinkler system design shall be performed only by licensed sprinkler contractors.

B. Sprinkler piping shall be protected from freezing during the lay-a-way period.

C. NFPA rules and regulations governing the design shall be scrupulously adhered to.

D. Piping shall be installed in accordance with NFPA 13.

3.3 EXECUTION:

A. Run piping concealed above furred ceiling and in joists to minimize obstructions. Expose only heads.

B. Coordinate sprinkler piping routing and heads with all trades.

C. Protect sprinkler heads against mechanical injury.

D. Include all costs of shop drawings review and approval from authorities in price.

E. Locate outside alarm on wall of building adjacent to Siamese department connections.

F. Provide cabinet containing required number of spare heads as per NFPA 13, of each type, along with wrench suitable for each type of head.

G. Provide flow switch on leaving side of main valve and monitoring switch on main valve. Flow switch shall sense flow and sound appropriate zone of fire alarm system monitoring switch on each main valve; when valve is started to its "closed" position shall indicate trouble on appropriate zone of fire alarm system and sound local audible alarm. Wiring between flow switches and monitoring switches and fire alarm system shall be provided under the Electrical Division.

H. Furnish and install sprinkler zone valves and flow switches where indicated on the drawings for the zoning of the system. Each of these devices shall be connected into the fire alarm system as indicated for the main valve, including local alarming.

I. Provide all test and drain valves as required per NFPA 13.

J. Support sprinkler piping in accordance with NFPA 13.

K. Provide new water service as shown on the drawings.

L. Install air compressor on vibration isolators, as required.

M. Screw joint steel piping up to and including 1-1/2 inch diameter. Screw or Roll Goove 2 inch diameter and larger. PER NFPA 13.

N. Die cut screw joints with full cut standard taper pipe threads with red lead and linseed oil or other non-toxic joint compound applied to male threads only.

O. Coat threaded ends with pipe lubricant compound.

P. Steel piping, main sized saddle branch connections or direct connection of branch lines to mains is permitted if main is one pipe size larger than the branch for up to 6 inch mains and if main is two pipe sizes larger than branch for 8 inch and larger mains.

Q. Solder Braze copper tubes.

R. Install piping in accordance with NFPA 13 for sprinkler systems and NFPA 14 for standpipe and hose systems.

S. Do not penetrate building structural members unless indicated.

T. Provide sleeves when penetrating footings floors and walls.

U. Seal pipe and sleeve penetration to achieve fire resistance equivalent to fire separation required.

3.4 INSTALLATION - VALVES:

A. Install valves with stems upright or horizontal, not inverted.

B. Provide gate valves for shut-off or isolating service.

C. Where approved, butterfly valves may be used instead of gate valves.

D. Provide drain valves at main shut-off valves, low points of piping and apparatus.

3.5 SLEEVES AND PLATES:

A. Wherever pipes pass through concrete slabs, furnish and install sleeves, properly located for the work.

B. Use sleeves of sufficient size to allow the specified pipe covering to pass through the sleeves and finish sleeves flush with walls and ceiling.

C. Sleeves shall be galvanized steel not lighter than 24 gauge.

D. Seal spaces between sleeve and pipe. Use packing device or material for UL rating to match

rating of wall or floor/ceiling as rated under UL File R9658.

3.6 ESCUTCHEONS:

A. Where pipes passing through floors, walls or ceiling exposed to view in finished areas, provide pressed steel split plates which cover the opening and fit snugly to pipe.

3.7 COORDINATION:

A. All interlock and signal wiring runs to the annunciator panel will be furnished and installed and as part of the Electrical Work.

B. This contractor shall provide for all switches and interlocking devices on all valves as required.

3.8 UNDERGROUND PIPING:

A. Underground fire protection system piping shall be installed in accordance with the requirements of NFPA 24, Private Fire Service Mains and Their Appurtenances. Provide concrete thrust blocking at each change of direction of the piping and at all tees, plugs, and caps in accordance with NFPA 24. Where thrust blocking is impractical, fittings with a mechanical joint retainer gland, approved for the piping material utilized, may be used in lieu of thrust blocking.

END OF SECTION

SECTION 21 13 13

WET-PIPE SPRINKLER SYSTEMS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Revision of existing sprinkler piping & head location for renovated building areas.

B. Installation of new sprinkler and related piping systems in new construction.

1.2 WORK INSTALLED BUT SPECIFIED UNDER OTHER SECTIONS

A. Section Fire Protection Piping: Piping and valves.

1.3 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

A. Furnish sleeves to General Contractor.

1.4 RELATED WORK

A. Section 23 05 29 - Supports and Anchors.

1.5 REFERENCES:

A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volt maximum).

B. NFPA 13 - Installation of Sprinkler Systems.

1.6 SYSTEM DESCRIPTION:

A. System to provide coverage for entire new building area.

B. Interface system with building control system. Building fire and smoke alarm system.

C. Provide system per NFPA 13 hazard requirement.

1.7 QUALITY ASSURANCE:

A. Design and installation to conform to NFPA 13.

B. Equipment and components: Bear UL FM label or marking.

C. Specialist Firm: Company specializing and licensed in sprinkler systems.

1.8 REGULATORY REQUIREMENTS:

A. Hydraulic Calculations, Product Data, Shop Drawings: Bear stamp of approval of Fire Marshal.

B. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, components and accessories.

C. Submit shop drawings product data hydraulic calculations to Fire Marshal. Submit proof of approval to Architect. Include check for review fee with submittal to Fire Marshal's office.

1.9 PROJECT RECORD DOCUMENTS:

A. Submit documents under provisions of Section 01 78 39.

1.10 OPERATION AND MAINTENANCE DATA:

A. Submit manufacturer's operation and maintenance data under provisions of Section 01 78 23.

B. Include written maintenance data on components of system, servicing requirements, and record drawings.

C. Include maintenance, inspection data, replacement part numbers and availability, and location and numbers of service depot.

1.11 DELIVERY, STORAGE, AND HANDLING:

A. Deliver and store materials in shipping containers with labeling place under provisions of Section 01 60 00.

B. Provide suitable wrenches for each head type.

C. Maintain caps in place until installation.

1.12 EXTRA STOCK:

A. Provide extra sprinkler heads under provisions of NFPA 13.

B. Provide suitable wrenches for each head type.

C. Provide storage cabinet, size and type as per NFPA-13

PART 2 PRODUCTS

2.1 PIPING MATERIALS:

A. Above Ground Inside Building Piping: Pipe diameter smaller than and up to 2" shall be Steel Schedule 40 pipe, Pipe diameters 2-1/2" and larger shall be Steel Schedule 10 or Steel Schedule 40 pipe, As permitted by NFPA 13.

2.2 ACCEPTABLE MANUFACTURERS - SPRINKLER HEADS:

A. Reliable Automatic Sprinkler

B. Viking Corp.

C. Tyco-Fire

D. Substitutions: Under provisions of Instruction To Bidders.

2.3 SPRINKLER HEADS:

A. Exposed Area Type: Standard upright type with brass finish.

B. Sidewall Type: Brass Chrome plated finish with matching escutcheon.

C. Fusible Link: Temperature rated for specific area hazard.

D. Guards: finish to match sprinkler head.

E. Finished ceilings: Pendent sprinklers - concealed type with white cover plates. Unless otherwise noted on plans.

PART 3 EXECUTION

3.1 PREPARATION:

A. Place pipe runs to minimize obstruction to other work.

3.2 INSTALLATION:

A. Run piping concealed above furred ceiling and in joists to minimize obstructions. Expose only heads.

B. Coordinate sprinkler piping routing and heads with all trades.

C. Protect sprinkler heads against mechanical injury.

D. Include all costs of shop drawings review and approval from authorities in price.

E. Locate outside alarm on wall of building adjacent to siamese fire department connections.

F. Provide cabinet containing required number of spare heads as per NFPA 13, of each type, along with wrench suitable for each type of head.

G. Provide flow switch on leaving side of main valve and monitoring switch on main valve. Flow switch shall sense flow and sound appropriate zone of fire alarm system monitoring switch on each main valve; when valve is started to its "closed" position shall indicate trouble on appropriate zone of fire alarm system and sound local audible alarm. Wiring between flow switches and monitoring switches and fire alarm system shall be provided under electrical division.

H. Furnish and install sprinkler zone valves and flow switches where indicated on the drawings for

the zoning of the system. Each of these devices shall be connected into the fire alarm system as indicated for the main valve, including local alarming.

I. Provide all test and drain valves as required for system per NFPA 13.

J. Support sprinkler piping in accordance with NFPA 13.

K. Provide new water service as shown on the drawings.

3.3 CLEANING:

A. Flush entire piping system of foreign matter.

3.4 SYSTEM TESTS:

A. Hydrostatically test entire system.

B. Test shall be witnessed by Fire Marshal and Architect.

END OF SECTION

SECTION 21 13 14

DRY-PIPE SPRINKLER SYSTEMS

PART 1 GENERAL

1.1 WORK INCLUDED:

A. All Areas subject to temperatures below 40 deg F.

B. Area specifically shown on plans.

1.2 WORK INSTALLED BUT SPECIFIED UNDER OTHER SECTIONS

A. Section 21 00 00 - Fire Protection Piping: Piping and valves.

1.3 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS:

A. Furnish sleeves to General Contractor.

1.4 RELATED WORK:

A. Section 23 05 29 - Supports and Anchors.

B. Section 23 05 48 - Vibration Isolation.

1.5 REFERENCES:

A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volt maximum).

B. NFPA 13 - Installation of Sprinkler Systems.

1.6 SYSTEM DESCRIPTION:

A. System to provide coverage for areas subject to temperatures below 40 deg F.

B. Interface system with building control system. Building fire and smoke alarm system.

C. Provide system per NFPA 13 hazard requirement.

1.7 QUALITY ASSURANCE:

A. Design and installation to conform to NFPA 13.

B. Equipment and components: Bear UL FM label or marking.

C. Specialist Firm: Company specializing and licensed in sprinkler systems.

1.8 REGULATORY REQUIREMENTS:

A. Hydraulic Calculations, Product Data, Shop Drawings: Bear stamp of approval of Fire Marshal.

B. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, components and accessories.

C. Submit shop drawings product data hydraulic calculations to Fire Marshal. Submit proof of approval to Architect. Include check for review fee with submittal to Fire Marshal's office.

1.9 PROJECT RECORD DOCUMENTS:

A. Submit documents under provisions of Section 01 70 00.

1.10 OPERATION AND MAINTENANCE DATA:

A. Submit manufacturer's operation and maintenance data under provisions of Section 01 70 00.

B. Include written maintenance data on components of system, servicing requirements, and record drawings.

C. Include maintenance, inspection data, replacement part numbers and availability, and location and numbers of service depot.

1.11 DELIVERY, STORAGE, AND HANDLING:

A. Deliver and store materials in shipping containers with labeling place under provisions of Section 01 60 00.

B. Provide suitable wrenches for each head type.

C. Maintain caps in place until installation.

1.12 EXTRA STOCK:

A. Provide extra sprinkler heads under provisions of NFPA 13 and Section 01 70 00.

B. Provide suitable wrenches for each head type.

C. Provide metal storage cabinet.

PART 2 PRODUCTS

2.1 PIPING MATERIALS:

A. Above Ground Inside Building Piping: shall all be Steel Schedule 40 pipe. At the contractors discretion 2-1/2" and larger can be Steel Galvanized Schedule 10.

B. Above Ground Exposed Piping: shall be Steel Galvanized Schedule 40 pipe. At the contractors discretion 2-1/2" and larger can be Steel Galvanized Schedule 10.

2.2 ACCEPTABLE MANUFACTURERS - SPRINKLER HEADS:

A. Reliable Automatic Sprinkler

B. Viking Corp.

C. Tyco-Fire

D. Substitutions: Under provisions of Instruction To Bidders, Page IB-3, Paragraph 4.3.

2.3 SPRINKLER HEADS:

A. Exposed Area Type: Standard upright type with brass finish.

B. Sidewall Type: Brass Chrome plated finish with matching escutcheon.

C. Fusible Link: Temperature rated for specific area hazard.

D. Guards: finish to match sprinkler head.

E. Finished ceilings: Pendent sprinklers - concealed type with white cover plates. Unless otherwise noted on plans.

2.4 AIR COMPRESSOR:

A. Air compressor serving the dry pipe sprinkler system shall be base mounted tank high volume type, single or duplex unit, electric motor driven, ASME rated horizontal receiver tank, air pressure operated electric switch, motor, motor starter, safety valves, check valves, automatic tank drain, muffler filter, belt guard, and controls capable of required free air delivery from 0 to 40 psig within 30 minutes of start. See plans for location.

PART 3 EXECUTION

3.1 PREPARATION:

A. Place pipe runs to minimize obstruction to other work.

3.2 INSTALLATION:

A. Run piping concealed above furred ceiling and in joists to minimize obstructions. Expose only heads. Unless noted on plans.

B. Coordinate sprinkler piping routing and heads with all trades.

C. Protect sprinkler heads against mechanical injury.

D. Include all costs of shop drawings review and approval from authorities in price.

E. Locate outside alarm on wall of building adjacent to siamese fire department connections.

F. Provide cabinet containing required number of spare heads as per NFPA 13, of each type, along with wrench suitable for each type of head.

G. Provide flow/pressure switch on leaving side of main valve and monitoring switch on main valve. Flow switch shall sense flow and sound appropriate zone of fire alarm system monitoring switch on each main valve; when valve is started to its "closed" position shall indicate trouble on appropriate zone of fire alarm system and sound local audible alarm. Wiring between flow switches and monitoring switches and fire alarm system shall be provided under Division 26.

H. Furnish and install sprinkler zone valves and flow switches where indicated on the drawings for the zoning of the system. Each of these devices shall be connected into the fire alarm system as indicated for the main valve, including local alarming.

I. Provide all test and drain valves as required for system per NFPA 13.

J. Support sprinkler piping in accordance with NFPA 13.

K. Provide new water service as shown on the drawings.

3.3 CLEANING:

A. Flush entire piping system of foreign matter.

3.4 SYSTEM TESTS:

A. Hydrostatically test entire system.

B. Test shall be witnessed by Fire Marshal and Architect.

END OF SECTION

SECTION 21 30 00

FIRE PUMP

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fire pump and controller.

B. Jockey pump.

1.2 RELATED WORK

A. Section 21 00 00 - Fire Protection System

B. Section 21 13 13 - Wet-Pipe Sprinkler System

C. Section 21 13 16 - Dry-Pipe Sprinkler System

1.3 REFERENCES

A. NFPA Pamphlet 20.

1.4 QUALITY ASSURANCE

A. Fire pump, jockey pumps and controller shall be by one manufacturer and shall be listed by Underwriters Laboratories, and approved by Factory Mutual Fire Insurance Companies.

B. Acceptable Manufacturers

1.5 SUBMITTAL

A. Aurora

B. Peerless

C. Submit product data under provisions of Section 01 30 00 - Administrative Requirements.

1.6 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data.

1.7 APPROVAL OF PRODUCT PRIOR TO BIDDING

A. Refer to Section 01 60 00 – Product Requirements, Material and Equipment for product prior approval requirements.

PART 2 PRODUCTS

2.1 FIRE PUMP

A. Furnish and install a complete fire pump system with pump, driver, controller, jockey pump and all accessories. The fire pump shall meet all requirements of NFPA and be fully approved by Factory Mutual Fire Insurance Company. 750 GPM

B. The fire pump shall be a horizontal, base mounted, split case, single stage, double suction centrifugal type.

C. The driver shall be a horizontal, foot mounted, open drip-proof, ball bearing type, AC, induction, squirrel cage motor 75 HP, 460/3ph/60, 120 psi. The motor shall be of such capacity that 115% of the full load ampere rating shall not be exceeded at any pump load for U.L. listed fire pump systems. Locked rotor current shall not exceed the values listed in NFPA 20.

D. Pump and motor shall be mounted on a common base plate.

E. Impellers shall be enclosed type, cast bronze. Impellers shall be dynamically balanced, keyed to shaft and held in place with thread shaft sleeves. Pump shaft shall be made of SAE 1045 steel or equal. All pumps where the suction is expected 40 psi or below shall be provided with lantern ring connected to pressure side of the pump.

F. The fire pump unit shall be provided with the following accessories:
1. Eccentric tapered suction reducer.
2. Concentric tapered discharge increaser.
3. Hose valves.
4. Caps and chains.
5. Hose valve header.
6. Pressure gauges.
7. Circulation relief valve.
8. Automatic air release valve.
9. Coupling guard.

2.2 FIRE PUMP CONTROLLER

A. The fire pump controller shall be U.L. listed and FM approved. It shall be completely assembled and wired and tested at factory. The controller shall be locked as not to be water damaged and shall be of the combination manual/automatic type. The controller shall be primary resistor type complete with the following accessories:
1. Disconnect switch and auto transfer switch.
2. Circuit breaker - time delay type with trips in all phases set for 300% of motor full load current interrupting capacity - 100,000.
3. Motor starter.
4. Pressure switch.
5. Running period timer.
6. Pilot light.
7. Ammeter.
8. Alarm relay with audible alarm.
9. Manual selection station marked "automatic" - "non-automatic".
10. Means shall be provided on the controller to operate an alarm signal continuously

while pump is running.

11. All control equipment shall meet requirements of NFPA 20.
12. Tests: The pump and electric motor shall be shop tested and meet NFPA 20, the pump shall be given a complete performance test with positive suction pressure. A certified performance curve shall be prepared and submitted. Pumps shall also be hydrostatically tested to twice shut-off head. The pump manufacturer shall assume unit responsibility and shall provide the services of a factory trained representative to supervise and/or be available to conduct final field test.

2.3 JOCKEY PUMP

A. Furnish and install where indicated on drawings an in-line close coupled jockey pump.

B. Pump shall have the following capacities: 10 GPM, at 140psi, 3 HP, 3500 RPM, 480/3ph/60.

C. Acceptable Manufacturers
   1. Aurora
   2. Grundfos

END OF SECTION

DIVISION 22

PLUMBING

SECTION 22 10 00

PLUMBING PIPING

PART 1 GENERAL

1.1 WORK INCLUDED

A. Pipe and Pipe Fittings

B. Valves

C. Storm Sewer Piping System

D. Domestic Water Piping system

E. Service Connections

1.2 RELATED WORK

A. Section 23 00 00 - General Provisions

B. Section 23 05 29 - Supports and Anchors

C. Section 23 07 00 - Piping Insulation

D. Section 22 10 10 - Plumbing Specialties

E. Section 22 40 00 - Plumbing Fixtures and Trim

1.3 REFERENCES:

A. ANSI/ASME B16.3 - Malleable Iron Threaded Fittings Class 150 NS 300.

B. ANSI/ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV.

C. ANSI/ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV.

D. ANSI/ASME Sec. 9 - Welding and Brazing Qualifications.

E. ANSI/ASTM B32 - Solder Metal.

F. ANSI/ASTM C443 - Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.

G. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.

H. ASTM A74 - Cast Iron Soil Pipe and Fittings.

I. ASTM A234 - Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.

J. ASTM B88 - Seamless Copper Water Tube.

K. ASTM B306 - Copper Drainage Tube (DWV).

L. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.

M. AWS A5.8 - Brazing Filler Metal.

N. AWWA C601 - Standard Methods for the Examination of Water and Waste Water.

O. CISPI 301 - Cast Iron Soil Pipe and Fittings for Hubless Cast Iron Sanitary System.

P. CISPI 310 – Standard for cast iron couplings

Q. LSPC – The latest addition of the Louisiana State Plumbing Code.

1.4 QUALITY ASSURANCE:

A. Valves: Manufacturer's name and pressure rating market on valve body.

B. Welding Materials and Procedures: Conform to ASME Code and applicable state labor regulations.

C. Welders Certification: In accordance with ANSI/ASME Sec. 9. ANSI/AWS D 1.1.

D. Cast iron pipe and fittings shall be marked with CISPI's collective trademark.

1.5 SUBMITTALS:

A. Submit shop drawings and product data under provisions of Section 01 30 00.

B. Include data on pipe material, pipe fittings, valves and accessories.

1.6 WATER PIPE AND FITTING MATERIALS STANDARD

A. Plastic Water Pipe and Fittings
   1. ABS and PVC Plastic Tubular Fittings: ASTM F 409, ANSI/NSF 24, ANSI/NSF 14
   2. Joints for IPS PVC pipe using solvent cement: ASTM D 2672
   3. Chlorinated poly (vinyl chloride) (CPVC) plastic pipe, Schedule 80, 2" and under: ASTM F 441, listed
   4. Chlorinated poly (vinyl chloride) (CPVC) plastic pipe (SDR-PR): ASTM F 442
   5. CPVC Pipe and fittings: ASTM D 2846, Listed
   6. Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) pressure pipe and fittings: ASTM F 1281
   7. Cross-linked Polyethylene (PEX) plastic hot and cold water distribution system: ASTM F 877, Listed

8. Cross-linked Polyethylene (PEX) tubing: ASTM F 876
9. Cross-linked Polyethylene (PEX) tubing systems for pressure: CAN/CSA-B137.5M89, listed
10. Flexible Elastomeric pressure joints: ASTM D 3139, See 308.8
11. Metal insert fittings for PB tubing: ASTM F 1380
12. Polyethylene/Aluminum/Polyethylene (PE-AL-PE) pressure pipe and fittings: ASTM F 1282
13. Polyethylene pipe and tubing (PE) Number 2305, 2306, 3306, 3406, 3408: ASTM D 2104, ASTM D 2239, ASTM D 2737, Listed, See 303.8.2
14. Poly (vinyl chloride) (PVC) plastic pipe fittings, Schedule 40: ASTM D 2466
15. Pressure rated ABS-fittings: ASTM D 2468, Listed
16. Pressure rated ABS-pipe Number 1210, 2112, 1316: ASTM D 1527, ASTM D 2282, Listed, See 303.8.2
17. PVC injection molded gasketed fittings for pressure applications: CAN/CSA-B137.2-M89, Listed
18. PVC Pipe, Number 1120, 1220: ASTM D 1785, ASTM D 2241, listed, See 303.8.2
19. PVC socket-type fittings, Schedule 80: ASTM D 2467, listed
20. Socket-type chlorinated poly (vinyl chloride) (CPVC) plastic pipe fittings, Schedule 80, 2" and under: ASTM F 439, listed
21. Threaded chlorinated poly (vinyl chloride) (CPVC) plastic pipe fittings, Schedule 80, 2" and under: ASTM F 437, listed

B. Ferrous Water Pipe and Fittings
1. Cast Iron fittings (threaded): ASTM A 126
2. Cast iron pipe (threaded): ANSI A40.5
3. Cast iron water pipe: ASTM A377
4. Ductile-iron water pipe: ANSI/AWWA C 151/A 21.51
5. Ductile-iron water fittings: ANSI/AWWA C 110/A 21.10
6. Malleable iron fittings (threaded): ASTM A 197
7. Nipples pipe (threaded): FS WW-N-351a
8. Stainless steel water pipe Grade H: ASTM A 268, See 303.8.4
9. Steel couplings, threaded, black and galvanized: ASTM A 865
10. Steel pipe black and galvanized: ASTM A 53
11. Welded and seamless steel pipe: ASTM A 53

C. NonFerrous Pipe and Fittings
1. Cast bronze fittings for flared copper tube: ANSI B16.26
2. Cast bronze threaded fittings: ASME B16.15
3. Cast bronze solder-joint pressure fittings: ANSI B16.18
4. Cast copper alloy fittings for flared copper tubes: ASME B 16.26
5. Pipe flanges and flanged fittings: ANSI B16.5
6. Seamless brass tube: ASTM B 135
7. Seamless copper pipe: ASTM B 42
8. Seamless copper tube: ASTM B 75
9. Seamless copper water tube types K, L, & M: ASTM B 88
10. Seamless red brass pipe: ASTM B 43
11. Seamless and welded copper distribution tube (type D): ASTM B 641
12. Threadless copper pipe (TP): ASTM B 302
13. Welded brass tube: ASTM B 587

14. Welded copper tube: ASTM B 447
15. Welded copper alloy UNS # C21000 water tube: ASTM B 642
16. Wrought copper and copper-alloy solder-joint pressure fittings: ASME B 16.22 for copper water tube
17. Wrought seamless copper and rectangular copper-alloy pipe and tube: ASTM B 251, square and tubing not applicable
18. Valves-flanged threaded, and welding end: ANSI B 16.34

D. Backflow Prevention Devices Materials Standard
1. Air gap standards: ASME A112.1.2
2. Backflow preventers, double check valve assembly: ASSE 1015, ANSI/AWWA C510
3. Backflow preventers with intermediate atmospheric vent: ANSI/ASSE 1012
4. Backflow preventers, double check detector assembly: ANSI/ASSE 1048
5. Backflow preventers, hose connection: ANSI/ASSE 1052
6. Backflow preventers, reduced pressure detector assembly: ANSI/ASSE 1047
7. Backflow preventers, reduced pressure principle assembly: ANSI/AWWA C511, ASSE 1013
8. Dual check valve type backflow preventer: ASSE 1032, for carbonated beverage dispensers-post mix type
9. Field test procedures for backflow preventer assemblies: ASSE 5010
10. Manual for the selection, installation, maintenance, and field testing of backflow prevention devices: CAN/CSA B64.10
11. Vacuum breakers, Anti-Siphon, pressure type assembly (outdoor use): ASSE 1020
12. Vacuum breakers-atmospheric pipe applied: ANSI/ASSE 1001
13. Vacuum breakers, back siphonage, pressure type assembly (spill resistant): ANSI/ASSE 1056
14. Vacuum breakers, hose connections: ANSI/ASSE 1011
15. Vacuum breakers, laboratory faucet: ANSI/ASSE 1035
16. Vacuum breaker wall hydrants, fronts resistant automatic draining: ASSE 1019
17. Water closet flush tank fill valves (ballcocks): ASSE 1002

E. Valves Material Standards
1. Valves, bronze gate: MSS SP-80
2. Valves, cast iron gate: ASTM A 126
3. Valves, ball: MSS SP-72, MSS SP-110
4. Valves, resilient-seated gate: ANSI/AWWA C509

F. Temperature Control Device Standards
1. Individual shower control valves, anti-scald: ASSE 1016
2. Temperature actuated mixing valves for primary domestic use: ASSE 1017
3. Water supply valves, mixing valves and single control mixing valves: ASSE 1029

G. Potable Water Piping
1. All potable water pipes, pipe related products, and materials that join of seal pipes conform to ANSI/NSF 61.

1.7 DRAINAGE SYSTEM MATERIALS STANDARDS

A. NonMetallic Piping

1. Concrete drain tile: ASTM C 412
2. Concrete perforated: ASTM C 444
3. Concrete reinforced culverts: ASTM C 76, for storm drains only
4. Concrete reinforced sewer pipe: ASTM C 361, for storm drains only
5. Concrete sewer pipe: ASTM C 14, for storm drains only
6. Sewer manholes: ASTM C 478
7. Concrete (steel cylinder type): FS SS-P-381

B. Plastic Pipe and Fittings
1. Coextruded composite pipe: ASTM F 1488, See 303.8.3, 303.8.5, 704.1, 1101.5, 1103.2, 1103.4
2. Coextruded composite drain, waste, and vent pipe (DWV): ASTM F 1499, See 303.8.3, 303.8.5, 704.1, 1101.5, 1103.2, 1103.4
3. Coextruded PVC plastic pipe: ASTM F 891, See 303.8.3, 303.8.5, 704.1, 1101.5, 1103.2, 1103.4
4. Flexible elastomeric non-pressure joints: ASTM D 3212, See 303.8
5. Large diameter ribbed PVC sewer pipe and fittings: CAN/CSA-B182.4
6. Polyolefin laboratory drainage systems: CAN/CSA-B181.3
7. PVC-DWV pipe and fittings: ASTM D 2665, listed, See 303.8.3
8. Type PS 46 and type PS 115 sewer pipe (for outside building sewers, storm drains): ASTM F 789, See 704.1, 1101.4, 1103.2, 1103.4, ASTM D 2321, installation
9. Type PSM PVC sewer pipe and fittings (for outside building sewers, storm drains, and storm sewers): ASTM 3034, See 704.1, 1101.5, 1103.2, 1103.4, ASTM D 2321, installation
10. Type PSP PVC sewer pipe and fittings (for outside building sewers, storm drains, and storm sewers): ASTM D 2321, Installation
11. All plastic piping pipes, plastic plumbing piping components and related materials shall be listed as conforming with ANSI/NSF Standard 14.

C. Ferrous Pipe and Fittings
1. Cast iron soil pipe and fittings: ASTM A 74, CISPI HS
2. CI NO-HUB pipe and fittings: ASTM A 888, CISPI Std. 301
3. Ductile-iron gravity sewer pipe: ASTM A 746
4. Hubless cast iron sanitary system: CISPI Std. 310
5. Manhole top frames and covers: ASTM A 48

D. NonFerrous Pipe and Fittings
1. Cast copper alloy solder-joint drainage fittings: ASME B 16.23, for plumbing drainage waste and vents
2. Cast copper alloy solder-joint fittings for solvent drainage systems: ANSI B 16.32
3. Copper drainage tube DWV: ASTM B 306
4. Welded copper and copper alloy heat exchanger tube: ASTM B 543
5. Wrought copper and wrought copper alloy solder-joint drainage fittings for plumbing drainage waste and vents: ASME B 16.29
6. Wrought copper and wrought copper alloy solder-joint fittings for solvent drainage systems: ANSI B 16.43

E. Glass pipe
1. Borosilicate glass pipe and fittings for DWV applications: ASTM C 1053

PART 2 PRODUCTS

2.1 STORM SEWER PIPING - BURIED BEYOND 5 FEET OF BUILDING:

A. Schedule 40 PVC/DWV
Fittings: Same as piping
Joints: Solvent welded

2.2 STORM SEWER PIPING - BURIED WITHIN 5 FEET OF BUILDING:

A. Schedule 40 PVC/DWV
Fittings: Same as piping
Joints: Solvent welded

2.3 STORM SEWER PIPING, ABOVE GRADE:

A. Schedule 40 PVC/DWV
Fittings: Same as piping
Joints: Solvent welded

2.4 WATER PIPING, ABOVE GRADE: Exterior water piping buried beyond 5' of building to be schedule 40 PVC.

A. Copper Tubing: ASTM B88, Type L, hard drawn.
Fittings: ANSI/ASME B16.18, cast bronze solder-joint pressure fittings, or ANSI/ASME B16.22, wrought copper.

B. All potable water pipes, pipe related products and materials that join or seal pipes and pipe related products shall be evaluated and listed as conforming with a national consensus product or material standard and ANSI/NSF Standard 61.

2.5 WATER PIPING, UNDER SLAB

A. Soft Copper Tube: ASTM B 88, Types K and L, water tube, annealed temper.

2.6 FLANGES, UNION, AND COUPLINGS:

A. Pipe Size two (2) Inches and Under: 150 psig malleable iron unions for threaded ferrous piping; bronze unions for copper pipe, solder joints.

B. Pipe Size Over two (2) Inches: 150 psig forged steel slip-on flanges for ferrous piping; bronze flanges for copper piping; neoprene gaskets for gas service.

C. Dielectric Connections: Unions with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.7 GATE VALVES

A. Up to two (2) Inches: Bronze body, non-rising or rising stem and handwheel, inside screw,

single double wedge or disc, solder or threaded ends. Nibco Model 113 Series, Crane Model 438 Series, Powell Model 2700, Hammond 2B 617 or approved equal.

B. Over two (2) Inches: Iron body, bronze trim, non-rising or rising stem and handwheel, OS&Y, single wedge, flanged ends. Red and White 415/421, NIBCO F619/F617, Crane 461/465 1/2 or approved equal.

2.8 GLOBE VALVES:

A. Up to 2 Inches: Bronze body, rising stem and handwheel inside screw, renewable composition disc, solder screwed ends, with backseating capacity. Nibco Model 211 Series, Crane Model 1 Series, Powell Model 150, Hammond 1.413, Red White 211/212 or approved equal.

B. Over 2 Inches: Iron body, bronze trim, rising stem and handwheel, OS&Y, plug-type disc, flanged ends. Red and White Fig 400 or NIBCO F718-B, Crane 351 or approved equal.

2.9 BALL VALVES:

A. Up to 2 Inches: Bronze or stainless steel body, stainless steel ball, teflon seats and stuffing box ring, lever handle and balancing stops, solder threaded ends with union. Nibco Model 580 Series, Crane Model 2330 Series, Red White 5092/5095 or approved equal.

B. Over 2 inches: Cast steel body, chrome plated steel ball teflon seat and stuffing box seals, lever handle or gear drive handwheel for sizes 10 inches and over, flanged.

2.10 BUTTERFLY VALVES:

A. Iron body, bronze disc, resilient replaceable seat for service to 180-degrees F, or lug end butterfly, 10 position over handle or infinite position lever handle with memory stop.

2.11 SWING CHECK VALVES:

A. Up to 2 inches: Bronze 45 degree swing disc, solder or screwed ends. Nibco Model 413 Series, Crane Model 37 Series, Red White 236/237 or approved equal.

B. Over 2 inches: Iron body, bronze trim, 45 degrees swing disc, renewable disc and seat, flanged ends. Red White 435, Nibco F918, Crane 373 or approved equal.

2.12 SPRING LOADED CHECK VALVES:

A. Iron body, bronze trim, spring loaded, bronze disc, wafer.

B. Red White 442, Nibco W920W, Stockham W6-970 or approved equal.

PART 3 EXECUTION

3.1 PREPARATION:

A. Ream pipe and tube ends. Remove burrs. Bevel end Ferrous pipe.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.2 INSTALLATIONS:

A. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

B. Route piping in orderly manner and maintain gradient.

C. Install piping to conserve building space and not interfere with use of space.

D. Group piping whenever practical at common elevations.

E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

F. Provide clearance for installation of insulation and access to valves and fittings.

G. Provide access where valves and fittings are not exposed.

H. Slope water piping and arrange to drain at low points.

I. Establish elevations of buried piping outside the building to insure not less than 3 feet of cover.

J. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

K. Prepare pipe, fittings, supports, and accessories not prefinished, ready for finish painting.

L. Establish invert elevations, slope all drainage piping 4 inches and larger to 1/8 inch per foot minimum. All drainage piping 3 inches and smaller shall be sloped to 1/4 inch per foot minimum.

M. Install bell and spigot pipe with bell end upstream.

N. Install valves with stems upright or horizontal, not inverted.

O. Provide one plug cock wrench for every ten plug cocks sized 2 inches and smaller, minimum of one. Provide one plug cock wrench for each plug cock sized 2-1/2 inches and larger.

P. In pipe 3 – inch nominal diameter of less, cleanouts shall be located at not more than 50ft.intervals

Q. In pipe 4 – inches nominal diameter through 6 inches nominal diameter, cleanouts shall be located at not more than 80ft. intervals

R. Each building drain shall be provided with a cleanout within 6ft. of the junction of the building

drain and building sewer.

3.3 APPLICATION:

A. Grooved mechanical couplings and fasteners not allowed.

B. Install unions downstream of valves and at equipment or apparatus connections.

C. Install brass male adapters each side of valves in copper piped system. Sweat solder adapters to pipe. All joints in potable lines to be lead free.

D. Install gate, ball, butterfly valves for shut-off and to isolate equipment, part of systems, or vertical risers.

E. Install globe, ball, butterfly valves for throttling, bypass, or manual flow control services.

F. Provide spring loaded check valves on discharge of water pumps.

3.4 TEST

A. Upon completion of the domestic water piping system, if shall be tested and proved tight under a water pressure not less than 200 psi. The water used for testing shall be obtained from a potable source of supply. This pressure test shall be performed before the disinfection of the domestic water piping system is started. This test shall conform to the Louisiana State Plumbing Code

B. Upon completion of the storm sewer piping system the contractor shall perform a water test to prove that the system is tight and with out leaks. No section of the piping system shall be tested with less than 10 ft head of water. The pressure shall be kept on the system for a time no less that 1 hour. This test shall conform to the Louisiana State Plumbing Code.

C. Prior to any test, the Contractor shall notify the Architect in writing a minimum of 5 business days, the date and time the test will take place. No exceptions. After the completion of the test but before the building is substantially complete the contractor shall submit a written report with the following information for each test performed.
   1. Project Name
   2. Project Location
   3. Plumbing Contractor Name, Address and Contact Information
   4. Identification of test performed.
   5. Time and Date test was started
   6. Time and Date test was completed.

3.5 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM:

A. Prior to starting work, verify system is complete, flushed and clean.

B. New or repaired potable water systems shall be purged of deleterious matter and disinfected prior to utilization. The method to be followed shall be that prescribed by the health authority or water purveyor having jurisdiction or, in the absence of a prescribed method, the procedure described in either AWWA C651 or AWWA C652, or as described in this section. This

requirement shall apply to "onsite or in-plant" fabrication of a system or to a modular portion of a system.

1. The pipe system shall be flushed with clean, potable water until dirty water does not appear at the points of outlet.
2. The system or part thereof shall be filled with a water/chlorine solution containing not less than 50 parts per million (50 mg/L) of chlorine, and the system or part thereof shall be valved off and allowed to stand for 24 hours; or the system or part thereof shall be filled with a water/chlorine solution containing not less than 200 parts per million (200 mg/L) of chlorine and allowed to stand for 3 hours.
3. Following the required standing time, the system shall be flushed with clean potable water until the chlorine is purged from the system.
4. The procedure shall be repeated where shown by a bacteriological examination that contamination remains present in the system.

C. Prior to the disinfection of the domestic water piping system the contractor shall inform the architect in writing the date and time the disinfection will take place. After the completion of the disinfection of the domestic water piping system but before the building is substantially completed the contractor shall submit a written report with the following information.

1. Project Name
2. Project Location
3. Plumbing Contractors Name, Address, and contact information
4. Chemicals used in the disinfection process.
5. Time and Date disinfection process was started
6. Time and Date disinfection process was completed

3.6 SERVICE CONNECTIONS:

A. Provide new storm sewer services and tie in as shown on plans. Before commencing work check invert elevations required for sewer connections, confirm inverts and insure that these can be properly connected with slope for drainage and cover to avoid freezing. Contractor to tie in existing services as shown on drawings.

B. Tie domestic water into services as shown on drawings. Provide sleeve in wall for service main and support at wall with reinforced concrete bridge. Caulk enlarged sleeve and make watertight with pliable material. Provide 18-gauge galvanized sheet metal sleeve around service main to 6 inches above floor and 6 feet minimum below grade. Size for minimum of 2 inches of loose batt insulation stuffing. Contractor shall utilize and tie in existing water lines as indicated on the drawings.

END OF SECTION

SECTION 22 10 10

PLUMBING SPECIALTIES

PART 1 GENERAL

1.1 WORK INCLUDED

A. Floor drains

B. Trap Primers

C. Cleanouts

D. Backflow preventors

E. Water hammer arrestors

F. Hose bibbs hydrants

1.2 RELATED WORK

A. Section 23 05 29 - Supports and Anchors

B. Section 22 10 00 - Plumbing Piping

1.3 REFERENCES

A. ANSI/ASSE 1012 - Backflow Preventers with immediate Atmospheric Cent.

B. ANSI/ASSE 1011 - Hose Connection Vacuum Breakers.

C. ANSI/ASSE 1013 - Backflow Preventers, Reduced Pressure Principle.

D. ANSI/ASSE 1019 - Wall Hydrants, Frost Proof Automatic Draining Anti-Backflow Types.

E. ANSI A112.21.1 - Roof Drains

F. ANSI A112.26.1 - Water Hammer Arrestors

G. PDI WH-201 Water Hammer Arrestors

1.4 QUALITY ASSURANCE

A. Manufacturer: For each product specified, provide components by same manufacturer throughout.

1.5 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01 30 00.

B. Include component sizes, rough-in requirements, service sizes, and finishes.

PART 2 PRODUCTS

2.1 FLOOR DRAINS

A. Floor Drain (FD): ANSI A112.21.1; lacquered cast iron two piece body with double drainage flange, weep holes, reversible clamping collar, square adjustable nickel- bonze strainer, and trap primer connection; Wade model 1100G, Zurn model Z415s or Smith model 2005.

B. All floor drains installed shall have trap primers.

2.2 TRAP PRIMERS

A. Trap primers shall be PPP, Inc. Prime-Rite 500 with AG-500 air gap fitting. Distribution unit may be used for multiple floor drains. Trap primers shall be installed as per manufacturer recommendations and in strict accordance with the Louisiana Plumbing Code. Elastomeric flexible type trap guards will not be allowed on this project.

2.3 ROOF DRAINS

A. Roof Drains (RD): Duco Cast Iron body with adjustable extension sleeve, reversible collar, combined flashing clamp, under deck clamp, and gravel stop, with cast iron dome. Coordinate outlet with storm sewer piping. Wade model 3000-ADF, Zurn model Z100, or Smith model 1015.

2.4 EMERGENCY ROOF DRAIN

A. Emergency roof drain (ERD): Duco cast iron body with adjustable extension sleeve, 2” high combination membrane flashing clamp/gravel guard with cast iron dome drain. Coordinate outlet size with storm sewer piping. Zurn Z-100, Wade, or Smith.

2.5 FLOOR SINK

A. Floor sink (FS): 12”x12” floor sink with square nickel bronze top, 8” deep, aluminum dome strainer. Zurn Z1901, Wade 9144, or Smith 300.

2.6 CLEANOUTS

A. Exterior Surfaced Areas: As detailed on Plans.

B. Interior Finished Floor Areas: Lacquered cast iron, two piece body with double drainage flange, weep holes, reversible clamping collar, and adjustable nickel- bronze strainer, square with scoriated cover in service areas and square with depressed cover to accept floor finish in finished floor areas; Model W-6000 manufactured by Wade or Model ZN-1400 manufactured by Zurn or 4000 Series manufactured by Smith.

C. Interior Finished Wall Areas: Line type with lacquered cast iron body and round epoxy coated gasketted cover, and round stainless steel access cover secured with machine screw; Model W-8460-R manufactured by Wade or Model ZN-1445-1 manufactured by Zurn or Model 4532 manufactured by Smith.

D. Interior Unfinished Accessible Areas: Caulked or threaded type, provide bolted stack cleanouts on vertical rainwater leaders.

E. Acceptable Manufacturers
   1. Wade 6000
   2. Zurn 1400
   3. Substitutions: Under provisions of Instructions To Bidders.

2.7 BACKFLOW PREVENTERS

A. Pressure Backflow Preventers: ANSI/ASSE 1013; bronze body with bronze and plastic internal parts and Stainless steel springs; two independently operating, spring loaded check valves; diaphragm type differential pressure relief valve located between check valves; third check valve which opens under back pressure in case of diaphragm failure; non-threaded vent outlet; assembled with two gate valves, strainer, and four test cocks.

B. Acceptable Manufacturers
   1. Watts Model 909
   2. Wilkins Model 375
   3. Substitutions: Under provisions of Instructions To Bidders.

2.8 WATER HAMMER ARRESTORS

A. ANSI A112.26.1; sized in accordance with PDI WH-201, pre-charged suitable for operation in temperature range - 100 to 300 degrees F (-73 to 49 Degrees C) and maximum 250 psig (1700 kpa) working pressure.

B. Acceptable Manufactures
   1. Wade Model W-5, W-10, W-20
   2. Zurn Model Z-1700-100, 200, 300
   3. Smith Model 5000
   4. Substitutions: Under provisions of Instructions To Bidders.

PART 3 EXECUTION

3.1 PREPARATION

A. Coordinate cutting forming of roof floor construction to receive drains to required invert elevations.

3.2 INSTALLATION AND APPLICATION

A. Install specialties in accordance with manufacturer's instructions to permit intended

performance.

B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Insure clearance at cleanout for rodding of drainage system.

C. Encase exterior cleanouts in concrete flush with grade.

D. Install water hammer arrestors complete with accessible isolation valve.

E. In pipe 3 – inch nominal diameter of less, cleanouts shall be located at not more than 50ft.intervals

F. In pipe 4 – inches nominal diameter through 6 inches nominal diameter, cleanouts shall be located at not more than 80ft. intervals

G. Each building drain shall be provided with a cleanout within 6ft. of the junction of the building drain and building sewer.

END OF SECTION

DIVISION 23

HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

SECTION 23 00 00

GENERAL MECHANICAL

PART 1 GENERAL CONDITIONS

1.1 WORK INCLUDED

A. The general conditions of the general specifications are made a part of these specifications and apply the same as if attached hereto. The contractor should, before bidding, read and thoroughly understand all general conditions, priority and scheduling.

1.2 SCOPE OF WORK

A. This section calls for the furnishing of labor, materials, equipment, and all the services, and of performing all operations required for the complete mechanical systems as hereinafter specified and/or shown on the accompanying drawings.

1.3 GENERAL REQUIREMENTS

A. Contractor shall install his work to meet the existing conditions as found at buildings and property, and to accommodate work of other trades. This contractor shall be responsible for timely placing of sleeves in forms before concrete is poured. Cooperate with the general contractor and place pipes and ducts in floors, walls, furred spaces, etc., so there will be no delay. Sheet metal or iron pipe sleeves shall be provided for pipes passing through floors, wall or partitions.

B. Contractor shall furnish and properly install materials, devices, equipment, insulation, controls, appurtenances, etc., mentioned in these specifications and/or shown on plans or required to make a complete and satisfactory installation in working order whether fully shown or not.

C. Contractor should visit the site and acquaint himself thoroughly with conditions governing installation of his work.

D. All other plans shall be checked in relation to these plans so that all conditions will be furnished and installed in this contract to provide complete and satisfactory systems.

1.4 LAWS, RULES, REGULATIONS, FEES, ETC.

A. The entire mechanical work shall comply with rules and regulations of the local and state authorities having jurisdiction including the State Fire Marshal and the State Board of Health. All modifications required by the said authorities at any time shall be made by the mechanical contractor without additional charge. In cases where alterations to or deviations from this specification and accompanying plans are required by the authorities, contractor shall report same to the Architect and obtain his approval before work is started.

1.5 DRAWINGS

A. Plans and detail sketches are submitted to limit, explain, and define structural conditions, specified requirements, pipe sizes, and manner of erecting work. Structural or other conditions may require certain deviations from manner of installation shown, and such deviations shall be made as required, but specified sizes and requirements necessary for satisfactory operation shall remain unchanged.

B. It may be necessary to shift or to change routing of ducts and or piping and this shall be done, but such changes must be referred to Architect for approval before proceeding. Extra charges will not be allowed for these changes.

C. Typical details are shown on plans, and in any cases where Contractor is not certain about the method of installation of this work, he shall ask for details, lack of details will not be an excuse for improper installation.

D. Contractor bidding on this portion of the work must be fully experienced in installations of equal size, complexity and quality. In bidding, he acknowledges that he fully understands the scope of the work and design and has the ability, for the contract price to assemble and install the equipment, piping, and ductwork shown or specified, so as to mold same into a satisfactory workable system and arrangement, without responsibility for capacities and sizes set by these documents.

E. Contractor shall recognize that the amount of information and detail that could be provided in Contract Documents is limitless and could extend into every minute detail, step, sequence, and operation to a point where only workmen would be required, without drawing on ability experience, and ingenuity of the Contractor.

1.6 MATERIALS

A. Where directed by the Architect, Contractor shall submit sample for approval before proceeding.

1.7 STANDARDS

A. In general, standards for products and workmanship shall be as described in each individual section.

B. The standards referred to, except as modified in these specifications shall have full force and effect as though printed in these specifications. These standards are not furnished to bidders for the reason that the manufacturers and trades involved are assumed to be familiar with their requirements. The Architect will furnish, upon request, information as to how copies of the standards referred to may be obtained.

C. Notwithstanding any reference in this section of the specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalogue number, such references shall be interpreted as establishing a standard of quality and shall not be construed limiting competition and the Contractor in such cases, may at his option, use any article, device, product, material, fixture, form or type of construction which in the judgment of the Architect, expressed in writing, is equal to that specified.

1.8 MATERIALS SPECIFIED OR SUBSTITUTED (Prior Approvals)

A. Refer to Instructions to Bidders.

1.9 SHOP DRAWINGS

A. Before proceeding with the work, contractor shall make complete shop and working drawings of such apparatus or connections as directed by the Architect and/or hereinafter specified. These drawings shall show construction details and dimensions of each piece of equipment so drawn.

B. Architects approval of shop drawings shall not relieve the Contractor from responsibility of incorrectly figured dimensions or any other errors in these drawings or specified even though approved by the Architect, shall not relieve this Contractor from furnishing and erecting same.

C. Ten (10) sets of prints of shop drawings shall be submitted to Architect for approval. These prints shall be supplied as part of this contract. Submit all shop drawings at the same time or as soon as practical after award of the contract. No separate items will be accepted.

D. Where laws or local regulations provide that certain accessories such as gauges, thermometers, relief valves and parts be installed on equipment, it shall be understood that such accessories shall be furnished if no specific reference to them is made in the specifications.

1.10 CUTTING AND PATCHING

A. All cutting necessary for this work will be done by this Contractor at his own expense, but all patching shall be done by the General Contractor. No beams or joists shall be cut without prior approval of Architect. After initial resurfacing has been done any further cutting, patching or painting shall be done at the expense of this Contractor.

1.11 INTERFERENCES

A. The drawings are generally diagrammatic and this Contractor shall harmonize his work with that of the different trades so that interferences of the different equipment, piping, etc., shall be installed so as to function properly. In the case where interference develops, the Architect is to state which equipment, piping, etc., is to be relocated regardless of which item was first installed.

1.12 EXCAVATION AND BACKFILL

A. This Contractor shall do all excavating required to lay the specified services and after same have been laid, he shall do all backfilling to the satisfaction of all parties concerned and shall cart away from the premises all unnecessary dirt, rubbish, etc., as directed. Backfill shall be well tamped. All backfill shall be done according to the “Compaction And Backfill” section of these specifications.

1.13 SPACE REQUIREMENTS

A. Contractor shall check all plans pertaining to this job so as to be fully aware of the space limitations for all various items of equipment. Equipment is not to be bid on, submitted for preliminary approval nor placed on the job if it is so bulky and large that adequate access for proper maintenance and servicing cannot be achieved in the space provided.

1.14 FOUNDATIONS AND SUPPORTS

A. This contractor shall furnish and install foundations and supports of concrete or steel shapes for equipment requiring same, unless specifically indicated otherwise or specified.

B. All floor mounted mechanical equipment shall be mounted on 4" high concrete housekeeping pad unless specifically shown otherwise on plans. Refer to plans for special requirements for foundations and supports.

1.15 HANGERS, ESCUTCHEONS, ETC.

A. See Section 23 05 29 – Supports and Anchors.

B. Mechanical Contractor shall furnish and install all thimbles, inserts and other requirements necessary for the support of his equipment and piping. Assist and cooperate with other trades in locating and placing these items.

1.16 CEILING AND WALL ACCESS PANEL

A. Factory made access doors and frames, prime coat finish, screw driver latch(s) of suitable size as required.

B. Access panels in rated ceiling to have same rating as ceiling.

C. Where valves, dampers, controls, fire dampers, smoke dampers, and detectors, reheat coils, etc. are concealed in walls or non-accessible ceilings, install factory made access doors and frames.

1.17 DUCTWORK ACCESS PANELS

A. Access panels in ductwork to be double wall type with insulation sandwiched in between, same insulation value as adjacent ductwork.

1.18 SIPHON PREVENTERS

A. Furnish and install approved type siphon preventors on all equipment and fixtures in such a manner as to prevent water being siphoned back into the water supply in the event the water supply is shut off.

1.19 FLAME SPREAD PROPERTIES OF MATERIALS

A. All materials and adhesives used for acoustical linings, jackets and insulation shall comply with requirements of NFPA 90A and 90B and UL guide # 40V.8.15. Products exceeding a flame spread rating of 25, or a smoke developed rating of 50, as determined by ASTM Test Method E-84 are prohibited. Adhesives and sealers shall be fire retardant and fire resistant when dry. Flame proofing treatments which are subject to decomposition, deterioration, or the effects of moisture are prohibited.

1.20 DOMESTIC AND FIRE WATER TIE-IN

A. Contractor shall provide any necessary meters and tap fees for domestic or fire water tie-ins to utility companies. All domestic and fire water taps shall have aboveground reduced pressure back flow preventors near the tie-in point. Coordinate with Engineer exact location.

B. All backflow preventors shall be heat traced and insulated with 1-1/2" fiberglass insulation with water tight aluminum jacket.

1.21 PROTECTION OF EQUIPMENT

A. See individual sections for protection of equipment.

B. This Contractor shall at all times take such precautions as may be necessary to properly protect his equipment from damage. Failure on the part of the Contractor to comply with the above to the entire satisfaction of the Architect will be sufficient cause for the rejection of the particular piece of equipment in question.

1.22 TESTING

A. All pressure lines, unless elsewhere specified, shall be tested under 150# hydrostatic pressure unless rated pressure is less for a minimum of 5 hours. Contractor shall provide valve at farthest point in line to bleed off air and for inspection.

B. Notice shall be given the Architect before tests are made, the test is not to be drawn off pipes and pipes are not to be covered or insulated until filled pipes have been examined and testing approved by the Architect.

C. In case of defects, they shall be made good to the satisfaction of the Architect and work retested. All such work shall be done by the Contractor with no additional expense to the Owner.

D. Contractor shall make any other such tests as may be called for by the Architect, and all other tests so called for elsewhere in these specifications.

1.23 CLEANING AND ADJUSTING

A. Before receiving final approval from the Architect, the Contractor shall clean out all lines; adjust all valves, control equipment and other equipment. Clean all pipe and equipment and leave the entire installation in good working order. All heaters, fans, grilles, controls, etc., shall be adjusted to perform in correct and satisfactory manner, with sequences, etc., as called for in the specifications hereinafter specified and on plans.

1.24 PAINTING

A. Refer to Section 09 90 00 – Painting and Coating and 230553 – Mechanical Identification for painting requirements.

1.25 MOTORS, MOTOR STARTERS AND ELECTRICAL WORK

A. Refer to Section 23 05 13 - Motors.

B. Motors shall be suitable for voltage indicated on the plans, plus or minus 10% and be designed for constant operation at 40 degrees C ambient, 65 degrees C rise for class A, 90 degrees C rise for Class B, etc. Electrical equipment furnished under this contract shall meet standards as set forth by NEMA and NEC requirements. All electrical equipment shall be UL labeled.

1.26 PARTS LIST AND INSTRUCTION MANUAL

A. See individual sections for specific instructions.

B. This Contractor shall deliver to the Architect three (3) copies of printed instructions relating to operating, proper maintenance and repair parts list indicating the various parts by name, number and diagram for each piece of equipment installed. Test and balance report shall also be included in parts list and instruction manual.

C. The shop drawings, parts list, and maintenance and repair instructions shall be neatly bound in a canvas-covered notebook and turned over to the Architect before acceptance of the work.

1.27 GUARANTEE

A. Contractor shall guarantee materials, equipment and workmanship installed and performed under this contract for a period of one (1) year from date of the final completion and official acceptance of the contract.

B. He shall furnish free of charge to the Owner all materials and labor necessary to comply with the above guarantee, which shall be based on defective materials and/or workmanship, and on such basis shall be responsible if a deficiency is found, for any adjustment, replacement, or correction which may be necessary to replace the project to first class condition. This guarantee shall include refrigerant charges, but shall not include the changing of filters.

1.28 RECORD DRAWINGS

A. The Contractor shall maintain a set of record drawings on-site throughout the construction. The record drawings shall reflect accurate dimensional record of all underground, buried, above ceiling, or otherwise concealed work.

B. The Contractor shall maintain these record documents and keep them up-to-date daily.

END OF SECTION

SECTION 23 01 00

MECHANICAL COORDINATION DRAWINGS

PART 1 GENERAL CONDITIONS

1.1 SECTION INCLUDES

A. Coordination Drawings

B. Coordination with Requirements of related sections of the specifications.

1.2 RELATED SECTIONS

A. Refer to Mechanical, Plumbing, and Sprinkler sections.

1.3 COORDINATION DRAWINGS

A. The Contractor shall coordinate work of all various sections having interdependent responsibilities for installing, connecting to, and placing such equipment. All (including, but not limited to, mechanical, plumbing, sprinkler system) necessary offsets, beds, duct size/configurations, crossings/crossovers shall be provided and installed as necessary to integrate within the structural system and the architectural features (ceilings and walls, etc.)

B. Coordination Drawings: The purpose of the coordination drawings is to assure proper forethought and coordination of the subcontractors and their installation and integrating of all systems of the building within the structural framework, architectural ceilings, floors, and walls of the building. The Contractor shall provide coordination drawings prior to the submittal of all system shop drawings. The coordination drawings shall include ductwork and all mechanical HVAC piping and associated items, plumbing verticals and sprinkler piping, chases, and shall indicate sizes of these items and the structural members.

C. The Contractor shall submit the Coordination Drawings to the Architect for the Architect's review no later than one month after the Work has commenced on the project site. The Architect's review is only for assistance to the Contractor and to assure general design intent.

D. The Coordination Drawings shall include, but is not limited to, the following:
   1. Plan drawings for each floor indicating structural member sizes, HVAC components sizes/routes/locations, major electrical conduit grouping/routes, vertical chases/openings, and all other items as necessary to comply with the requirements of 1.03.A and 1.03.B of this section.
   2. Section Drawings through major pathways for systems (such as corridors, if appropriate), and exemplary rooms.
   3. Any and all other drawings, schedules, and information necessary to illustrate the Contractor's understanding of the architectural design intent of the critical ceiling heights, wall locations, and all other design parameters and how they are accommodated upon the Contractor's proposed integration of the Systems noted in the Contract Documents.

E. During construction, the Contractor shall update the Coordination Drawings in a clean, clear, and legible manner for continuous reference by the Design Team. Upon Substantial Completion, the Contractor shall submit the updated Coordination Drawings and Specifications to the Architect to assist the Architect in the preparation of the Record Documents.

F. If the Contractor proceeds prior to the submittal and review of the Coordination Drawings, he does so at his own risk; the Owner will not compensate the Contractor for any revisions necessary for work already in place (that the Architect interprets) to be as a result of conflict of systems layout, planning, and/or coordination.

END OF SECTION

SECTION 23 05 00

BASIC MECHANICAL MATERIALS AND METHODS

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Piping materials and installation instructions common to most piping systems.
   2. Dielectric fittings.
   3. Mechanical sleeve seals.
   4. Sleeves.
   5. Escutcheons.
   6. Grout.
   7. Mechanical demolition.
   8. Equipment installation requirements common to equipment sections.
   9. Concrete bases.
   10. Supports and anchorages.

1.2 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.3 SUBMITTALS

A. Welding certificates.

1.4 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
   1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
   2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. Electrical Characteristics for Mechanical Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

PART 2 PRODUCTS

2.1 PIPE, TUBE, AND FITTINGS

A. Refer to individual Division 23 piping Sections for pipe, tube, and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.2 JOINING MATERIALS

A. Refer to individual Division 23 piping Sections for special joining materials not listed below.

B. Pipe-Flange Gasket Materials: ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.

C. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

E. Brazing Filler Metals: AWS A5.8, BCuP Series or BAg1, unless otherwise indicated.

F. Welding Filler Metals: Comply with AWS D10.12.

G. Solvent Cements for Joining Plastic Piping:
   1. ABS Piping: ASTM D 2235.
   2. CPVC Piping: ASTM F 493.
   3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
   4. PVC to ABS Piping Transition: ASTM D 3138.

2.3 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig (1725-kPa) minimum working pressure at 180 deg F (82 deg C).

D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300-psig (1035- or 2070-kPa) minimum working pressure as required to suit system pressures.

E. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).

F. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).

2.4 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

B. Sealing Elements: NBR interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.

C. Pressure Plates: Carbon steel. Include two for each sealing element.

D. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.5 SLEEVES

A. Galvanized-Steel Sheet: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.

B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.
   1. Underdeck Clamp: Clamping ring with set screws.

E. Molded PVC: Permanent, with nailing flange for attaching to wooden forms.

F. PVC Pipe: ASTM D 1785, Schedule 40.

G. Molded PE: Reusable, PE, tapered-cup shaped, and smooth-outer surface with nailing flange for attaching to wooden forms.

2.6 ESCUTCHEONS

A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.

C. One-Piece, Cast-Brass Type: With set screw.
   1. Finish: Polished chrome-plated and rough brass.

D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
   1. Finish: Polished chrome-plated and rough brass.

2.7 GROUT

A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
   1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
   2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
   3. Packaging: Premixed and factory packaged.

PART 3 EXECUTION

3.1 MECHANICAL DEMOLITION

A. Refer to Division 1 Sections "Cutting and Patching" and "Selective Demolition" for general demolition requirements and procedures.

B. Disconnect, demolish, and remove mechanical systems, equipment, and components indicated to be removed.
   1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
   2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
   3. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
   4. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.
   5. Equipment to Be Removed: Disconnect and cap services and remove equipment.
   6. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
   7. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Install piping according to the following requirements and Division 23 Sections specifying piping systems.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping to permit valve servicing.

G. Install piping at indicated slopes.

H. Install piping free of sags and bends.

I. Install fittings for changes in direction and branch connections.

J. Install piping to allow application of insulation.

K. Select system components with pressure rating equal to or greater than system operating pressure.

L. Install escutcheons for penetrations of walls, ceilings, and floors.

M. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.

N. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
   1. Install steel pipe for sleeves smaller than 6 inches (150 mm) in diameter.
   2. Install cast-iron "wall pipes" for sleeves 6 inches (150 mm) and larger in diameter.
   3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve.

Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

O. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
   1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

P. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 7 Section "Through-Penetration Firestop Systems" for materials.

Q. Verify final equipment locations for roughing-in.

R. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.3 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 15 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.

F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.

H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

I. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
   1. Comply with ASTM F 402, for safe-handling practice of cleaners, primers, and solvent cements.
   2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
   3. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
   4. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
   5. PVC Nonpressure Piping: Join according to ASTM D 2855.
   6. PVC to ABS Nonpressure Transition Fittings: Join according to ASTM D 3138 Appendix.

J. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.

K. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.

L. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
   1. Plain-End Pipe and Fittings: Use butt fusion.
   2. Plain-End Pipe and Socket Fittings: Use socket fusion.

M. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

3.4 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:
   1. Install unions, in piping NPS 2 (DN 50) and smaller, adjacent to each valve and at final connection to each piece of equipment.
   2. Install flanges, in piping NPS 2-1/2 (DN 65) and larger, adjacent to flanged valves and at final connection to each piece of equipment.
   3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
   4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.5 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

C. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

D. Install equipment to allow right of way for piping installed at required slope.

3.6 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
   1. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger in both directions than supported unit.
   2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of the base.
   3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
   4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   5. Install anchor bolts to elevations required for proper attachment to supported equipment.
   6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
   7. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete and reinforcement.

3.7 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Refer to Division 5 Section "Metal Fabrications" for structural steel.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

C. Field Welding: Comply with AWS D1.1.

3.8 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor mechanical materials and equipment.

B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

3.9 GROUTING

A. Mix and install grout for mechanical equipment base bearing surfaces, pump and other equipment base plates, and anchors.

B. Clean surfaces that will come into contact with grout.

C. Provide forms as required for placement of grout.

D. Avoid air entrapment during placement of grout.

E. Place grout, completely filling equipment bases.

F. Place grout on concrete bases and provide smooth bearing surface for equipment.

G. Place grout around anchors.

H. Cure placed grout.

END OF SECTION

SECTION 23 05 29

SUPPORTS AND ANCHORS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Pipe and equipment hangers, supports, and associated anchors.

B. Equipment bases and supports.

C. Sleeves and seals.

D. Flashing and sealing equipment and pipe stacks.

1.2 RELATED WORK

A. Section 23 07 00 - Piping and Equipment Insulation.

B. Section 22 10 00 – Plumbing Piping

1.3 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01 30 00 – Administrative Requirements.

B. Indicate hanger and support framing and attachment methods.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURER'S

A. Fee and Mason

B. Grinnel

2.2 PIPE HANGERS AND SUPPORTS

A. Hangers for pipe sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.

B. Hangers for pipe sizes 2 to 4 inches and cold pipe sizes 6 inches and over: Carbon steel, adjustable, clevis.

C. Multiple or trapeze hangers: Steel channels with welded spacers and hanger rods; cast iron roll and stand for hot pipe sizes 6 inches and over.

D. Vertical Support: Steel riser clamp.

E. Floor support for pipe sizes 4 inches and over: Welded steel bracket and wrought steel clamp; adjustable steel yoke and cast iron roller for hot pipe 6 inches and over.

F. Shields for insulated piping 2 inches and smaller: 18 gauge galvanized steel shield over insulation in 180 degree segments, minimum 12 inches long at pipe support.

G. All hangers to be sized to include insulation.

2.3 HANGER RODS

A. Steel Hanger Rods: Threaded both ends, threaded one end, or continuous threaded.

2.4 INSERTS

A. Inserts: Malleable iron case or galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms, size inserts to suit threaded hanger rods.

2.5 FLASHING

A. Metal Flashing: 26 gauge galvanized steel.

B. Lead Flashing: 5 lb./sq. ft. sheet lead for waterproofing.

C. Caps: Steel, 22 gauge minimum, 16 gauge at fire resistant elements.

2.6 SLEEVES

A. Sleeves for pipes through non-fire rated floors: Form with 18 gauge galvanized steel.

B. Sleeves for pipes through non-fire rated beams, walls, footings, and potentially wet floors: Form with steel pipe or 18 gauge galvanized steel.

2.7 FABRICATION

A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

B. Design hangers without disengagement of supported pipe.

2.8 FINISH

A. Prime coat exposed steel hangers and supports.

B. Protect against galvanic action with dielectric unions for dissimilar metals.

PART 3 EXECUTION

3.1 INSERTS

A. Provide inserts to General Contractor for placement in concrete formwork.

B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.

D. Where concrete slabs form finished ceiling, provide inserts to be flush with slab surface.

E. Where inserts are omitted, drill through concrete slab from below and provide thru-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

3.2 PIPE HANGERS AND SUPPORTS

A. Support horizontal piping as follows:

PIPE SIZE DIAMETER	MAX HANGER SPACING	MIN. HANGER
1-1/2 TO 2 INCH	10' - 0"	3/8"
2-1/2 TO 3 INCH	10' - 0"	1/2"
4 to 6 inch	10' - 0"	5/8"
8 to 12 inch	10' - 0"	7/8"
14 to 20 inch	15' - 0"	1"

B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.

C. Place a hanger within 12 inches of each horizontal elbow.

D. Use hangers with 1-1/2 inch minimum vertical adjustment.

E. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

F. Support riser piping independently of connected horizontal piping.

3.3 EQUIPMENT BASES AND SUPPORTS

A. Provide equipment bases of reinforced concrete as detailed on plans.

B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.

C. Provide rigid anchors for pipes after vibration isolation components are installed.

3.4 FLASHING

A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate

weather or waterproofed walls, floors, and roofs.

END OF SECTION

SECTION 23 07 00

PIPING AND EQUIPMENT INSULATION

PART 1 GENERAL

1.1 WORK INCLUDED

A. Piping Insulation

B. Jackets and Accessories

C. Equipment Insulation

D. Duct Insulation

1.2 RELATED WORK

A. Section 23 31 00 - Ductwork

1.3 REFERENCES

A. ANSI/ASTM C547 - Mineral Fiber Preformed Pipe Insulation

B. ANSI/ASTM C552 - Cellular Glass Block and Pipe Thermal Insulation.

C. ASTM B209 - Aluminum and Aluminum Alloy Sheet and Plate

D. ASTM E845 - Surface Burning Characteristics of Building Materials.

E. NFPA 255 - Surface Burning Characteristics of Building Materials.

F. UL 723 - Surface Burning Characteristics of Building Materials.

1.4 QUALITY ASSURANCE

A. Applicator: Company specializing in application of piping insulation.

B. Materials: Flame spread/fuel contributed/smoke developed rating of 25/50/50 in accordance with ASTM E84, NFPA 255.0, UL 723.

1.5 SUBMITTALS

A. Submit product data for each application as per Section 01 30 00– Administrative Requirements.

B. Submit manufacturer's installation instructions.

PART 2 PRODUCTS

2.1 INSULATION

A. After all work has been tested and found to be leak free and tight, and accepted by the Architect, insulate as follows:

1. All domestic cold piping above ground shall be covered with 1" thick fiberglass, molded type sectional pipe covering complete with FRJ jacket. Sections of pipe covering shall be joined together, the mastic to be buttered on only one of the two adjoining surfaces at both the Longitudinal and circumferential joints so that a complete seal at the joints is obtained. The piping insulation will be secured in place with copper wire spaced not more than 12 on center. All domestic water piping insulation shall be continuous. Contractor shall not cut insulation to fit around structural items. No exceptions.
2. Insulate all horizontal roof drains with 2” thick ¾ lb. density fiberglass insulation with reinforced aluminum vapor barrier. Seal all joints with duct tape.

PART 3 EXECUTION

3.1 PREPARATION

A. Install materials in accordance with manufacturer's instructions.

3.2 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Continue insulation with vapor barrier through penetrations.

C. On insulated piping with vapor barrier, insulate fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.

D. Neatly finish insulation at supports, protrusions, and interruptions.

END OF SECTION

DIVISION 25

INTEGRATED AUTOMATION

DIVISION 26

ELECTRICAL

SECTION 26 01 00

BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SCOPE

A. General:
1. The Work includes furnishing and installing a complete and operational electrical system for the new North Oaks Health parking garage as indicated on the Drawings and specified herein.
2. The Work includes labor, materials, equipment, supervision, permits, testing, programming, utility coordination, temporary services, demolition, connections, accessories, and incidentals required for complete and operational systems.
3. Coordinate electrical work with the Owner, Architect, Engineer, utility company, fire-protection contractor, elevator contractor, mechanical contractor, plumbing contractor, telecommunications provider, fire-alarm vendor, and other affected trades.

B. Demolition:
1. Disconnect and remove existing parking-lot lighting fixtures, poles, foundations, branch-circuit conductors, raceways, controls, pullboxes, and associated electrical equipment that conflict with construction of the new parking garage.
2. Disconnect and remove abandoned electrical equipment, conductors, cables, and raceways within the limits of construction unless specifically indicated to remain.
3. Maintain electrical service to existing facilities that are to remain operational. Provide temporary connections, rerouting, and protection as required.
4. Coordinate the service shutdown and tie-in to the existing pad-mounted utility transformer with Entergy and the Owner. Submit a written outage plan and obtain Owner approval not less than four weeks before the proposed outage.
5. Perform service interruptions during dates and times approved by the Owner. Restore affected systems to normal operation immediately following completion of the tie-in.

C. Electrical Service and Site Work:
1. Coordinate the new electrical service with Entergy. Verify the existing pad-mounted transformer capacity, service voltage, available fault current, metering requirements, point of connection requirements, and outage procedures.
2. Provide secondary service raceways and conductors from the existing pad-mounted transformer to the new 480Y/277 V main distribution panel, including terminations, grounding, metering provisions, warning tape, concrete encasement, and other accessories indicated or required by Entergy.
3. Include utility-company service-connection fees in the Base Bid unless specifically identified as being paid directly by the Owner.
4. Provide underground raceways, pullboxes, handholes, warning tape, grounding, sealing, drainage provisions, and associated site work required to serve the parking garage, generator, site lighting, telecommunications systems, gates, emergency

phones, and other site equipment.

5. Provide load-rated in-ground enclosures suitable for their installed locations.
6. Provide concrete housekeeping pads, equipment pads, pole foundations, generator foundation, curbs, bollards, and equipment-impact protection where indicated. Coordinate reinforcing, anchorage, dimensions, elevations, and structural requirements with the applicable trades.
7. Provide temporary construction power and lighting in accordance with NFPA 70, Article 590. Coordinate temporary service requirements and metering with Entergy.
8. Provide power and fire-alarm monitoring connections for the backflow-preventer hotbox, including heater power, tamper monitoring, supervisory monitoring, disconnecting means, and associated raceways and conductors.
9. Provide site-lighting poles, luminaires, foundations, grounding, controls, branch circuits, underground raceways, conductors, pullboxes, and associated accessories.

D. Emergency and Standby Power:

1. Provide one outdoor diesel engine-generator set including weather- and corrosion-resistant enclosure, controls, starting batteries, battery charger, jacket-water heater, muffler, vibration isolation, remote annunciation, emergency stop station, and required accessories.
2. Provide double-wall fuel storage having not less than 48 hours of usable fuel capacity at the load basis established by the Engineer. Include leak detection, containment monitoring, vents, fill connections, spill-control provisions, fuel-level monitoring, and associated alarms.
3. Provide automatic transfer switches ATS-LS and ATS-OS with ratings, poles, switched-neutral construction, transition type, withstand and closing ratings, controls, accessories, and monitoring points indicated on the Drawings.
4. Provide the fire-pump automatic transfer equipment and associated normal and emergency feeders as indicated. Coordinate the fire-pump power system with the fire-pump controller manufacturer and fire-protection contractor.
5. Provide emergency and standby distribution panels, transformers, feeders, branch circuits, equipment grounding conductors, control wiring, and monitoring connections.
6. Coordinate generator and transfer-switch operation with elevators, fire alarm, fire pump, sump pumps, security systems, heat tracing, lighting, and other connected loads.
7. Perform startup, load-bank testing, automatic transfer testing, fire-pump starting tests, elevator starting tests, and integrated system testing in the presence of the Owner and Engineer.

E. Power Distribution:

1. Provide the main distribution panel, panelboards, transformers, enclosed circuit breakers, safety switches, disconnect switches, surge-protective devices, feeders, branch circuits, grounding, bonding, identification, and associated accessories indicated on the Drawings.
2. Provide receptacles, weather-resistant GFCI receptacles, special-purpose outlets, junction boxes, pull boxes, disconnecting means, equipment connections, and associated branch circuits.
3. Provide power connections and branch circuits for elevators, elevator controls,

elevator cab lighting, elevator pit lighting and receptacles, sump pumps, fire pump, jockey pump, air compressor, unit heaters, heat tracing, motorized gates, signage, security equipment, emergency phones, telecommunications equipment, fire-alarm equipment, and other equipment indicated on the Drawings.

4. Provide power connections and branch circuits for mechanical and plumbing equipment, including disconnecting means, starters, variable-frequency drives, motorized dampers, control transformers, electric actuators, valves, interlocks, heaters, controls, and accessories furnished by other trades.
5. Verify electrical characteristics and connection requirements against approved equipment submittals before rough-in and installation. Notify the Engineer of discrepancies before proceeding.
6. Provide complete grounding and bonding systems for the electrical service, generator, separately derived systems, building steel, equipment, raceways, telecommunications systems, and other systems indicated.
7. Provide short-circuit, protective-device coordination, and arc-flash studies. Submit final protective-device settings and install weather-resistant arc-flash labels before energizing equipment.

F. Lighting and Lighting Controls:
1. Provide parking-garage luminaires, enclosed-room luminaires, building-mounted exterior luminaires, site-lighting luminaires, exit signs, and emergency luminaires indicated on the Drawings.
2. Provide lighting branch circuits, raceways, conductors, junction boxes, supports, controls, relays, contactors, switches, dimmers, occupancy sensors, daylight sensors, photocells, and associated accessories.
3. Provide parking-garage lighting controls complying with the adopted energy code, including occupancy-based reduction, control zoning, perimeter daylight response, scheduled or nighttime operation, and emergency-lighting override.
4. Coordinate control-zone boundaries, sensor locations, programmed light levels, time delays, normal operating sequences, and emergency operating sequences with the Drawings and approved lighting-control submittals.
5. Provide wet-location, corrosion-resistant, impact-resistant luminaires and mounting hardware suitable for open parking decks, ramps, perimeter bays, the top deck, and other locations exposed to condensation, wind-driven rain, washdown, vibration, or physical damage.
6. Test lighting controls and emergency lighting, document programmed settings, and provide Owner training.

G. Telecommunications and Emergency Communications:
1. Provide telecommunications outlet boxes, junction boxes, raceways, pull strings, grounding, supports, sleeves, firestopping, and associated pathway components indicated on the Drawings.
2. Provide two Category 6 cables to each data outlet unless otherwise indicated. Terminate, label, test, and document each cable.
3. Provide a 4-foot by 8-foot by 3/4-inch plywood telecommunications backboard. Apply two coats of white fire-retardant paint to the front, back, and exposed edges.
4. Provide the telecommunications rack, patch panels, cable management, grounding busbars, bonding conductors, fiber enclosures, connectors, and associated

accessories indicated.

5. Provide one 4-inch raceway with fiber-optic cable from the new parking-garage telecommunications rack to the existing adjacent parking-garage MDF. Provide two additional 4-inch spare raceways with pull ropes. Coordinate routing, terminations, strand count, fiber type, and connection requirements with the Owner.
6. Provide in-grade telecommunications pullboxes, innerduct, fiber slack, splice enclosures, labeling, grounding, and associated accessories. Perform optical-loss and OTDR testing of installed fiber.
7. Provide two 1-inch raceways from the telecommunications rack to the motorized-gate telecommunications junction box as indicated.
8. Provide complete emergency-phone and blue-light stations where indicated, including weatherproof and vandal-resistant stations, mounting hardware, signage, ADA-compliant operation, power, communications cabling, surge protection, automatic location identification, call routing, self-test functions, remote monitoring, programming, and acceptance testing.
9. Provide telecommunications cabling or outlets at the fire-alarm control panel only as indicated and as required for approved system monitoring. Coordinate the connection method with the Owner and fire-alarm system provider.

H. Fire-Alarm and Voice-Evacuation System:

1. Provide a new Siemens-compatible fire-alarm control panel serving the new parking garage and network it with the existing adjacent parking-garage Siemens fire-alarm system.
2. Provide voice-evacuation control equipment, amplifiers, remote booster power supplies, network modules, batteries, annunciation, and associated equipment required for a complete system.
3. Verify available capacity, compatibility, software revisions, licenses, network connections, initiating-device circuits, signaling-line circuits, notification-appliance circuits, audio circuits, and supervising-station connections at the existing system before ordering equipment.
4. Provide manual fire-alarm stations at exterior exits and other locations indicated on the fire-alarm drawings.
5. Provide weatherproof speaker/strobes, strobes, and other audible and visible notification appliances throughout the parking garage as indicated. Appliances installed on open decks shall be listed for wet locations and the installed temperature range.
6. Provide smoke detectors at the fire-alarm control panel, voice-evacuation equipment, remote booster power supplies, and other control equipment where required.
7. Provide duct-mounted smoke detectors for air-handling systems having airflow exceeding 2,000 cfm where required by the adopted codes and mechanical-system design.
8. Provide monitor modules and associated wiring for sprinkler-system waterflow switches, valve-tamper switches, dry-pipe low-air switches, pressure switches, backflow-preventer switches, and other fire-protection supervisory devices.
9. Provide monitoring of backflow-preventer hotbox heater power, enclosure tamper switches, low-temperature alarms, and other supervisory points indicated.
10. Provide monitoring of fire-pump run, fire-pump power failure, phase reversal,

controller trouble, and other required fire-pump supervisory conditions.

11. Provide elevator recall, alternate-floor recall, shunt-trip, power-shutdown, and status interfaces. Coordinate device locations, sequences, and testing with the elevator contractor.
12. Provide generator and automatic-transfer-switch alarm and supervisory interfaces where indicated or required by the approved sequence of operations.
13. Provide fire-alarm raceways, wet-location-rated conductors and cables, corrosion-resistant boxes and fittings, surge protection, grounding, supports, labeling, programming, testing, record documents, and Owner training.
14. Do not install exposed fire-alarm cable on open parking decks. Install fire-alarm conductors and cables in approved raceways suitable for wet, corrosive, and physically exposed locations.
15. Coordinate all required shutdowns, programming changes, system impairments, notifications, testing, and restoration of the existing fire-alarm system with the Owner, existing system service provider, supervising station, and authority having jurisdiction.

1.2 GENERAL CONDITIONS

A. The General Conditions and Supplementary General Conditions are a part of this section of these Specifications. The Contractor is cautioned to read and be thoroughly familiar with all provisions of the General Conditions. These conditions shall be complied with in every aspect.

1.3 DEFINITONS:

A. The word "shall" where used, is to be understood, as mandatory and the word "should" as advisory. "May" is used in the permissive sense.

B. Concealed: Concealed areas are those areas that cannot be seen by building occupants.

C. Exposed: Exposed areas are all areas that are exposed to view by building occupants, including areas below counter tops, inside cabinets and closets, inside all equipment rooms, and areas outside the building exterior envelope.

D. Feeder: Feeder consists of both conduit and wiring installed above or below grade

E. Provide: Provide shall including furnishing, installing, and connecting the item or items referenced unless specifically indicated otherwise.

1.4 QUALITY ASSURANCE

A. General:
1. Every effort has been made by the Engineer to clearly indicate all devices/equipment requiring an electrical/data connection. It is the intent of the Engineer that all light fixtures be powered and controlled, that all devices and equipment be circuited to a panelboard of appropriate voltage and breaker of MOCP not exceeding manufacturer’s specifications. That all communications, security, and fire alarm devices are installed, wiring, and functioning properly.

2. Where there is a conflict between the contract document and an applicable Code. The Code shall govern except where the requirements of the contract documents are more stringent. The most stringent requirement shall apply.
3. All work shall be concealed unless specifically noted to be exposed.
4. Coordinate the exact locations of electrical outlets and equipment with building features and equipment as indicated on architectural, structural, mechanical, plumbing, landscape, and food service drawings. Review any/all proposed changes in electrical device/equipment locations with Architect prior to rough-in. Architect may direct relocation of outlets before rough-in, up to ten (10) feet from the position indicated, without additional cost. Remove and relocate outlets placed in unsuitable locations when requested by the Architect, at no additional cost.
5. Resolve, in writing, any code violation discovered in contract documents with the Engineer prior to bidding. After award of the contract, Contactor shall make any correction or addition necessary for compliance with applicable codes at no additional cost.

B. An approved contractor for the work under this division shall be:
1. A licensed electrical contractor in the jurisdiction in which the work shall be performed.
2. Able to furnish evidence of having contracted for and installed not less than three (3) systems of comparable size and type that have served their Owners satisfactorily for no less than three (3) years.

C. All work, materials and equipment shall comply with the latest applicable codes, local ordinances, and UL requirements.

D. Provide new products of manufacturers regularly engaged in production of such equipment. Provide the manufacturer's latest standard design for the type product specified. All new products shall be listed for the use shown on drawings.

E. Equipment shall be delivered with a factory-applied finish so that no additional field painting is required.

F. Equipment shall be selected to conform the building space limitations. Do not provide equipment that cannot meet the arrangement requirements shown on plans. Contractor shall submit room layouts with submitted items shown drawn to scale. Submittals will be rejected without floor plan Drawings showing submitted items.

G. All equipment included in the service and distribution specifications shall be provided by the same manufacturer.

H. Manufacturer names and model numbers are subject to change. Contractor shall verify them with manufacturer's representative prior to ordering any product or equipment.

1.5 GENERAL REQUIREMENTS

A. The Contractor is referred to all of the Drawings for building construction as well as the electrical Drawings.

B. The Contractor shall examine the site and shall verify to his own satisfaction the location of all utilities, and shall adequately inform himself as to their relation to his work before entering into a Contract and he shall base his bid on any conditions, which may be encountered during the progress of the work.

C. The Contractor shall furnish and install properly all materials, devices, equipment, supports, controls, appurtenances, etc., mentioned or required to make complete or satisfactory installations in working order whether shown or not. All electrical equipment shall be connected in accordance with manufacturer's instructions. All work shall be executed in a workmanlike manner and shall present a neat and mechanical appearance when completed.

D. The Contractor shall provide finished to match approved samples; all exposed finishes shall be approved by the Architect. Submit color samples as required.

1.6 APPLICABLE GENERAL CODES AND REGULATIONS

A. All electrical work and equipment, in whole or in part, shall conform to the applicable portions of the following specifications, codes and regulations in effect on that date of invitation for bids, and shall form a part of this specification.

B. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition.

C. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.
1. NFPA 70, National Electrical Code
2. National Fire Codes:
   a. NFPA 70E, Electrical Safety Requirements for Employee Workplaces
   b. NFPA 72, National Fire Alarm Code
   c. NFPA 77, Static Electricity
   d. NFPA 99, Health Care Facilities
   e. NFPA 101, Life Safety Code
   f. NFPA 110, Emergency and Standby Power Systems
3. Occupational Safety and Health Regulations (OSHA).
4. NFPA Standards in effect shall be as listed or adopted by the appropriate authority having jurisdiction.
5. American National Standards Institute (ANSI)
6. Institute of Electrical and Electronics Engineers (IEEE)
7. Local, City and State Codes and Ordinances
8. Regulations and standards of the Electric Utility Company
9. National Electrical Safety Code (NESC)
10. National Electrical Manufacturers Association (NEMA)
11. Insulated Power Cable Engineers Association (IPCEA)
12. International Building Codes (IBC)
13. International Energy Conservation Codes (IECC)

D. Equipment that has been inspected and approved by the Underwriter's Laboratory shall bear its label or appear on its list of approved apparatus.

1.7 DRAWINGS

A. Plans and detail sketches are submitted to limit, explain, and define conditions, specified requirements, conduit sizes, and manner of erecting work. The Contractor is cautioned to field check and verify all existing conditions before bidding, as no extra compensation will be allowed for conditions found different than represented in the construction drawings and/or specifications. Written approval of the Architect shall be obtained prior to any alterations or additions to specified work.

B. Structural or other conditions may require certain modifications from the manner of installation shown, and such deviations are permissible and shall be made as required, but specified sizes and requirements necessary for satisfactory operations shall remain unchanged.

C. The drawings and these specifications are complementary to each other and what is called for by one shall be binding as if called for by both.

D. General arrangement of work is indicated on plans. Due to the small scale of the drawings, offsets, fittings, and boxes required are not all indicated; provide fittings, boxes, etc., as needed in accordance with codes and accepted practices.

1.8 SUPERVISION

A. The Contractor shall personally or through an authorized and competent representative, constantly supervise the work from beginning to completion and final acceptance. So far as possible, he shall keep the same foreman and workmen throughout the project duration.

B. During its progress, the work shall be subject to inspection by representatives of the Architect or Engineer, at which times the Contractor shall furnish required information.

C. It is not the Architect's or Engineer's duty to direct or guarantee the work of the Contractor, but to assist the Owner in obtaining a complete building in accordance with plans, specifications and addenda and to furnish engineering services in accordance with recognized practices.

1.9 PRIOR APPROVALS

A. The Contractor shall base his proposal on materials as specified herein. Any references to a specific manufacturer or trade name is made to establish a standard of quality and to define a type of product and in no way is intended to indicate a preference for a particular manufacturer. It is the intent of these specifications to allow all manufacturers of equipment, products, etc., judged equal to the specified product to bid on a competitive basis.

1.10 MEASUREMENTS

A. The Contractor shall verify all measurements and shall be responsible for the correctness of same, before ordering any materials or doing any work. No extra charge or compensation will be allowed for any differences between the actual measurements and those indicated on the drawings.

1.11 LAWS, PERMITS AND FEES

A. The entire electrical work shall comply with the rules and regulations of the City, Parish, and State, including the State Fire Marshal and State Board of Health, whether so shown on plans or not. The Contractor shall pay fees for permits, inspections, etc., and shall arrange with the inspecting authorities all required inspections.

1.12 SITE INSPECTION

A. The Contractor shall visit the site and familiarize himself with difficulties attendant to the successful execution of the work before bidding. Failure to visit the site shall not relieve the Contractor of the extent or conditions of the work required of him.

1.13 TEMPORARY FACILTIES

A. The Contractor shall provide all temporary power and lighting for construction purposes. Installation of temporary power shall be in accordance with NEC Article 527.

B. Temporary facilities, wire, lights, and devices are the property of the contractor and shall be removed by the Contractor at the completion of the Contract.

PART 2 - PRODUCTS

2.1 MATERIAL AND EQUIPMENT

A. All materials, equipment, and accessories installed under this Contract, whether approved or not, shall be new and shall conform to all rules, codes, etc., as recommended or adopted by the National Association(s) governing the manufacture, rating and testing of such materials, equipment, and accessories.

B. Product Substitutions

1. If item of equipment or device offered as Substitution differs in dimension or configuration from that indicated in the Contract Documents, provide, as part of the substitution submittal, a drawing that shows that the equipment or devices proposed for Substitution can be installed in the space available without interfering with other trades or with access requirements for operations and maintenance in the completed project. Drawings shall be of appropriate scale but shall not be smaller than a scale of 1/4-inch equals one foot.
2. Where substitute equipment or devices requires different arrangement or connections from that indicated in the Contract Documents, install the equipment or devices to operate properly and in accordance with the requirements of the Contract Documents. Make incidental changes necessary in piping, ductwork or wiring which results from the inclusion of the substitute equipment or device without any additional cost to the Owner. Pay all additional costs incurred by other trades in connection with changes required by the inclusion of the substituted equipment or device in the Work.

2.2 SHOP DRAWINGS & SUBMITTALS

A. Shop drawings shall be taken to mean detailed drawings with dimensions, schedules, weights, capacities installation details, and pertinent information that will be needed to describe the material or equipment in detail.
   1. Shop drawings shall be prepared using computerized digital software compatible with AutoDesk's AutoCAD
   2. Submit hardcopy of Shop Drawings in the quantity as required under Division 01. Hardcopies of Shop Drawings shall have each sheet clearly labeled with a unique sheet identification number.
   3. In addition to hardcopies required by Division 01, submit one copy of Shop Drawings in electronic format on Flash Drive. Files contained shall be named to correspond with the sheet names contained in the hardcopy set. Files on shall include both AutoCAD compatible source files and files printed to Portable Document Format (.pdf).

B. Submittals shall be taken to mean catalog cuts, general descriptive information, catalog numbers, and manufacturer's name.

C. Review of submittals or shop drawings shall not remove the responsibility for furnishing materials or equipment of proper dimensions, quantity and quality; nor will such review remove the responsibility for error in the shop drawings or submittals.

D. Assume all costs and liabilities, which may result from the ordering of any material, or equipment prior to the review of the shop drawings or submittals, and no work shall be done until the shop drawings or submittals have been reviewed. In case of correction or rejection, resubmit until such time as they are accepted by the Owner's representative and such procedures will not be cause for delay. After the final review, 6 copies will be supplied if requested.

E. Shop drawings and submittals will be returned unchecked if the specific items proposed are not clearly marked, or if the general Contractor's approval stamp is omitted.

F. Shop drawings, unless mark-ups are very trivial, will not be returned, "No Exception Taken". They will be returned for re-submittal as many times as necessary, however, the Contractor shall be back charged for engineering review time beginning with the second resubmittal. Therefore, the Contractor should make every effort to comply with the requirements of this Project on the first submittal in order to avoid project delays.

G. The Contractor shall submit to the Architect complete descriptive and dimensional data on the following items for review and approval when specified or provided:
   1. Cable Tray
   2. Disconnect Switches
   3. Electrical Contactors
   4. Electrical Controls and Time Switches
   5. Emergency/Standby generator set and transfer switches
   6. Fire Alarm System Panels, Initiation Devices, and Annunciation Devices
   7. Fire Rated Cables and Connectors
   8. Lighting Controls and Occupancy Sensors

9. Lighting Fixtures
10. Panelboards and enclosures
11. Site Lighting Poles and Fixtures
12. Surface Raceways
13. Surge Protection Devices
14. Switchboards
15. Transformers
16. Wiring Devices

PART 3 - METHODS OF INSTALLATIONS

3.1 CONTRACTOR COORDINATION

A. The Drawings are diagrammatic in nature. Cooperate with other trades so the interferences of facilities and equipment will be avoided.

B. Contractor to coordinate with door hardware provider, architect and owner prior to installation of any devices associated with doors to verify door operational requirement, placement of proximity readers, motion sensors, door switches, fire alarm control, magnetic locks, hold open devices, etc..

C. Contractor to coordinate with hospital equipment provider prior to installation of circuits, conduit and boxes for all hospital equipment. Contractor shall refer to hospital equipment shop drawings for installation and rough in requirements. Locations and circuit sizes indicated on the drawings shall be verified with final hospital equipment drawings.

D. Contractor to coordinate with architectural millwork shop drawings prior to rough-in for locations of under counter lighting to be installed in and around millwork. No receptacles shall be installed in an enclosed cabinet unless noted on the drawings. Outlets for refrigerators, microwaves, etc. shall be installed in the space identified on the millwork shop drawings.

E. Contractor shall not penetrate any stair wall assemble with conduit, boxes, cabling and the like, except for items that serve the stairwell.

F. Space allocations for materials, equipment and devices have been made on the basis of present and known future requirements and the dimensions of items of equipment or devices of a particular manufacturer. Verify that all materials, equipment and devices proposed for use on this Project are within the constraints of the allocated space.

G. Coordinate arrangement, mounting, and support of electrical equipment:
   1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
   2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
   3. To allow right of way for piping installed at required slope. So, connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

H. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

I. Coordination Drawings: Prepare drawings showing dimensioned layout for the following:
   1. Penetration and structural opening: Floor plans showing sleeves and formed structural penetrations. Shoe sleeve and formed penetration layout and relationships between structural components and their adjacent building elements, including but not limited to pre-tensioning and post-tensioning members where used.
   2. Reflected Ceiling Plans: ceiling plans, sections, and other necessary details showing dimensioned layouts for equipment located in or on the ceiling plane. Base dimensions on exact dimensions layout for equipment located in or on the ceiling plane. Base dimension on exact dimensions data obtained from product submittals for products to be included in the work. Differentiated between field measurements and assumed dimensions. Include the following items coordinated with each other, based on input form installers the items involved:
      a. Suspended ceiling components
      b. Structural members to which suspension systems for luminaires will be attached.
      c. Perimeter moldings, decorative ceiling elements, and Architectural features.
      d. Luminaries
      e. HVAC Diffusers, Registers, and Grilles
      f. Speakers
      g. Sprinklers
      h. Smoke detectors
      i. Fire alarm notification appliances
      j. Occupancy sensors
      k. Access panels.
      l. Security cameras
      m. Wireless Internet Access Points
      n. Nurse Call Zone and Dome Lights
      o. Patient Telemetry Receivers and Equipment
   3. Electrical Equipment Layouts: Floor plans, elevations, and other necessary details showing dimensioned layouts for spaces containing electrical equipment. Base electrical equipment dimensions on exact dimensioned data obtained from product submittals for products to be included in the Work. Differentiate between field measurements and assumed dimensions. Include the following items coordinated with each other, based on input from installers of the items involved:
      a. Electrical equipment layout and relationships between components and adjacent structural and mechanical elements.
      b. Indication of required working clearances and required area above and around electrical equipment where pipes and ducts are prohibited.
      c. Location of Conduit entry into electrical equipment.
      d. Location of luminaires, sprinkler piping and heads, ducts, and diffusers.
      e. Electrical equipment support locations, type of support, and weight on each support.
      f. Location of structural supports for structure-supported raceways.
      g. For floor mounted equipment: concrete base dimension, outline of equipment, and required clearances.

3.2 OPENINGS, CUTTING AND PATCHING

A. Cut all openings as required for the electrical work. Patching will be done by the various crafts whose work is involved. Furnish and install all necessary sleeves, thimbles, hangers, inserts, etc., at such times and in such a manner as not to delay or interfere with the work of other Contractors. Caulk, flash or otherwise make weatherproof all penetrations through the roof and exterior walls.

B. Where conduit, cable or other items that are provided for under this contract penetrate fire rated walls or floors, the Contractor is to seal around the item to maintain the integrity of the rated system.

3.3 PAINTING

A. Painting shall be performed as described in the painting specifications. No painting will be required by the Contractor except for touch-up of factory finishes on equipment furnished under this contract.

3.4 ACCESSIBILITY AND DEVICE MOUNTING HEIGHTS

A. All electrical devices shall be installed in compliance with the Americans with Disabilities Act (ADA) and local accessibility codes. Typical mounting heights shall be as follows unless noted otherwise on the drawings or required by authority having jurisdiction:

Device Type	Mounting Height (AFF to Center unless noted)
Duplex receptacles (general use)	18″
Data / communication outlets	18″
Above Counter	4” Above countertop
Wall switches / dimmers / occupancy sensors	48″
Thermostats / control panels	48″
Fire alarm pull stations	42″ (to operable part)
Wall mounted Fire alarm horn/strobes	80″ min. to bottom, 96″ max. to top
Exit signs	As required by Life Safety Code, typically above doors with bottom at 80″ min. AFF
Card readers / access controls	48″
Audio/visual devices (TV, monitors, etc.)	Coordinate with architect/owner

3.5 INSTALLATION

A. Housekeeping Pads: All floor and ground mounted electrical equipment - panels, switchboards, motor control centers, transformers, etc. shall be installed with a reinforced concrete housekeeping pad, whether shown on the drawings or not. The pad shall extend 4” above either the finished floor or final grade (as applicable), have 45 degree chamfered edges, and be constructed of 3000psi concrete. The pad shall extend 4” beyond the edge of the respective electrical equipment. Concrete shall have smooth steel trowel finish.

B. Equipment must be leveled and set plumb. Use corrosion resistant mounting hardware. For sheet metal enclosures mounted against a wall provide corrosion-resistant spaces to separate the wall by 1/4 inch or by 3 inches of air for freestanding units.

C. Unused knockouts on panels and boxes shall be covered with approved cover plates manufactured for the purpose.

3.6 TESTS AND INSPECTIONS

A. The Contractor shall assist in making periodic inspections or tests required by the Architect or Engineer. When requested, the Contractor shall provide the assistance of foremen and qualified craftsmen for reasonable duration of each test, etc.

B. The contract will not be declared to be substantially complete until all of the following conditions are satisfied.
   1. the functional operation of the subsystems have been demonstrated and verified and reports have been provided, reviewed and accepted.
   2. The “As-Built” drawings have been submitted, reviewed and accepted by the Architect / Owner / Owner’s Construction Representative.

3.7 SAFETY PRECAUTIONS DURING CONSTRUCTION

A. It shall be the Contractor's responsibility to furnish and install proper guards and instruction signs for prevention of accidents and to provide and maintain for the duration of construction any installations needed for safety of life and property.

3.8 CONNECTIONS

A. This Contractor shall be responsible for providing electrical service to all devices of the heating and air conditioning system, and is referred to the mechanical plan for the exact location of the various devices.

B. Mechanical Controls: Provide 120VAC power connections as required to components of Mechanical Control system. Coordinated quantity of circuits, connection requirements and locations between trades and with provisions of Divisions 21, 22, and 23 sections.

C. Security and Access Control: Where the Drawings indicate a 120VAC circuit in a general area labeled for security or access control use, the intent is for this circuit to be extended and connected to the security or access control device in that general area in coordination with other trades. Coordinated connection requirements and locations between trades and with Owner’s Security vendor prior to installation.

D. Motors and Motor Connections: Motors for driven equipment are specified in Divisions 21, 22, and 23. Provide connections as follows, unless otherwise indicated:
   1. Equipment provided with factory installed disconnecting means: Upon installation of motor and associated equipment, Provide the electrical installation in accordance with approved wiring diagrams and manufacturer’s written instructions.
   2. Equipment furnished with factory disconnecting means: Upon installation of motor and associated equipment, Install factory furnished disconnecting means and provide

the electrical installation in accordance with approved wiring diagrams and manufacturer's written instructions.

3. Equipment not furnished with factory installed disconnecting means: Provide disconnect switch required in accordance with NFPA 70 or as indicated on the Drawings. Provide the electrical installation in accordance with approved wiring diagrams and manufacturer's written instructions.

3.9 UTILITIES

A. The location and voltage of electrical lines and the location of telecommunication lines included within the Work are indicated in the Contract Documents in accordance with information furnished by the Owner. Existing utility lines not indicated in Contract Documents but encountered during construction shall be protected, relocated or capped as directed by the Owner or Engineer.

B. Prior to excavation, examine the site and verify the location and elevation of all utilities and their relation to the Work. Identify and label all underground utilities occurring within the bounds of the area to be excavated. Contact the known utilities and engage a certified locator service to assist in this effort.

C. Prior to excavation, contact the known utilities and inform them of excavation work plan. Proceed with excavation only after receiving approval from Utilities.

D. Assist the Owner in arranging for the removal of existing utility lines within the scope of this Project that are labeled to be abandoned or removed with the respective Utility.

E. All precautions shall be exercised to prevent damage to existing lines, but should work become necessary, it must be authorized prior to execution except in an emergency situation.

F. Should damage result to any utility through the Contractor's negligence or failure to comply with the above directives, the Contractor shall bear the sole responsibility to correct such damage and shall be responsible for all expenses incurred in the expeditious repair or replacement of such damaged Utilities.

G. Repair of damaged utilities shall be to a condition equal to or better than the adjacent undamaged portion of such utility and to the complete satisfaction of the Owner and respective Utility.

3.10 LOAD BALANCING

A. Balance load on all phases in each panel to within 10% of respective phase loads.

3.11 IDENTIFICATION OF EQUIPMENT

A. Identification of Equipment: Refer to specification 26 05 53 Identification for Electrical Equipment.

3.12 COMPLETION

A. The Contractor shall leave all electrical equipment with proper connections, and in proper working order. He shall test the entire electrical system to show that it is properly installed. Contractor shall leave all panels and switches completely fused or complete with circuit breakers.

3.13 RECORD DRAWINGS

A. The Contractor shall furnish one (1) complete set of drawings on which any changes in the work shall be shown. In addition to changes in work contractor shall clearly indicate routing of all feeders both above and below ground. All underground conduit shall be noted on drawings to show “as built” locations. These drawings must be turned over to the Architect prior to final acceptance of the work.

3.14 GUARANTEE

A. The Contractor shall guarantee to keep the entire electrical system as installed by him or his subcontractors in repair and in perfect working order for one (1) year from the date of the final Certification of Final Acceptance, and shall furnish free of cost to the Owner, all material and labor necessary to comply with the above guarantee; said guarantee shall be based upon defective material and workmanship. In any case where equipment has a factory warranty exceeding this one-year limit, the full extent of the warranty shall apply.

3.15 CLEANING

A. When all work has been finally tested, the Contractor shall clean all fixtures, equipment, conduits, ducts, and all exposed work. All cover plates and other finished products shall be thoroughly cleaned.

3.16 VANDAL RESISTANT DEVICES

A. Where vandal resistant screws or bolts are employed on the project, deliver to the Owner 2 suitable tools for use with each type of fastener used, and 25 percent spare fasteners.

B. Proof of delivery of these items to the Owner shall be included in the Operating and Maintenance Manuals.

3.17 INSTRUCTION MANUALS

A. The Contractor shall provide three (3) operating and maintenance instruction manuals on all systems and equipment installed in the electrical work.

B. The Contractor shall provide (3) copies of all warranties and guarantees for systems, equipment, devices, and materials.

END OF SECTION

SECTION 26 05 10

UTILITY COORDINATION SERVICE ENTRANCE

PART 1 GENERAL

1.1 WORK INCLUDED

A. General: Electrical service shall be provided by local utility company. Provide infrastructure, conduit, ductbanks and pathways from public street right-of-way to building for telecommunications and cable service.

B. Power Company Data: Obtain from utility company information and installation standards for electrical, telecommunication, and cable service installation.

C. Responsibilities: Determine what equipment and labor is provided by utility company and what equipment and labor is required of this Contractor.

PART 2 PRODUCTS

2.1 SECONDARY SERVICE CONDUCTORS

A. General: Division 26 shall provide secondary service entrance conductors and conduit.

B. Where required by local utility standards provide in-grade pull boxes.

PART 3 EXECUTION

3.1 INSTALLATION

A. The installation of the service entrance provisions shall comply with the published standards and requirements of the utility company, the utility company's specific construction requirements for this project, and with requirements of this Division.

B. Any failure to meet the standards and requirements shall be corrected to the satisfaction of the utility company and Owner without any additional cost to the Owner.

C. Contractor shall provide all construction materials and labor that the utility company determines to be the responsibility of the customer, at no additional cost to the Owner.

D. The materials and labor required by the for a complete installation shall be provided by the contractor and includes, but is not limited to permanent or removable / lockable vehicular barriers, grounding rods, grounding conductors, sleeves, concrete pads, conduits, metering racks and metering enclosures.

E. Primary distribution poles and service entrance ductbank locations shall be staked and

surveyed prior to pole installation by the Contractor to verify their proper placement is within the Owner's property and respective utility easements. Contractor shall verify by survey that the pole and service entrance ductbank location and easements do not interfere with existing easements, right-of-ways, or other restricted properties. Conflicts with existing easements and restrictions shall be brought to the attention of the Architect prior to construction.

F. Contractor shall initiate contact with the utility providers and Owner within 14 days of Notice to Proceed to ensure permanent power will be available to the site. Any delays resulting from lack of this coordination shall be the responsibility of the Contractor.

G. Prior to commencement of work Contractor shall obtain a statement from Entergy confirming that adequate capacity exists on the existing transformer to accommodate the garage loads. A load data sheet has been submitted to Entergy by Engineer.

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. building wires and cables rated 600V and less
   2. Connectors, splices and terminations rated 600 V and less
   3. Sleeves and sleeve seals for cables

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70- Latest edition or edition enforced by state and local code authority.

PART 2 PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Refer to Part 3 "Conductor and Insulation Applications" Article for insulation type, cable construction, and ratings.

B. Conductor Material: Copper unless indicated otherwise on Drawings; stranded conductor or solid conductor for No. 10 AWG and smaller, stranded for No. 8 AWG and larger.

C. Conductor Insulation Types: Comply with NEMA WC 70 for Types THHN-THWN, XHHW, and SO, as indicated.

D. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

E. Conductor Temperature Rating: Provide conductors with 75 degree C rating. For high temperature applications, provide conductors with temperature ratings in accordance with NDPA 70 for ambient condition.

PART 3 EXECUTION

3.1 CONDUCTOR AND INSULATION APPLICATIONS

A. Service Entrance: Type THHN-THWN, single conductors in raceway.

B. Exposed Feeders: Type THHN-THWN, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and in Crawlspaces: Type THHN-THWN, single conductors in raceway.

E. Exposed Branch Circuits, including in Crawlspaces: Type THHN-THWN, single conductors in raceway.

F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.

G. Branch Circuits Concealed in Concrete and below Slabs-on-Grade: Type THHN-THWN, single conductors in raceway.

H. Branch Circuits Installed below Raised Flooring: Type THHN-THWN, single conductors in raceway.

I. Fire Alarm Cabling: Plenum rated, exposed. Secured per NFPA 70-760.

J. Combining of more than three circuits in a conduit is not allowed. IE no more than three phase conductors.

K. Single Phase Circuits: Provide a dedicated neutral. Sharing of neutrals is not allowed.

L. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

3.2 INSTALLATION

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Run feeders in continuous lengths, without joints or splices. Where continuous runs are impractical; obtain Engineer’s approval for splice locations and application.

C. Run branch in continuous lengths, without joints or splices. Where continuous runs are impractical it shall be permitted to splice, however no splices shall be permitted within in-grade pull boxes.

D. Make joints in branch circuits only where circuits divide.

E. Do not use gutters of panelboards as raceways, junction boxes, or pull boxes for conductors not terminating in said panelboards.

F. Run conduits for emergency power conductors separate from all other wiring.

G. Bundling Conductors: Bundle conductors in switchboards, panelboards, cabinets, and the like, using nylon ties made for the purpose. Bundle conductors larger than No. 10 in individual circuits. Smaller conductors may be bundled in larger groups.

H. Terminations of multiple branch circuit conductors on a single circuit breaker is not acceptable.

I. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours. Install all conductors in raceways, unless specifically noted otherwise.

J. Support cables according to Section "Basic Electrical Materials and Methods."

K. Identify and color-code conductors and cables according to Section “Identification for Electrical Equipment”

L. Sizes:
1. Provide conductors no smaller than No. 12 AWG, except for signal or control circuits.
2. Use #10 AWG conductors for 20 amperage 120V circuits when the circuit conductors are longer than 75 feet.
3. Use #10 AWG conductors for 20 amperage 277V circuits when the circuit conductors are longer than 200 feet.
4. Provide neutral conductors of the same size as the phase conductor(s) for individual branch circuit homeruns.

3.3 WIRE PULLING

A. Pull no conductors into conduits until all Work of a nature which may cause injury to conductors is completed.

B. Follow manufacturers’ recommendations for regulating temperature conditions of conductors prior to installation.

C. Exercise care in handling and installing cables to avoid damage. Carefully form cables in equipment pull boxes. Form bends in cables larger than the minimum radii shown in the cable manufacturer's published data for minimum bends such that bends will not reduce the cable life.

D. Provide suitable installation equipment to prevent abrasion and cutting of conductors by raceways during the pulling of conductors. Use ropes of polyethylene, nylon or other suitable non-metallic material to pull in feeders. Metallic ropes are prohibited.

E. Before any wire is pulled into any conduit, thoroughly swab the conduit to remove all

foreign material and to permit the wire itself to be pulled into a clean, dry conduit.

F. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

G. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B

B. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

C. Provide temperature ratings of connectors and splices to match wire rating.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. NFPA 70 and IEEE C2 include basic grounding requirements for electrical safety. This Section supplements the minimum safety requirements of the Code with requirements for additional grounding and with optional grounding methods and materials for both power and electronic systems.

B. This Section includes methods and materials for grounding systems and equipment, plus the following special applications:
   1. Underground distribution grounding.
   2. Common ground bonding with lightning protection system.

1.2 QUALITY ASSURANCE

A. Testing Agency Qualifications: For independent agency as defined in Division 26 Section "Common Work Results for Electrical".

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with UL 467 for grounding and bonding materials and equipment.

D. Comply with NFPA 70

E. Comply with IEEE C2

F. Comply with ANSI/EIA/TIA-607

PART 2 PRODUCTS

2.1 CONDUCTORS

A. Insulated Conductors: Copper or Tinned-Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:
   1. Solid Conductors: ASTM B 3.
   2. Stranded Conductors: ASTM B 8.
   3. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.

4. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
5. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
6. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
7. Main Bonding Jumper: stranded copper conductors sized as indicated on Drawings.
8. Grounding Electrode Conductor: stranded copper conductors sized as indicated on Drawings.
9. Common Grounding Electrode Conductor: stranded copper conductors sized as indicated on Drawings.

C. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 4 inches (6 by 100 mm) in cross section, unless otherwise indicated; with insulators. Length as indicated on Drawings.

2.2 CONNECTORS

A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.
1. Pipe Connectors: Clamp type, sized for pipe.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 5/8 inch (16 mm) diameter by 120 inches (3000 mm) long, unless otherwise indicated.

PART 3 EXECUTION

3.1 APPLICATIONS

A. Conductors: Install insulated solid conductor for No. 10 AWG and smaller, and insulated stranded conductors for No. 8 AWG and larger, unless otherwise indicated.

B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 3/0 AWG minimum, unless otherwise indicated.
1. Bury at least 30 inches (762 mm) below grade.
2. Duct-Bank Grounding Conductor: Bury 12 inches above duct bank when indicated as part of duct bank installation.

C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green

and two bands of yellow.

D. Grounding Bus: Install in electrical and telephone/communications equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
   1. Install bus on insulated spacers 1 inch (25 mm), minimum, from wall 6 inches (150 mm) above finished floor, unless otherwise indicated.
   2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, down to specified height above floor, and connect to horizontal bus.

E. Conductor Terminations and Connections: Use the following connectors styles, unless otherwise indicated.
   1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
   2. Underground Connections: Exothermic Welded connectors, except at test wells and as otherwise indicated.
   3. Connections to Ground Rods at Test Wells: Bolted connectors.
   4. Connections to Structural Steel: Exothermic Welded connectors.
   5. Connections to Ufer Ground: Exothermic Welded connectors.

F. Comply with ANSI-607 requirements for telephone/communications grounding riser

3.2 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

B. Grounding Handholes: Install a driven ground rod through handhole floor, close to wall, and set rod depth so 4 inches (100 mm) will extend above finished floor. If necessary, install ground rod before handhole/manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches (50 mm) above to 6 inches (150 mm) below concrete. Seal floor opening with waterproof, nonshrink grout.

C. Pad-Mounted Transformers and Switches: The following is a minimum if the utility company does not have requirements, otherwise meet the utility company requirements. Install two ground rods and a ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with transformer, switch, or substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches (150 mm) from the edge of foundation.

D. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits

3.3 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.
   1. Bond to each device, box, or luminaire, unless otherwise indicated.
   2. Conductor insulation of the same rating as the phase conductors, for all feeders and branch circuits. Install the grounding conductors in the raceway with related phase and neutral conductors.
   3. Where parallel conductors in separate raceways occur, provide a grounding conductor in each raceway that meets requirements of NFPA 70.

B. Dry-Type Transformers: Install an insulated grounding conductor from the common point of connection of the transformer secondary neutral point and the transformer enclosure to the following:
   1. The nearest grounding electrode per NFPA 70, including but not limited to building steel where available.
   2. The grounding bus of the common electrode grounding system, located in the electrical equipment room.

C. Enclosures: Install an insulated grounding conductor from grounding bushings to the frame of the enclosure, ground bus, and equipment grounding strap where each occurs. Install grounding bushings on all raceways terminating within electrical enclosures constructed of separate enclosure panels, which are not integrally welded together.

D. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including but not limited to air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

E. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.

F. Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
   1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-4 (6-by-1000) grounding bus. Length as indicated on the drawings.
   2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

3.4 INSTALLATION

A. Provide permanent service neutral and equipment grounding in accordance with NFPA 70 and subject to the following additional requirements.

B. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

C. Comply with mounting and support requirements specified in Division 26 Section "Hangers

and Supports for Electrical Systems."

D. Connect the service neutral and equipment ground to a common point within the metallic enclosure containing the main service disconnecting means. Equipment grounds and the identified neutral of the wiring system shall not be interconnected beyond this point in the interior wiring system. From the common point of connection of the service neutral and the equipment ground, run in non-magnetic conduit a grounding electrode conductor without joint or splice to the grounding electrode system and connect it with an approved bolted pressure clamp.

E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
   1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
   2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
   3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.
   4. Where expansion joints or telescoping joints occur, provide bonding jumpers.

F. Grounding and Bonding for Piping:
   1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
   2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
   3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

G. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.

H. Ground Rods: Drive rods until tops are 12 inches (50 mm) below finished floor or final grade, unless otherwise indicated.
   1. Interconnect ground rods with grounding electrode conductor a minimum of 30-inches below grade unless otherwise indicated. Make connections without exposing steel or damaging coating, if any.
   2. For grounding electrode system, install at least three rods spaced at least two-rod lengths from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

I. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Division 26 Section "Underground Ducts and Raceways for Electrical Systems," and shall be at least 12 inches (300 mm) deep, with cover.

1. Test Wells: Install at least three test wells for each service, unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

J. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet (18 m) apart.

K. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NFPA 70, using a minimum of 20 feet (6 m) of bare copper conductor not smaller than No. 4 AWG.
1. If concrete foundation is less than 20 feet (6 m) long, coil excess conductor within base of foundation.
2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building grounding grid or to grounding electrode external to concrete.

3.5 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components as specified in Division 26 Section "Identification for Electrical Systems."

3.6 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare certified test reports:
1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum at service disconnect enclosure grounding terminal, at ground test wells, at individual ground rods and locations where a ground-resistance level is specified,. Make tests at ground rods before any conductors are connected.
a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
b. Perform tests by fall-of-potential method according to IEEE 81.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Hangers and supports for electrical equipment and systems.
   2. Construction requirements for concrete bases.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. FMC: Flexible metal conduit.

C. IMC: Intermediate metal conduit.

D. RMC: Rigid metal conduit.

E. RAC: Rigid aluminum conduit.

F. RNC: Rigid nonmetallic conduit.

G. RSC: Rigid Steel conduit.

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design supports for multiple raceways, raceways using NFPA 70 criteria and performance requirements and design criteria indicated.
   1. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
   2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

B. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.5 SUBMITTALS

A. Product Data: For the following:
   1. Steel slotted support systems.
   2. Nonmetallic slotted support systems.

B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
   1. Trapeze hangers. Include Product Data for components.
   2. Steel slotted channel systems. Include Product Data for components.
   3. Nonmetallic slotted channel systems. Include Product Data for components.
   4. Equipment supports.
   5. Concrete Based for Equipment.

C. Welding certificates.

1.6 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Comply with NFPA 70.

1.7 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 07 Section "Roof Accessories."

PART 2 PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Allied Tube & Conduit.
      b. Cooper B-Line, Inc.; a division of Cooper Industries.
      c. ERICO International Corporation.
      d. GS Metals Corp.
      e. Thomas & Betts Corporation.
      f. Unistrut; Tyco International, Ltd.
      g. Wesanco, Inc.
   2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
   3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.

4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
5. Channel Dimensions: Selected for applicable load criteria.

B. Nonmetallic Slotted Support Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with 9/16-inch- (14-mm-) diameter holes at a maximum of 8 inches (200 mm) o.c., in at least 1 surface.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Allied Tube & Conduit.
   b. Cooper B-Line, Inc.; a division of Cooper Industries.
   c. Fabco Plastics Wholesale Limited.
   d. Seasafe, Inc.
2. Fittings and Accessories: Products of channel and angle manufacturer and designed for use with those items.
3. Fitting and Accessory Materials: Same as channels and angles, except metal items may be stainless steel.
4. Rated Strength: Selected to suit applicable load criteria.

C. Device Box Mounting Brackets and Stabilizer: Factory-fabricated sheet steel brackets for support of device boxes adjacent to or between studs. Support from a single stud is prohibited.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Cooper B-Line, Inc.; a division of Cooper Industries.
   b. ERICO International Corporation.

D. Through-Stud Cable and Raceway Support Clips: Factory-fabricated spring steel clip for cables or raceways where run horizontally through metal studs.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Cooper B-Line, Inc.; a division of Cooper Industries.
   b. ERICO International Corporation.

E. Roof-mounted Raceway Support Blocking: Factory-fabricated support blocking for use under roof-mounted raceways. Wedge-shaped blocking constructed of 100% recycled UV-resistant Rubber with integral galvanized steel strut to accept raceway support clips.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Cooper B-Line, Inc.; a division of Cooper Industries.
   b. ERICO International Corporation.

F. Tee Bar Grid Box Hanger: Factory-fabricated metal electrical box hanger for supporting boxes at locations between ceiling system t-grid components. Height adjustable for various electrical box depths. Attached to ceiling tee bar with screws or integral clamp for stability.

Includes tab for independent support wire attachment.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Cooper B-Line, Inc.; a division of Cooper Industries.
   b. ERICO International Corporation.

G. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

H. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

I. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

J. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

K. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
   a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      1) Hilti Inc.
      2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      3) MKT Fastening, LLC.
      4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
   a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      1) Cooper B-Line, Inc.; a division of Cooper Industries.
      2) Empire Tool and Manufacturing Co., Inc.
      3) Hilti Inc.
      4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      5) MKT Fastening, LLC.
3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.

6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

B. Materials: Comply with requirements in Division 05 Section "Metal Fabrications" for steel shapes and plates.

PART 3 EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Horizontal and Vertical Support Spacing for Raceway(s): Space supports for EMT, IMC, and RMC as required by NFPA 70, but in no case less than listed below:
1. For raceways 1" diameter and larger, provide one hanger at 8'-0" on center.
2. For raceways less than 1" diameter, provide one hanger at 5'-0" on center.

C. Minimum Hanger Rod Size for Raceway Supports: Minimum rod size shall be 1/4 inch (6 mm) in diameter.

D. Single Raceways or Cables:
1. For Raceways 1-1/4-inch (32mm) and smaller: Install adjustable steel band hanger suspended on threaded rod.
2. For Raceways larger than 1-1/4-inch (30mm): Install trapeze-type supports fabricated with steel slotted support system suspended on threaded rods. Size trapeze members, including the suspension rods, based on the support required for the size, and loaded weight of the conduits.
   a. Secure raceway or cable to support with two-bolt conduit clamps or single-bolt conduit clamps using spring friction action for retention in support channel.

E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
1. Secure raceways and cables to these supports with two-bolt conduit clamps single-bolt conduit clamps using spring friction action for retention in support channel.

F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

G. Corrosive Areas: Provide non-metallic slotted support systems for supports installed in

corrosive areas. Corrosive areas include, but are not limited to the following:
1. Pools and Pool Equipment Areas.
2. Within 25-feet (7.62-m) of Cooling Towers and Air Cooled Chillers.

3.2 SUPPORT INSTALLATION

A. Comply with NFPA 70, NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT IMC RMC EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.

C. Fasten junction, pull and devices boxes securely to the building construction, independent of raceway system.

D. Install Device Box Mounting Brackets supported between two studs. Do not attached Receptacle boxes directly to a single stud.

E. Install Through-Stud Cable and Raceway Support Clips where cables or raceways run horizontally through metal studs.

F. Support raceways at a distance above suspended ceilings to permit removal of ceiling panels and luminaires.

G. Locate raceways so as not to hinder access to mechanical equipment.

H. Do not secure conductors, raceways, or supports to suspended ceiling hanger rods or wires.

I. Install Tee Bar Grid Box Hanger supported between two ceiling grid tee bars where devices boxes are located flush in recessed suspended ceilings.
1. Install at least one independent support rod from box hanger to structure.

J. Install Roof-mounted Raceway Support Blocking where raceways run on across roofing.
1. Coordinate installation of roof supports with items specified in Division 07 Section "Roof Accessories." Provide products compatible with rooftop materials included in the Work.

K. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

L. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion

anchor fasteners on solid masonry units.

4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69 or Spring-tension clamps.
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

M. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Division 05 Section "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 03 Section "Cast-in-Place Concrete."

C. Anchor equipment to concrete base.

1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.5 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Touchup: Comply with requirements in Division 09 painting Sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 26 05 33

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

B. Related Sections include the following:
1. Refer to architectural for firestopping materials and installation at penetrations through walls, ceilings, and other fire-rated elements.
2. "Wiring Devices" for devices installed in boxes and for floor-box service fittings.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. ENT: Electrical nonmetallic tubing.

C. FMC: Flexible metal conduit.

D. IMC: Intermediate metal conduit.

E. LFMC: Liquidtight flexible metal conduit.

F. LFNC: Liquidtight flexible nonmetallic conduit.

G. RNC: Rigid nonmetallic conduit.

1.4 SUBMITTALS

A. Product Data: For surface raceways, floor boxes, and cabinets.

B. Coordination Drawings: Submit Coordination Drawings in accordance with Division 26 Section “Basic Electrical Requirements”. Include the following:
1. Raceway routing plans, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
a. Proposed cable pull points.
b. Structural members in the paths of conduit groups with common supports.
c. HVAC, plumbing items, and architectural features in the paths of conduit

groups. Denote where systems share common supports.

d. Purposed splice locations.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70-Latest edition or edition enforced by state and local code authority.

1.6 COORDINATION

A. Coordinate layout and installation of raceways, boxes, enclosures, cabinets, and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 PRODUCTS

2.1 METAL WIREWAYS

A. Material and Construction: Sheet metal sized and shaped as indicated.
1. Indoors: NEMA-1
2. Outdoors: NEMA-3R

B. Fittings and Accessories:
1. Include couplings, offsets, elbows, expansion joints, adapters, hold- down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
2. Provide spring nuts or guards on all screws installed toward the inside to prevent wire insulation damage.

C. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70 and UL 870.

D. Wireway Covers:
1. Hinged type unless access restrictions require screw-cover type.
2. Flanged-and-gasketed as required for NEMA type

E. Finish: Manufacturer's standard enamel finish.

2.2 SURFACE RACEWAYS

A. Surface Metal Raceways: Galvanized steel with snap-on covers. Finish with manufacturer's standard prime coating and two coats of paint. Color by Architect.

B. Surface Nonmetallic Raceways: Two-piece construction, manufactured of rigid PVC with texture and color selected by Architect from manufacturer's standard colors.

C. Surface raceways used together with couplings, clips, bushings, straps, connectors, connection covers, elbows, boxes, extension boxes, fixture boxes, extension adapters, blank covers and all other required fittings; size to accommodate the conductors to be installed therein in each case.

2.3 BOXES, ENCLOSURES, AND CABINETS

A. Sheet Metal Pull and Junction Boxes: NEMA OS 1.

B. Cast-Metal Pull and Junction Boxes: NEMA FB 1, cast aluminum, type FD with gasketed cover.

C. Hinged-Cover Enclosures: with continuous hinge cover and flush latch.
1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Nonmetallic Enclosures: Plastic, finished inside with radio-frequency-resistant paint.
3. Ratings:
   a. Indoor Locations: NEMA 250, Type 1.
   b. Outdoor Locations: NEMA 250, Type 3R.

D. Cabinets:
1. Hinged door in front cover with flush latch and concealed hinge.
2. Key latch to match panelboards.
3. metal barriers to separate wiring of different systems and voltage and
4. Accessory feet where required for freestanding equipment.
5. Feet: Provide accessory feet for free standing equipment.
6. Ratings:
   a. Indoor Locations: NEMA 250, Type 1.
   b. Outdoor Locations: NEMA 250, Type 3R.

E. In Grade Enclosures, Boxes And Covers:
1. required to conform to all test provisions of the most current ANSI/SCTE 77 for Tier 22 applications.
2. When multiple “Tiers” are specified the boxes must physically accommodate and structurally support compatible covers while possessing the highest Tier rating.
3. All covers are required to have the Tier level rating embossed on the surface. In no assembly can the cover design load exceed the design load of the box.
4. Cover to be labeled per use of box, ie “Electrical, Communications, etc”. Communications pull boxes shall be a minimum of 24"W X 36"L X 36 “D.

2.4 FACTORY FINISHES

A. Finish: For raceway, enclosure, or cabinet components, provide manufacturer's standard prime- coat finish ready for field painting.

2.5 METAL CONDUIT AND TUBING

A. Rigid Steel Conduit: Comply with ANSI C80.1 and UL 6; Galvanized rigid steel, each

length with a coupling on one end and thread protector on opposite end.

B. Aluminum Rigid Conduit: Comply with ANSI C80.5 and UL 6A; Rigid aluminum, each length with a coupling on one end and thread protector on opposite end.

C. IMC: Comply with ANSI C80.6. and UL 1242.

D. Plastic-Coated Steel Conduit and Fittings: Comply with NEMA RN 1; PVC-coated RSC with 0.040 inch (1 mm), minimum coating thickness.

E. EMT and Fittings: ANSI C 80.3 and UL 797

F. FMC: Aluminum

G. LFMC: Comply with UL 360; Flexible steel conduit with neoprene jacket and copper grounding strand.

H. Conduit fittings for Hazardous (Classified) Locations: Comply with UL 886.

I. Fittings for RSC, RAC and IMC: Provide factory made threaded couplings of same material as the conduit.
   1. Molded thermoplastic insulating bushing at all boxes and cabinets, with locknuts inside and outside box or cabinet. In wet locations, provide watertight hubs for conduit entry into enclosures.
   2. Thermoplastic insulated grounding bushing on all conduits where grounding bushings are required, with locknuts inside and outside the enclosure. In wet locations provide watertight hubs for conduit entry into enclosures.
   3. Provide bushings on all conduits 1” or larger.

J. Fittings for EMT:
   1. Steel, set-screw or compression couplings.
   2. Steel, set-screw or compression insulated throat box connectors with molded thermoplastic insulating bushing at all boxes and cabinets, with locknuts inside box or cabinet.
   3. Steel, set-screw or compression insulated throat box connectors with thermoplastic insulated grounding bushing on all tubing where grounding bushings are required.
   4. Insulated throat material for fittings to be of a color that is easily distinguishable; clear thermoplastic throats are not acceptable.
   5. Provide bushings on all conduits 1” or larger.
   6. Provide thermoplastic bushings on all conduits for telecommunications, data, fire alarm cabling and similar.

K. Fittings for FMC and LFMC:
   1. Adapters at connections between flexible and rigid conduit.
   2. Thermoplastic insulated throat, steel connectors at box or cabinet terminations.
   3. Insulated throat material for fittings to be of a color that is easily distinguishable; clear thermoplastic throats are not acceptable.

L. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable:

NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.

M. Joint Compound for RSC or IMC: Listed for use in cable connector assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.

PART 3 EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors:
1. Exposed: RSC, or RAC..
2. Concealed: RSC, or RAC
3. Underground, Single Run: RNC.
4. Underground, Grouped: RNC.
5. Emergency Feeders: RSC
6. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
7. Boxes and Enclosures: NEMA 250, Type 3R, unless otherwise indicated.

B. Indoors:
1. Exposed, Not Subject to Physical Damage: EMT. Concealed: EMT.
2. Exposed and Subject to Physical Damage: RSC, or IMC.
3. Open Parking Decks, Ramps, Vehicular Circulation Areas, Perimeter Bays, and Other Locations Subject to Condensation, Wind-Driven Rain, Washdown, or Sprinkler Discharge: Hot-dip galvanized RSC or IMC with threaded, raintight, corrosion-resistant fittings.
4. Elevator Pits: RAC, RSC, IMC, or LFMC.
5. Emergency, Legally Required Standby, and Optional Standby Feeders and Branch Circuits:
    a. Dry, Enclosed Locations: EMT.
    b. Open Parking Garage, Damp, Wet, or Physically Exposed Locations: RSC or IMC.
    c. Install raceways and conductors separately from normal power systems where required by NFPA 70.
6. Conductors over 600 volts: RAC, RSC, or IMC.
7. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except use LFMC in damp or wet locations.
8. Damp or Wet Locations above Ground: RAC, RSC, or IMC
9. Boxes and Enclosures: NEMA 250, Type 1, except as follows:
    a. Damp or Wet Locations: NEMA 250, Type 4, stainless steel.

C. Minimum Raceway Size:
1. Branch Circuits:3/4-inch (21mm) trade size
2. Feeder Circuits: 3/4-inch (21mm)

D. Provide minimum 1/2-inch (16-mm) conduit for controls circuiting.

E. Raceway Fittings: Compatible with raceways and suitable for use and location.
   1. RAC, RSC and IMC: Use threaded fittings, unless otherwise indicated.

F. Junction and Pull Boxes: Sheet steel boxes, unless noted or required otherwise.
   1. Provide boxes no smaller than 4 inches square and 1-1/2 inches deep.
   2. Size all junction and pull boxes in accordance with the NFPA 70, unless project conditions dictate use of larger boxes.

G. Outlet and Device Boxes: Sheet steel boxes, unless noted or required otherwise.
   1. For Lighting Fixture Outlets: 4 inch square with raised fixture ring.
   2. For Wall Switches, Receptacles, and Communication Use: 4 inch square, one-piece. Use boxes with plaster rings in all plastered walls where wall thickness permits. Use boxes less than 1-1/2 inch deep only in locations where deep boxes cannot be accommodated by construction.
   3. Boxes Used Outdoors or in Damp/Wet Locations: Cast metal boxes with gasketed covers and threaded hubs.

3.2 INSTALLATION

A. Install raceways a minimum of 6-inches (150 mm) away from parallel runs of flues, steam pipes, hot-water pipes, and other objects operating at high temperatures

B. Install horizontal raceway runs above water and steam piping. Install raceways a minimum of 1-inch (25.4-mm) from pipe insulation.

C. Complete raceway installation before starting conductor installation.

D. Support raceways as specified in "Basic Electrical Requirements."

E. Install temporary closures to prevent foreign matter from entering raceways.

F. Recessed Boxes in Fire-Rated Partitions: For boxes located on opposite sides of same partition do not install boxes back-to-back; separate boxes with a minimum of 24 inch separation

G. Do not install aluminum conduits in contact with concrete.

H. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and keep straight legs of offsets parallel, unless otherwise indicated.

I. Conceal conduit:
   1. EMT shall be installed within finished walls, ceilings, and floors, unless otherwise indicated.
   2. Install concealed raceways with a minimum of bends in the shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.
   3. On concealed conduit systems where boxes are not otherwise accessible, set boxes

flush with finished surfaces for access, and provide overlapping covers.

J. Raceways Embedded in Slabs: Install in middle 1/3 of slab thickness where practical and leave at least 2 inches (50 mm) of concrete cover.
   1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
   2. Space raceways laterally to prevent voids in concrete.
   3. Run conduit larger than 1-inch trade size (DN 27) parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.

K. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
   1. Run parallel or banked raceways together on common supports.
   2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.

L. Join raceways with fittings designed and approved for that purpose and make joints tight.
   1. Use insulating bushings to protect conductors.

M. Terminations:
   1. Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.
   2. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.

N. Stub-up Connections:
   1. Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor.
   2. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches (150 mm) above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.
   3. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above the finished slab.
   4. Change from ENT to RAC, RSC, or IMC before rising above the floor.

O. Flexible Conduit Connections:
   1. Use minimum of 24” and maximum of 72 inches at final connections to equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
   2. Use LFMC in damp or wet locations subject to severe physical damage including mechanical equipment rooms, at motor or equipment locations at or near pumps, and when installed outdoors.
   3. Use LFMC in damp or wet locations not subject to severe physical damage.

P. Install covers on junction boxes and conduit bodies after wiring and connections are completed.

Q. Run conductors over 48 Volts in raceway, unless otherwise indicated.

R. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways to receptacle or fixture ground terminals.

S. Pull Boxes:
1. Install no more than the equivalent of three 90-degree bends and a maximum of 150 feet between pull points in any conduit run except for communications conduits, for which fewer bends are allowed.
2. Provide boxes where shown and where necessary for the installation and pulling of cables and wires.

T. Pull Wires:
1. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength.
2. Leave at least 12 inches (300 mm) of slack at each end of pull wire.

U. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

3.3 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.4 CLEANING

A. After completing installation of exposed, factory-finished raceways and boxes, inspect exposed finishes and repair damaged finishes.

END OF SECTION

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnish and install items for identification of electrical products installed under Division 26.

1.2 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

C. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.

1.3 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes and standards. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 PRODUCTS

2.1 RACEWAY AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Color for Printed Legend:
1. Power Circuits: Black letters on an orange field.
2. Legend: Indicate system or service and voltage, if applicable.
a. Typical:
1) Type: Example – AC 60 Hertz
2) Load: Example – Lighting and Power

3) Voltage: Example – 120VA / 1 Phase

b. As Required
   1) If more than one type of power is available in a conduit, then it shall be marked with the title “Electrical” on orange background.
   2) If used for control of HVAC conduit shall be marked with the title “Control” on an orange background

c. Conduit that contains communication systems shall have the exact contend and title on blue background.

C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

D. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches (50 mm) wide; compounded for outdoor use.

2.2 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.

B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

2.3 UNDERGROUND-LINE WARNING TAPE

A. Description: Permanent, bright-colored, continuous-printed, polyethylene tape.
   1. Not less than 6 inches (150 mm) wide by 4 mils (0.102 mm) thick.
   2. Compounded for permanent direct-burial service.
   3. Embedded continuous metallic strip or core.
   4. Printed legend shall indicate type of underground line.

2.4 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145

B. Self-Adhesive Warning Labels: Factory printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment, unless otherwise indicated.

C. Baked-Enamel Warning Signs: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application. 1/4-inch grommets in corners for mounting. Nominal size, 7 by 10 inches.

D. Warning label and sign shall include, but are not limited to, the following legends:
   1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENTHAS MULTIPLE POWER SOURCES."

2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR ## INCHES." Verify work space required for specific project conditions with NFPA 70 and replace "##" in previous sentence with appropriate distance.
3. Arc Flash Warning and Instructions: "WARNING – ARC FLASH AND SHOCK HAZARD. WEAR APPROPRIATE PPE. Determine appropriate protective clothing and personal protective equipment (PPE) for the task from NFPA 70E.

2.5 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. in. and 1/8 inch thick for larger sizes.

B. Engraved legend with black letters on white face.

C. Punched or drilled for mechanical fasteners.

D. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.6 ONE-LINE DIAGRM NAMEPLATE

A. Preprinted engraved, laminated acrylic or melamine plastics sign. Nominal size, 12 by 12 inches (305 by 305 mm) by 1/8 inch (3.2 mm) thick. Engraved legend with black letters on white face. Image on sign depicting equipment components in single-line diagram format, using symbols and letter designations consistent with final one-line bus diagram. Produce a concise visual presentation of principal equipment components and connections.

2.7 EQUIPMENT IDENTIFICATION LABELS

A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch. Lettering and Background colors as indicated below:

System / Circuit Type	Label Letter Color	Background Color	Notes
Normal Power Circuits	White	Black	Applies to all normal distribution equipment and receptacles.
Emergency / Legally Required Standby (ESS prior to ATS)	Black	Yellow	Applies to essential electrical systems (ESS) prior to automatic transfer switch (ATS)
Life Safety Branch	White	Red	Applies to Panels and receptacles fed from Life Safety.
Fire Alarm System	Black	Red	Applies to FACP, annunciators, initiating and notification circuits.

Fire Suppression Supervisory & Control	Yellow	Red	Sprinkler, clean agent, or suppression monitoring.
Combined Fire Alarm & Security	Blue	Red	Only if systems are combined in panels or circuits.
Security System	Blue	Yellow	Access control, intrusion detection, cameras.
Mechanical / Electrical Supervisory (BAS)	Green	White	Building automation and monitoring systems.
Telecommunications	Blue	White	Structured cabling, data, voice. (Coordinate with Division 27).
Control Wiring	Green	White	HVAC and other control circuits.

2.8 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties : Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.
   1. Minimum Width: 3/16 inch (5 mm)
   2. Tensile Strength: 50 lb (22.6 kg), minimum
   3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
   4. Color: Black, except where used for color-coding.

B. Paint: Paint materials and application requirements are specified in Division 09 painting Sections.

C. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 EXECUTION

3.1 APPLICATION

A. Accessible Raceways More Than 600 V: Identify with "DANGER-HIGH VOLTAGE" in black letters at least 2 inches (50 mm) high, with self-adhesive vinyl labels. Repeat legend at 10-foot(3-m) maximum intervals.

B. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use color-coding conductor tape. Identify each ungrounded conductor according to source and circuit number.

C. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source and circuit number.

D. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, signal, sound, intercommunications, voice, and data connections.
   1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and

pull points. Identify by system and circuit designation.

2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and Operation and Maintenance Manual.

E. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable. Install underground-line warning tape for both direct-buried cables and cables in raceway.

F. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Comply with 29 CFR 1910.145 and apply self-adhesive warning labels. Identify system voltage with black letters on an orange background. Apply to exterior of door, cover, or other access.

1. Equipment with Multiple Power or Control Sources: Apply to door or cover of equipment including, but not limited to, the following:
   a. Power transfer switches.
2. Equipment Requiring Workspace Clearance According to NFPA 70: Unless otherwise indicated, apply to door or cover of equipment but not on flush panelboards and similar equipment in finished spaces.
3. Arc Flash Warning Labels: Apply label to door or cover at all access point of equipment including, but not limited to, the following:
   a. Disconnect switches
   b. Enclosed circuit breakers
   c. Panelboards
   d. Power transfer equipment (ATS/MTS)
   e. Transformers

G. Junction Boxes and Pull Boxes: Identify voltage, source, and circuit number(s) on cover of pull and junction boxes with hand-written legible block lettering using black permanent marking pen.

H. Instruction Signs:

1. Operating Instructions: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
2. Emergency Operating Instructions: Install instruction signs with minimum 3/8-inch-(10-mm-) high letters for emergency instructions at equipment used for power transfer load shedding, Kirk Key Controlled Breakers.

I. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. This applies to existing equipment that is modified during this project. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where 2 lines of text are required, use labels 2 inches high.
b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.

2. Equipment to Be Labeled Shall Include But Not Be Limited To:
a. Panelboards, electrical cabinets, and enclosures.
b. Access doors and panels for concealed electrical items.
c. Transformers.
d. Emergency system boxes and enclosures.
e. Disconnect switches.
f. Enclosed circuit breakers.
g. Power transfer equipment. (ATS/MTS)
h. Fire-alarm control panel and annunciators
i. Power-generating units.
j. All junction boxes. Label to include circuit numbers (panel and number).
k. All receptacle device plates shall be etched with circuit numbers. (panel and number).
l. All lighting switch plates shall be etched with circuit numbers (panel and number)

Examples:

NORMAL 'HA' 480Y/277V FED FROM 'MDP'	EMERGENCY SYSTEM 'ATS-LS' 480Y/277V FED FROM 'MDP' NORMAL FED FROM 'EMSB' EMERGENCY FEEDS 'LS-HA'	NORMAL 'T-LA' 75KVA, 480V to 208Y/120V FED FROM 'HA' FEEDS 'LA'

3. Provide for each feeder overcurrent protective device in each switchgear, switchboard, distribution panelboard, motor control center, and any other similar equipment furnished under this Division, identification as to the specific load that it serves.

J. Existing Panel Schedules: Any existing panel where a circuit was removed, relocated or added, the contractor shall provide a new panel schedule with updated information.

3.02 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach non-adhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.

F. System Identification Color Banding for Raceways and Cables: Each color band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.

G. Color-Coding for Identification, 600 V and Less: Use the colors listed below for ungrounded service, feeder, and branch-circuit conductors.
   1. Color shall be factory applied or for sizes larger than No. 1 AWG, if authorities having jurisdiction permit, field applied.
   2. Colors for Grounding Conductors:
      a. Equipment Grounding Conductor: Green.
      b. Isolated Equipment Grounding Conductor: Green with Yellow Stripe.
   3. Colors for 208/120-V Wye Systems:
      a. Phase A: Black.
      b. Phase B: Red.
      c. Phase C: Blue.
      d. Grounded Conductor (Neutral): White
   4. Colors for 480/277-V Wye Systems:
      a. Phase A: Brown.
      b. Phase B: Orange
      c. Phase C: Yellow.
      d. Grounded Conductor (Neutral): Gray
   5. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

H. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.

I. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches (400 mm) overall.

J. Painted Identification: Prepare surface and apply paint according to Division 09 painting Sections.

END OF SECTION

SECTION 26 05 72

OVERCURRENT PROTECTIVE DEVICE SHORT-CIRCUIT STUDY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes a computer-based, fault-current study to determine the minimum interrupting capacity of circuit protective devices.

1.3 DEFINITIONS

A. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

B. One-Line Diagram: A diagram which shows, by means of single lines and graphic symbols, the course of an electric circuit or system of circuits and the component devices or parts used therein.

C. Protective Device: A device that senses when an abnormal current flow exists and then removes the affected portion from the system.

D. SCCR: Short-circuit current rating.

E. Service: The conductors and equipment for delivering electric energy from the serving utility to the wiring system of the premises served.

1.4 ACTION SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Other Action Submittals: Submit the following after the approval of system protective devices submittals. Submittals shall be in digital form.
   1. Short-circuit study input data, including completed computer program input data sheets.
   2. Short-circuit study and equipment evaluation report; signed, dated, and sealed by a qualified professional engineer.
      a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect for preliminary submittal of sufficient study data to ensure that the selection of devices and associated characteristics is satisfactory.

b. Revised single-line diagram, reflecting field investigation results and results of short-circuit study.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Short-Circuit Study Specialist and Field Adjusting Agency.

B. Product Certificates: For short-circuit study software, certifying compliance with IEEE 399.

1.6 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are unacceptable.

B. Short-Circuit Study Software Developer Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.
1. The computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.

C. Short-Circuit Study Specialist Qualifications: Professional engineer in charge of performing the study and documenting recommendations, licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

D. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.1 COMPUTER SOFTWARE

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. SKM Systems Analysis, Inc.
2. ETAP

B. Comply with IEEE 399 and IEEE 551.

C. Analytical features of fault-current-study computer software program shall have the capability to calculate "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

D. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output.

2.2 SHORT-CIRCUIT STUDY REPORT CONTENTS

A. Executive summary.

B. Study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpretation of the computer printout.

C. One-line diagram, showing the following:
1. Protective device designations and ampere ratings.
2. Cable size and lengths.
3. Transformer kilovolt ampere (kVA) and voltage ratings.
4. Motor and generator designations and kVA ratings.
5. Switchgear, switchboard, motor-control center, and panelboard designations.

D. Comments and recommendations for system improvements, where needed.

E. Protective Device Evaluation:
1. Evaluate equipment and protective devices and compare to short-circuit ratings.
2. Tabulations of circuit breaker, fuse, and other protective device ratings versus calculated short-circuit duties.
3. For 600-V overcurrent protective devices, ensure that interrupting ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.
4. For devices and equipment rated for asymmetrical fault current, apply multiplication factors listed in the standards to 1/2-cycle symmetrical fault current.
5. Verify adequacy of phase conductors at maximum three-phase bolted fault currents; verify adequacy of equipment grounding conductors and grounding electrode conductors at maximum ground-fault currents. Ensure that short-circuit withstand ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.

F. Short-Circuit Study Input Data: As described in "Power System Data" Article in the Evaluations.

G. Short-Circuit Study Output:
1. Low-Voltage Fault Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
a. Voltage.
b. Calculated fault-current magnitude and angle.
c. Fault-point X/R ratio.
d. Equivalent impedance.
2. Momentary Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
a. Voltage.
b. Calculated symmetrical fault-current magnitude and angle.
c. Fault-point X/R ratio.
d. Calculated asymmetrical fault currents:

1) Based on fault-point X/R ratio.
2) Based on calculated symmetrical value multiplied by 1.6.
3) Based on calculated symmetrical value multiplied by 2.7.

3. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
   a. Voltage.
   b. Calculated symmetrical fault-current magnitude and angle.
   c. Fault-point X/R ratio.
   d. No AC Decrement (NACD) ratio.
   e. Equivalent impedance.
   f. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a symmetrical basis.
   g. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total basis.

PART 3 EXECUTION

3.1 EXAMINATION

A. Obtain all data necessary for the conduct of the study.
   1. Verify completeness of data supplied on the one-line diagram. Call any discrepancies to the attention of Engineer.
   2. For equipment provided that is Work of this Project, use characteristics submitted under the provisions of action submittals and information submittals for this Project.
   3. For relocated equipment and that which is existing to remain, obtain required electrical distribution system data by field investigation and surveys, conducted by qualified technicians and engineers. The qualifications of technicians and engineers shall be qualified as defined by NFPA 70E.
   4. Obtain all arc flash information from the local utility in a timely manner. No extension of the contract time shall be permitted due to coordination with the local utility.

B. Gather and tabulate the following input data to support the short-circuit study. Comply with recommendations in IEEE 551 as to the amount of detail that is required to be acquired in the field. Field data gathering shall be under the direct supervision and control of the engineer in charge of performing the study, and shall be by the engineer or its representative who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.
   1. Product Data for Project's overcurrent protective devices involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
   2. Obtain electrical power utility impedance at the service.
   3. Power sources and ties.
   4. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in percent, and phase shift.
   5. For reactors, provide manufacturer and model designation, voltage rating, and impedance.

6. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip, SCCR, current rating, and breaker settings.
7. Generator short-circuit current contribution data, including short-circuit reactance, rated kVA, rated voltage, and X/R ratio.
8. Busway manufacturer and model designation, current rating, impedance, lengths, and conductor material.
9. Motor horsepower and NEMA MG 1 code letter designation.
10. Cable sizes, lengths, number, conductor material and conduit material (magnetic or nonmagnetic).

3.2 SHORT-CIRCUIT STUDY

A. Perform study following the general study procedures contained in IEEE 399.

B. Calculate short-circuit currents according to IEEE 551.

C. Base study on the device characteristics supplied by device manufacturer.

D. The extent of the electrical power system to be studied is indicated on Drawings.

E. Begin short-circuit current analysis at the service, extending down to the system overcurrent protective devices as follows:
1. To normal system low-voltage load buses where fault current is 10 kA or less.
2. Exclude equipment rated 240-V ac or less when supplied by a single transformer rated less than 125 kVA.

F. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-switching configurations and alternate operations that could result in maximum fault conditions.

G. The calculations shall include the ac fault-current decay from induction motors, synchronous motors, and asynchronous generators and shall apply to low- and medium-voltage, three-phase ac systems. The calculations shall also account for the fault-current dc decrement, to address the asymmetrical requirements of the interrupting equipment.
1. For grounded systems, provide a bolted line-to-ground fault-current study for areas as defined for the three-phase bolted fault short-circuit study.

H. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault at each of the following:
1. Electric utility's supply termination point.
2. Incoming switchgear.
3. Unit substation primary and secondary terminals.
4. Low-voltage switchgear.
5. Motor-control centers.
6. Control panels.
7. Standby generators and automatic transfer switches.
8. Branch circuit panelboards.
9. Disconnect switches.

3.3 ADJUSTING

A. Make minor modifications to equipment as required to accomplish compliance with short-circuit study.

3.4 DEMONSTRATION

A. Train Owner's operating and maintenance personnel in the use of study results.

END OF SECTION

SECTION 26 05 73

OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes computer-based, overcurrent protective device coordination studies to determine overcurrent protective devices and to determine overcurrent protective device settings for selective tripping.

1.3 DEFINITIONS

A. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

B. One-Line Diagram: A diagram which shows, by means of single lines and graphic symbols, the course of an electric circuit or system of circuits and the component devices or parts used therein.

C. Protective Device: A device that senses when an abnormal current flow exists and then removes the affected portion from the system.

D. SCCR: Short-circuit current rating.

E. Service: The conductors and equipment for delivering electric energy from the serving utility to the wiring system of the premises served.

1.4 ACTION SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Other Action Submittals: Submit the following after the approval of system protective devices submittals. Submittals shall be in digital form.
   1. Coordination-study input data, including completed computer program input data sheets.
   2. Study and equipment evaluation reports.
   3. Overcurrent protective device coordination study report; signed, dated, and sealed by a qualified professional engineer.
      a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect for

preliminary submittal of sufficient study data to ensure that the selection of devices and associated characteristics is satisfactory.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Coordination Study Specialist and Field Adjusting Agency.

B. Product Certificates: For overcurrent protective device coordination study software, certifying compliance with IEEE 399.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For the overcurrent protective devices to include in emergency, operation, and maintenance manuals.
   1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
      a. The following parts from the Protective Device Coordination Study Report:
         1) One-line diagram.
         2) Protective device coordination study.
         3) Time-current coordination curves.
      b. Power system data.

1.7 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are unacceptable.

B. Coordination Study Software Developer Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.
   1. The computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.

C. Coordination Study Specialist Qualifications: Professional engineer in charge of performing the study and documenting recommendations, licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

D. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS

A. Software Developers:
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. SKM Systems Analysis, Inc.
   b. ETAP

B. Comply with IEEE 242 and IEEE 399.

C. Analytical features of device coordination study computer software program shall have the capability to calculate "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

D. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices and shall demonstrate selective coordination by computer-generated, time-current coordination plots.
   1. Optional Features:
   a. Arcing faults.
   b. Simultaneous faults.
   c. Explicit negative sequence.
   d. Mutual coupling in zero sequence.

2.2 PROTECTIVE DEVICE COORDINATION STUDY REPORT CONTENTS

A. Executive summary.

B. Study descriptions, purpose, basis and scope. Include case descriptions, definition of terms and guide for interpretation of the computer printout.

C. One-line diagram, showing the following:
   1. Protective device designations and ampere ratings.
   2. Cable size and lengths.
   3. Transformer kilovolt ampere (kVA) and voltage ratings.
   4. Motor and generator designations and kVA ratings.
   5. Switchgear, switchboard, motor-control center, and panelboard designations.

D. Study Input Data: As described in "Power System Data" Article.

E. Short-Circuit Study Output: As specified in "Short-Circuit Study Output" Paragraph in "Short-Circuit Study Report Contents" Article in Section 260572 "Overcurrent Protective Device Short-Circuit Study."

F. Protective Device Coordination Study:
   1. Report recommended settings of protective devices, ready to be applied in the field. Use manufacturer's data sheets for recording the recommended setting of overcurrent protective devices when available.

a. Phase and Ground Relays:
   1) Device tag.
   2) Relay current transformer ratio and tap, time dial, and instantaneous pickup value
   3) Recommendations on improved relaying systems, if applicable.
b. Circuit Breakers:
   1) Adjustable pickups and time delays (long time, short time, ground).
   2) Adjustable time-current characteristic.
   3) Adjustable instantaneous pickup.
   4) Recommendations on improved trip systems, if applicable.
c. Fuses: Show current rating, voltage, and class.

G. Time-Current Coordination Curves: Determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series, including power utility company's upstream devices. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation. Show the following information:

1. Device tag and title, one-line diagram with legend identifying the portion of the system covered.
2. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.
3. Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and instantaneous settings recommended.
4. Plot the following listed characteristic curves, as applicable:

a. Power utility's overcurrent protective device.
b. Medium-voltage equipment overcurrent relays.
c. Medium- and low-voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands.
d. Low-voltage equipment circuit-breaker trip devices, including manufacturer's tolerance bands.
e. Transformer full-load current, magnetizing inrush current, and ANSI through-fault protection curves.
f. Cables and conductors damage curves.
g. Ground-fault protective devices.
h. Motor-starting characteristics and motor damage points.
i. Generator short-circuit decrement curve and generator damage point.
j. The largest feeder circuit breaker in each motor-control center and panelboard.

5. Series rating on equipment allows the application of two series interrupting devices for a condition where the available fault current is greater than the interrupting rating of the downstream equipment. Both devices share in the interruption of the fault and selectivity is sacrificed at high fault levels. Maintain selectivity for tripping currents caused by overloads.
6. Provide adequate time margins between device characteristics such that selective operation is achieved.
7. Comments and recommendations for system improvements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance. Devices to be coordinated are indicated on Drawings.
   1. Proceed with coordination study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to coordination study may not be used in study.

3.2 PROTECTIVE DEVICE COORDINATION STUDY

A. Comply with IEEE 242 for calculating short-circuit currents and determining coordination time intervals.

B. Comply with IEEE 399 for general study procedures.

C. The study shall be based on the device characteristics supplied by device manufacturer.

D. The extent of the electrical power system to be studied is indicated on Drawings.

E. Begin analysis at the service, extending down to the system overcurrent protective devices as follows:
   1. To normal system low-voltage load buses where fault current is 10 kA or less.
   2. Exclude equipment rated 240-V ac or less when supplied by a single transformer rated less than 125 kVA.

F. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-switching configurations and alternate operations that could result in maximum fault conditions.

G. Transformer Primary Overcurrent Protective Devices:
   1. Device shall not operate in response to the following:
   a. Inrush current when first energized.
   b. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.
   c. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.
   2. Device settings shall protect transformers according to IEEE C57.12.00, for fault currents.

H. Motor Protection:
   1. Select protection for low-voltage motors according to IEEE 242 and NFPA 70.
   2. Select protection for motors served at voltages more than 600 V according to IEEE 620.

I. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and protection recommendations in IEEE 242. Demonstrate that equipment withstands the maximum short-circuit current for a time equivalent to the tripping

time of the primary relay protection or total clearing time of the fuse. To determine temperatures that damage insulation, use curves from cable manufacturers or from listed standards indicating conductor size and short-circuit current.

J. Generator Protection: Select protection according to manufacturer's written recommendations and to IEEE 242.

K. The calculations shall include the ac fault-current decay from induction motors, synchronous motors, and asynchronous generators and shall apply to low- and medium-voltage, three-phase ac systems. The calculations shall also account for the fault-current dc decrement, to address the asymmetrical requirements of the interrupting equipment.
   1. For grounded systems, provide a bolted line-to-ground fault-current study for areas as defined for the three-phase bolted fault short-circuit study.

L. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault and single line-to-ground fault at each of the following:
   1. Electric utility's supply termination point.
   2. Switchgear.
   3. Unit substation primary and secondary terminals.
   4. Low-voltage switchgear.
   5. Motor-control centers.
   6. Standby generators and automatic transfer switches.
   7. Branch circuit panelboards.

M. Protective Device Evaluation:
   1. Evaluate equipment and protective devices and compare to short-circuit ratings.
   2. Adequacy of switchgear, motor-control centers, and panelboard bus bars to withstand short-circuit stresses.

3.3 LOAD-FLOW AND VOLTAGE-DROP STUDY

A. Perform a load-flow and voltage-drop study to determine the steady-state loading profile of the system. Analyze power system performance two times as follows:
   1. Determine load-flow and voltage drop based on full-load currents obtained in "Power System Data" Article.
   2. Determine load-flow and voltage drop based on 80 percent of the design capacity of the load buses.
   3. Prepare the load-flow and voltage-drop analysis and report to show power system components that are overloaded, or might become overloaded; show bus voltages that are less than as prescribed by NFPA 70.

3.4 MOTOR-STARTING STUDY

A. Perform a motor-starting study to analyze the transient effect of the system's voltage profile during motor starting. Calculate significant motor-starting voltage profiles and analyze the effects of the motor starting on the power system stability.

B. Prepare the motor-starting study report, noting light flicker for limits proposed by IEEE 141 and voltage sags so as not to affect the operation of other utilization equipment on the system supplying the motor.

3.5 POWER SYSTEM DATA

A. Obtain all data necessary for the conduct of the overcurrent protective device study.
   1. Verify completeness of data supplied in the one-line diagram on Drawings. Call discrepancies to the attention of Engineer.
   2. For new equipment, use characteristics submitted under the provisions of action submittals and information submittals for this Project.
   3. For existing equipment, whether or not relocated obtain required electrical distribution system data by field investigation and surveys, conducted by qualified technicians and engineers. The qualifications of technicians and engineers shall be qualified as defined by NFPA 70E.

B. Gather and tabulate the following input data to support coordination study. The list below is a guide. Comply with recommendations in IEEE 551 for the amount of detail required to be acquired in the field. Field data gathering shall be under the direct supervision and control of the engineer in charge of performing the study, and shall be by the engineer or its representative who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.
   1. Product Data for overcurrent protective devices specified in other Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
   2. Electrical power utility impedance at the service.
   3. Power sources and ties.
   4. Short-circuit current at each system bus, three phase and line-to-ground.
   5. Full-load current of all loads.
   6. Voltage level at each bus.
   7. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in percent, and phase shift.
   8. For reactors, provide manufacturer and model designation, voltage rating, and impedance.
   9. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip and available range of settings, SCCR, current rating, and breaker settings.
   10. Generator short-circuit current contribution data, including short-circuit reactance, rated kVA, rated voltage, and X/R ratio.
   11. For relays, provide manufacturer and model designation, current transformer ratios, potential transformer ratios, and relay settings.
   12. Maximum demands from service meters.
   13. Busway manufacturer and model designation, current rating, impedance, lengths, and conductor material.
   14. Motor horsepower and NEMA MG 1 code letter designation.

15. Low-voltage cable sizes, lengths, number, conductor material, and conduit material (magnetic or nonmagnetic).
16. Medium-voltage cable sizes, lengths, conductor material, and cable construction and metallic shield performance parameters.
17. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram, showing the following:

a. Special load considerations, including starting inrush currents and frequent starting and stopping.
b. Transformer characteristics, including primary protective device, magnetic inrush current, and overload capability.
c. Motor full-load current, locked rotor current, service factor, starting time, type of start, and thermal-damage curve.
d. Generator thermal-damage curve.
e. Ratings, types, and settings of utility company's overcurrent protective devices.
f. Special overcurrent protective device settings or types stipulated by utility company.
g. Time-current-characteristic curves of devices indicated to be coordinated.
h. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.
i. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.
j. Panelboards, switchboards, motor-control center ampacity, and SCCR in amperes rms symmetrical.
k. Identify series-rated interrupting devices for a condition where the available fault current is greater than the interrupting rating of the downstream equipment. Obtain device data details to allow verification that series application of these devices complies with NFPA 70 and UL 489 requirements.

3.6 FIELD ADJUSTING

A. Adjust relay and protective device settings according to the recommended settings provided by the coordination study. Field adjustments shall be completed by the engineering service division of the equipment manufacturer under the Startup and Acceptance Testing contract portion.

B. Make minor modifications to equipment as required to accomplish compliance with short-circuit and protective device coordination studies.

C. Testing and adjusting shall be by a full-time employee of the Field Adjusting Agency, who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.
1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters. Perform NETA tests and inspections for all adjustable overcurrent protective devices.

3.7 DEMONSTRATION

A. Engage the Coordination Study Specialist to train Owner's maintenance personnel in the following:
   1. Acquaint personnel in the fundamentals of operating the power system in normal and emergency modes.
   2. Hand-out and explain the objectives of the coordination study, study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpreting the time-current coordination curves.
   3. Adjust, operate, and maintain overcurrent protective device settings.

END OF SECTION

SECTION 26 05 74

OVERCURRENT PROTECTIVE DEVICE ARC-FLASH STUDY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes a computer-based, arc-flash study to determine the arc-flash hazard distance and the incident energy to which personnel could be exposed during work on or near electrical equipment.

1.3 DEFINITIONS

A. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

B. One-Line Diagram: A diagram which shows, by means of single lines and graphic symbols, the course of an electric circuit or system of circuits and the component devices or parts used therein.

C. Protective Device: A device that senses when an abnormal current flow exists and then removes the affected portion from the system.

D. SCCR: Short-circuit current rating.

E. Service: The conductors and equipment for delivering electric energy from the serving utility to the wiring system of the premises served.

1.4 ACTION SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Other Action Submittals: Submit the following submittals after the approval of system protective devices submittals. Submittals shall be in digital form.
   1. Arc-flash study input data, including completed computer program input data sheets.
   2. Arc-flash study report; signed, dated, and sealed by a qualified professional engineer.
      a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect for preliminary submittal of sufficient study data to ensure that the selection of devices and associated characteristics is satisfactory.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Arc-Flash Study Specialist and Field Adjusting Agency.

B. Product Certificates: For arc-flash hazard analysis software, certifying compliance with IEEE 1584 and NFPA 70E.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance procedures according to requirements in NFPA 70E shall be provided in the equipment manuals.

B. Operation and Maintenance Procedures: In addition to items specified in Section 017823 "Operation and Maintenance Data," provide maintenance procedures for use by Owner's personnel that comply with requirements in NFPA 70E.

1.7 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are unacceptable.

B. Arc-Flash Study Software Developer Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.
   1. The computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.

C. Arc-Flash Study Specialist Qualifications: Professional engineer in charge of performing the study, analyzing the arc flash, and documenting recommendations, licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

D. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS

A. Software Developers:
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. SKM Systems Analysis, Inc.
b. ETAP

B. Comply with IEEE 1584 and NFPA 70E.

C. Analytical features of device coordination study computer software program shall have the capability to calculate "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

2.2 ARC-FLASH STUDY REPORT CONTENT

A. Executive summary.

B. Study descriptions, purpose, basis and scope.

C. One-line diagram, showing the following:
1. Protective device designations and ampere ratings.
2. Cable size and lengths.
3. Transformer kilovolt ampere (kVA) and voltage ratings.
4. Motor and generator designations and kVA ratings.
5. Switchgear, switchboard, motor-control center and panelboard designations.

D. Study Input Data: As described in "Power System Data" Article.

E. Short-Circuit Study Output: As specified in "Short Circuit Study Output" Paragraph in "Short-Circuit Study Report Contents" Article in Section 260572 "Overcurrent Protective Device Short-Circuit Study."

F. Protective Device Coordination Study Report Contents: As specified in "Protective Device Coordination Study Report Contents" Article in Section 260573 "Overcurrent Protective Device Coordination Study."

G. Arc-Flash Study Output:
1. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
a. Voltage.
b. Calculated symmetrical fault-current magnitude and angle.
c. Fault-point X/R ratio.
d. No AC Decrement (NACD) ratio.
e. Equivalent impedance.
f. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a symmetrical basis.
g. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total basis

H. Incident Energy and Flash Protection Boundary Calculations:
1. Arcing fault magnitude with and without required Arc Energy Reduction methods.
2. Protective device clearing time.

3. Duration of arc.
4. Arc-flash boundary.
5. Working distance.
6. Incident energy.
7. Hazard risk category.
8. Recommendations for arc-flash energy reduction.

I. Fault study input data, case descriptions, and fault-current calculations including a definition of terms and guide for interpretation of the computer printout.

2.3 ARC-FLASH WARNING LABELS

A. Comply with requirements in Section 260553 "Identification for Electrical Systems." Produce a 3.5-by-5-inch thermal transfer label of high-adhesion polyester for each work location included in the analysis.

B. The label shall have an orange header with the wording, "WARNING, ARC-FLASH HAZARD," and shall include the following information taken directly from the arc-flash hazard analysis:
1. Location designation.
2. Nominal voltage.
3. Flash protection boundary.
4. Hazard risk category.
5. Incident energy.
6. Working distance.
7. Engineering report number, revision number, and issue date.

C. Labels shall be machine printed, with no field-applied markings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine Project overcurrent protective device submittals. Proceed with arc-flash study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to arc-flash study may not be used in study.

3.2 ARC-FLASH HAZARD ANALYSIS

A. Comply with NFPA 70E and its Annex D for hazard analysis study.

B. Preparatory Studies:
1. Protective Device Coordination Study Report Contents: As specified in "Protective Device Coordination Study Report Contents" Article in Section 16402 "Overcurrent Protective Device Coordination Study."

C. Calculate maximum and minimum contributions of fault-current size.

1. The minimum calculation shall assume that the utility contribution is at a minimum and shall assume no motor load.
2. The maximum calculation shall assume a maximum contribution from the utility and shall assume motors to be operating under full-load conditions.

D. Calculate the arc-flash protection boundary and incident energy at locations in the electrical distribution system where personnel could perform work on energized parts.

E. Include medium- and low-voltage equipment locations, except equipment rated 240-V ac or less fed from transformers less than 125 kVA.

F. Safe working distances shall be specified for calculated fault locations based on the calculated arc-flash boundary, considering incident energy of 1.2 cal/sq.cm.

G. Incident energy calculations shall consider the accumulation of energy over time when performing arc-flash calculations on buses with multiple sources. Iterative calculations shall take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors and generators shall be decremented as follows:
1. Fault contribution from induction motors should not be considered beyond three to five cycles.
2. Fault contribution from synchronous motors and generators should be decayed to match the actual decrement of each as closely as possible (e.g., contributions from permanent magnet generators will typically decay from 10 per unit to three per unit after 10 cycles).

H. Arc-flash computation shall include both line and load side of a circuit breaker as follows:
1. When the circuit breaker is in a separate enclosure.
2. When the line terminals of the circuit breaker are separate from the work location.

I. Base arc-flash calculations on actual overcurrent protective device clearing time. Cap maximum clearing time at two seconds based on IEEE 1584, Section B.1.2.

3.3 POWER SYSTEM DATA

A. Obtain all data necessary for the conduct of the arc-flash hazard analysis.
1. Verify completeness of data supplied on the one-line diagram on Drawings and under "Preparatory Studies" Paragraph in "Arc-Flash Hazard Analysis" Article. Call discrepancies to the attention of Engineer.
2. For new equipment, use characteristics submitted under the provisions of action submittals and information submittals for this Project.
3. For existing equipment, whether or not relocated, obtain required electrical distribution system data by field investigation and surveys, conducted by qualified technicians and engineers.

B. Electrical Survey Data: Gather and tabulate the following input data to support study. Comply with recommendations in IEEE 1584 and NFPA 70E as to the amount of detail that is required to be acquired in the field. Field data gathering shall be under the direct

supervision and control of the engineer in charge of performing the study, and shall be by the engineer or its representative who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.

1. Product Data for overcurrent protective devices specified in other Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
2. Obtain electrical power utility impedance at the service.
3. Power sources and ties.
4. Short-circuit current at each system bus, three phase and line-to-ground.
5. Full-load current of all loads.
6. Voltage level at each bus.
7. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in per cent, and phase shift.
8. For reactors, provide manufacturer and model designation, voltage rating and impedance.
9. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip and available range of settings, SCCR, current rating, and breaker settings.
10. Generator short-circuit current contribution data, including short-circuit reactance, rated kVA, rated voltage, and X/R ratio.
11. For relays, provide manufacturer and model designation, current transformer ratios, potential transformer ratios, and relay settings.
12. Busway manufacturer and model designation, current rating, impedance, lengths, and conductor material.
13. Motor horsepower and NEMA MG 1 code letter designation.
14. Low-voltage cable sizes, lengths, number, conductor material and conduit material (magnetic or nonmagnetic).
15. Medium-voltage cable sizes, lengths, conductor material, and cable construction and metallic shield performance parameters.

3.4 LABELING

A. Apply one arc-flash label for 600-V ac, 480-V ac, and applicable 208-V ac panelboards and disconnects and for each of the following locations:

1. Motor-control center.
2. Low-voltage switchboard.
3. Switchgear.
4. Medium-voltage switch.
5. Control panel.

3.5 APPLICATION OF WARNING LABELS

A. Install the arc-fault warning labels under the direct supervision and control of the Arc-Flash Study Specialist.

3.6 DEMONSTRATION

A. Engage the Arc-Flash Study Specialist to train Owner's maintenance personnel in the potential arc-flash hazards associated with working on energized equipment and the significance of the arc-flash warning labels.

END OF SECTION

SECTION 26 20 00

SERVICE AND DISTRIBUTION

PART 1 GENERAL

1.1 SYSTEM VOLTAGE

A. The building service from the utility company shall be as indicated on the drawings. Distribution voltages, phases, wire configurations, grounding arrangements, and service characteristics shall be coordinated with the utility company and shown on the drawings.

B. Service and distribution equipment shall be rated for the voltage, phase, wire configuration, ampacity, and available fault current indicated on the drawings.

C. Contractor shall verify utility service characteristics, metering requirements, service entrance requirements, available fault current, and point of service with the utility company before ordering service equipment.

1.2 TERMINATIONS

A. Conductors and terminations shall comply with NEC 110.14 and the equipment manufacturer's listing and installation instructions.

B. Equipment terminals, lugs, and connectors shall be rated for 75°C conductors unless otherwise indicated or unless equipment listing requires a lower temperature rating.

C. Conductor ampacity shall be based on the temperature rating permitted by NEC 110.14(C) for the connected equipment terminals. Conductors shall not be sized using the 75°C ampacity column unless the equipment terminals and connected devices are listed and marked for 75°C conductors.

D. Conductors with insulation ratings higher than the termination temperature rating may be used for ampacity adjustment, correction, or both, where permitted by the NEC; however, final conductor ampacity shall not exceed the ampacity permitted by the lowest temperature rating of any connected termination, conductor, or device.

E. Terminals and lugs shall be listed for the conductor material used. Provide copper-only or copper/aluminum-rated lugs as required for the conductors indicated on the drawings.

PART 2 PRODUCTS

2.1 SAFETY SWITCHES

A. Furnish and install safety switches as shown on the Drawings. Safety switches shall be fused, heavy-duty, externally operated, enclosed safety switches complying with NEMA KS 1 and listed under UL 98. Switches shall be NEMA Heavy Duty Type HD unless otherwise

indicated.

B. Switches shall have blades that are fully visible in the “OFF” position with the door open. Switches shall be dead-front construction with permanently attached arc suppressors. Lugs shall be UL listed, front-removable where available, suitable for use with copper and aluminum conductors, and rated for 75°C conductors. All current-carrying parts shall be plated or otherwise protected to resist corrosion.

C. Switches shall be quick-make, quick-break type. During operation of the switch, the movable contacts shall not be capable of being restrained by the handle once the opening or closing action has been initiated. Switches shall have cover interlocks to prevent opening of the switch door while the switch is in the “ON” position and to prevent closing the switch with the door open. Switches shall be padlockable in the “OFF” position.

D. Switches shall be rated 600 V for 480 V systems and 240 V for 208Y/120 V systems unless otherwise indicated. Switches shall be horsepower-rated and suitable for use as motor disconnects where serving motor loads.

E. Provide NEMA Type 1 enclosures for dry indoor locations and NEMA Type 3R enclosures for outdoor or wet locations unless otherwise indicated. Provide NEMA Type 4, 4X, or 12 enclosures where indicated on the Drawings or required by the installed environment.

F. Switches used as service equipment shall be marked “Suitable for Use as Service Equipment” and shall include service-entrance barriers, bonding provisions, neutral assembly, and grounding provisions where required by the listing and applicable NEC requirements.

G. Provide neutral assemblies, equipment grounding kits, bonding jumpers, and lugs as required for the system shown on the drawings.

H. Approved Manufacturers:
1. Eaton
2. Square D (Schneider Electric)
3. ABB
4. Siemens

2.2 FUSES

A. Fuses shall be current-limiting, dual-element, time-delay type unless otherwise indicated on the Drawings or required by the equipment manufacturer. Fuses shall have an interrupting rating of 200,000 RMS symmetrical amperes minimum.

B. Fuses shall be sized as shown on the Drawings or as recommended by the equipment manufacturer. Fuses serving equipment shall be of the type and class specifically required by the equipment manufacturer.

C. Fuses for service-entrance equipment shall be Class L where required by ampere rating. Fuses for branch-circuit and feeder protection shall be Class RK5 dual-element time-delay

fuses unless Class RK1, Class J, or other fuse class is indicated on the Drawings or required by the equipment manufacturer.

D. Provide rejection-type fuse clips or manufacturer-listed rejection kits for Class R, Class J, or other current-limiting fuses where required by the fuse class, NEC requirements, or the specified short-circuit current rating.

E. Contractor shall furnish one spare set of fuses for each fuse type and ampere rating furnished on the project. Spare fuses shall be delivered to the Owner before acceptance of the project in labeled original packaging or in a labeled spare-fuse cabinet where indicated.

F. Approved Manufacturers:
   1. Eaton Bussmann
   2. Mersen
   3. Littelfuse

2.3 CIRCUIT BREAKER PANELBOARDS

A. Panelboards shall be sized as shown on the drawings and schedules. Panelboards shall be dead-front circuit breaker panelboards listed under UL 67, complying with NEMA PB 1 and NEC Article 408. Panelboards shall be bolt-on breaker type. Plug-on breakers shall not be permitted unless specifically indicated on the drawings.

B. Panelboards shall have copper phase and neutral buses and a copper equipment grounding bus. Panelboards shall have door-in-door trim. Provide fully distributed phase busing throughout. Any two adjacent single-pole breakers shall be replaceable by a two-pole breaker, and any three adjacent single-pole breakers shall be replaceable by a three-pole breaker.

C. All branch breakers shall be quick-make, quick-break, over-center toggle type with trip indication. Trip indication shall be clearly shown by the breaker handle taking a position between the “ON” and “OFF” positions. Multipole breakers shall have common trip. Handle ties shall not be used as a substitute for common-trip multipole breakers where common trip is required.

D. Circuit breakers shall be rated for operation in the installed ambient conditions. Where panelboards are installed in spaces with ambient temperatures exceeding 40°C, provide breakers and panelboards listed or manufacturer-rated for the actual ambient condition, or derate equipment in accordance with manufacturer’s instructions.

E. Minimum interrupting capacity of breakers shall be as shown on the panel schedules. No breaker shall be rated less than 10,000 RMS symmetrical amperes. Panelboard assembly short-circuit current rating shall not be less than the available fault current shown on the drawings at the point of installation.

F. Panelboards shall be fully rated. Series-rated combinations shall not be permitted unless specifically indicated on the drawings and approved by the Engineer.

G. Provide NEMA Type 1 enclosures for dry indoor locations and NEMA Type 3R enclosures for outdoor or wet locations unless otherwise indicated. Provide flush or surface mounting as indicated on the drawings.

H. Branch breakers shall be numbered 1, 3, 5, etc. from top to bottom beginning at the top of the left-hand column so that No. 1 shall be on phase A, No. 3 on phase B, and No. 5 on phase C.

I. Panelboards shall include main circuit breakers where indicated on the drawings or where required by NEC for panelboard overcurrent protection. Main-lug-only panelboards are permitted only where the feeder overcurrent protective device properly protects the panelboard and conductors. Provide main circuit breakers in the following conditions regardless of designation on the drawings:
   1. Panelboard is served from a transformer, utility or otherwise, and no overcurrent protective device exists between the transformer and the panelboard.
   2. Panelboard is served from a wireway and no overcurrent protective device exists between the wireway and the panelboard.

J. Provide typed circuit directories, engraved panel nameplates, and field-applied labels as required by the drawings and applicable codes. Directories shall identify the specific loads served and shall not use vague designations such as “spare,” “miscellaneous,” or “general” for active circuits.

F. Approved Manufacturers:
   1. Eaton
   2. Square D (Schneider Electric)
   3. ABB
   4. Siemens

2.4 DRY TYPE TRANSFORMERS

A. Contractor shall install dry type transformer(s) in the size and at the location(s) as shown on the drawings. Transformers will be used to step down voltage from 480 volts to 120/208 volts. Transformers shall comply with applicable DOE energy conservation standards in 10 CFR 431 for distribution transformers. Where NEMA TP-1 is referenced, it shall be understood as a minimum historical benchmark and shall not supersede current federal efficiency requirements.

B. Transformers shall have the KVA ratings shown on the drawings. Transformers shall be three phase type rated for 480 volts primary and 120/208 volt secondary as shown on the drawings. Transformers shall be self-cooled.

C. Temperature rise shall not exceed 150°C above a 40°C ambient at full continuous kVA load with a minimum 200°C temperature-class insulation system.

D. Stacked transformers, where permitted by the drawings and specifically listed or manufacturer-approved for stacked installation, shall have a temperature rise not exceeding 80°C above ambient and shall be installed with manufacturer-required clearances,

ventilation, mounting hardware, and seismic/bracing provisions where applicable.

E. Average sound level shall not exceed the limits of NEMA ST 20 for the applicable kVA rating and temperature-rise class.

F. Transformers shall have four external type taps, two 2-1/2% FCBN and two 2-1/2% FCAN. Windings shall be copper.

G. Transformers rated larger than 112.5KVA shall be provided with Class 155 or higher insulation system and shall be completely enclosed except for ventilating openings. Transformers larger than 112.5KVA shall comply with NEC Article 450.21(B) Exception No. 2, to allow transformers to be installed inside non fire rated rooms.

H. Transformers shall be floor-mounted on isolation pads unless otherwise indicated on the drawings or specifically approved for wall or suspended mounting.

I. Enclosure shall be heavy gauge steel with ventilation openings protected against falling dirt and drip, and shall be shielded against actual touching of live parts. A nameplate in accordance with NEMA standards shall be permanently affixed to the enclosure.

J. Approved Manufacturers:
1. Eaton
2. Square D (Schneider Electric)
3. ABB
4. Siemens

PART 3 EXECUTION

3.1 COORDINATION

A. Contractor shall coordinate all service and distribution work with other crafts on the project.

B. Coordinate equipment locations, housekeeping pads, working clearances, access, feeder routing, conduit entries, utility service requirements, available fault current, and manufacturer installation requirements with all affected trades.

C. Coordinate switchboard, panelboard, transformer, disconnect switch, and feeder installations with architectural, structural, mechanical, plumbing, fire protection, and utility requirements before rough-in or equipment procurement.

3.2 FIELD TESTING

A. Before energizing equipment, Contractor shall inspect, test, and verify that electrical service and distribution equipment is installed properly and in accordance with the drawings, specifications, manufacturer’s instructions, and applicable codes.

B. At such times as the Architect or Engineer directs, Contractor shall conduct operating tests in the presence of the Architect, Engineer, or Owner's representative. Contractor shall furnish instruments, test equipment, and personnel required for such tests.

C. Field testing shall include, at minimum, visual and mechanical inspection, verification of equipment ratings and nameplates, verification of fuse and circuit breaker sizes, torque verification of accessible electrical connections, phase rotation checks, voltage checks, operation of disconnects and circuit breakers, and verification of interlocks and accessories.

D. Test ground-fault protection systems, where provided, in accordance with manufacturer's instructions and applicable NEC requirements. Submit written test reports documenting test procedures, results, deficiencies, corrective actions, and final acceptance.

E. Work found to be defective, or materials found to vary from the requirements of the drawings or specifications, shall be corrected or replaced by the Contractor without additional cost to the Owner.

3.3 EMERGENCY AND STANDBY CIRCUITS

A. Wiring for emergency systems shall be installed in raceways independent of all other circuits and conductors, except where specifically permitted by NEC Article 700. Emergency system wiring shall comply with NEC Article 700, including wiring separation requirements of NEC 700.10.

B. Wiring for legally required standby systems and optional standby systems shall comply with NEC Articles 701 and 702, respectively, where such systems are included in the project.

C. Do not mix emergency, legally required standby, optional standby, and normal power conductors in the same raceway, cable, box, or cabinet except where specifically permitted by the applicable NEC article.

3.4 INSTALLATION

A. Install service and distribution equipment in accordance with the drawings, specifications, manufacturer's written instructions, equipment listing, and applicable NEC requirements.

B. Provide field-applied labels and markings required by NEC, utility requirements, and the drawings. Service equipment in other than dwelling units shall be field marked with available fault current and the date the calculation was performed in accordance with NEC 110.24.

C. Where emergency, legally required standby, or optional standby power sources are provided, place signs at service-entrance equipment indicating the type and location of each on-site power source in accordance with applicable NEC Articles 700, 701, or 702.

D. Where an optional standby generator is provided, place a sign at the service-entrance equipment indicating the type and location of each on-site optional standby power source in accordance with NEC 702.7.

E. Disconnecting means shall be provided for each motor and motor controller and shall be located within sight from the controller, motor, and driven machinery locations in accordance with NEC 430.102, except where otherwise permitted by the NEC.

F. Maintain required working clearances, dedicated electrical space, access, ventilation clearances, and service clearances for all service and distribution equipment.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Receptacles, receptacles with integral GFCI, and associated device plates.
   2. Tamper-proof receptacles.
   3. Twist-locking receptacles.
   4. Snap switches and wall-box dimmers.
   5. Wall-box motion sensors.
   6. Wall-switch occupancy sensors and time switches.

1.3 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. PVC: Polyvinyl chloride.

D. RFI: Radio-frequency interference.

E. TVSS: Transient voltage surge suppressor.

F. UTP: Unshielded twisted pair.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.
   1. Receptacles, switches, plates, floor outlets, poke through assemblies, service poles and multioutlet assemblies.

B. Samples: One for each type of device and wall plate specified, in each color specified.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of wiring device through one source from a single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NFPA 70 latest edition or edition enforced by state or local code authority.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Receptacles: Duplex 125 V, 20 A:
   a. Hubbell - HBL 5362.
   b. Leviton Mfg. Company Inc.-5362.
   c. Pass & Seymour-CRB5362.
   d. Pass & Seymour -PT5362A (Plug Tail Device).
2. GFI Receptacles: Weather Resistant 125 V, 20 A:
   a. Hubbell Incorporated- BR20WR
   b. Leviton Mfg. Company Inc.-WBR20
   c. Pass & Seymour- WR5362.
3. GFI Receptacles: Weather Resistant and Tamper Resistant 125 V, 20 A:
   a. Hubbell - BR2WRTR.
   b. Leviton Mfg. Company Inc.-TWR20
   c. Pass & Seymour- WR20TR.
4. Receptacles: Tamper Resistant 125 V, 20 A:
   a. Hubbell - BR20TR.
   b. Leviton Mfg. Company Inc.-TWR20
   c. Pass & Seymour- TR5362.
5. Switches-Single Pole:
   a. Hubbell- HBL 1221.
   b. Pass & Seymour - PS20AC1.
   c. Leviton Mfg. Company, Inc.- 1221-1
6. Switches-Three Pole:
   a. Hubbell- HBL1223
   b. Leviton Mfg. Company, Inc.-1223-2.
   c. Pass & Seymour-PS20AC3.
7. Switches – Occupancy Sensor Wall Type:
   a. Hubbell - LH-MT
   b. Leviton - OD15-ID
   c. Sensor Switch - WSD-PD
   d. Watt Stopper - WA-200
8. Switches – Key Operated / Security Switches:
   a. Hubbell - HBL1221RKL.
   b. Leviton - 1221-2KL
   c. Pass & Seymour - PS20AC1-KL.
9. Dimmer Switches Line Voltage:
   a. Lutron Nova T

b. Pass & Seymour CD2000

* Dimmer must be compatible with Ballast or LED Driver.

10. Dimmer Switches 0-10V:
    a. Synergy ISD
    b. Cooper SF10P

* Dimmer must be compatible with Ballast or LED Driver.

2.2 RECEPTACLES

A. Straight-Blade-Type Receptacles: Comply with UL 498, 20 amp.

B. Straight-Blade and Locking Receptacles: Heavy-Duty grade 20 amp.

C. GFCI Receptacles: Straight blade, feed-through type, Heavy-Duty grade, with integral NEMA WD 6, Configuration 5-20R duplex receptacle; complying with UL 498 and UL 943. Design units for installation in a 2-3/4-inch- (70-mm-) deep outlet box without an adapter.

D. Tamper resistant in all areas.

2.3 CORD AND PLUG SETS

A. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.
    1. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and equipment-rating ampacity plus a minimum of 30 percent.
    2. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.4 SWITCHES

A. Single- and Double-Pole Switches: Comply with UL 20, 20 amp.

B. Snap Switches: Heavy-Duty grade, quiet type 20 amp, 120/277 volt.

C. Live Voltage Dimmer: 120V, 2000 watt, slide to-off. Dimmer must be compatible with ballast or driver.

D. 0-10V Dimmer: 120/277VAC, capable of three way, max wattage 1200 w 120VAC, 150000 277 VAC, Dimmer must be compatible with ballast or driver. 100% to 1% continuous.

2.5 WALL PLATES

A. Single and combination types to match corresponding wiring devices.
    1. Plate-Securing Screws: Metal with head color to match plate finish.
    2. Material for Finished Spaces: As selected by Architect.
    3. Material for Unfinished Spaces: Galvanized steel.

4. Material for Wet Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."

B. Wet-Location, Weatherproof Cover Plates:
1. NEMA 250, complying with type 3R weather-resistant while-in-use metalor impact-resistant thermoplastic with lockable cover; non-removable gasket between the mounting plate/base and cover; stainless steel hinges and mounting hardware

2.6 SPECIAL CONFIGURATION & TWIST-LOCKING RECEPTACLES

A. General: NEMA and Non-NEMA configurations as indicated on Drawings.
1. Comply with NEMA WD 1, NEMA WD 6; and UL 498.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Hubbell
b. Leviton
c. Pass & Seymour

2.7 FINISHES

A. Color:
1. Wiring Devices Connected to Normal Power System: As selected by Architect, unless otherwise indicated or required by NFPA 70.2.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install devices and assemblies level, plumb, and square with building lines.

B. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

C. Remove wall plates and protect devices and assemblies during painting.

D. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

E. Install weather resistant receptacles in damp and wet locations per N.E.C. requirements.

F. Mounting Heights: Comply with applicable codes and requirements of Authorities Having Jurisdiction. Mount devices as indicated on Drawings, including but not limited to Architectural elevations. Coordinate all above counter receptacles with backsplash to avoid interferences. All dimensions are given to centerline of box above finished floor (AFF), unless otherwise indicated.

G. Device Plates and Covers:

1. Do not use oversized or extra-deep plates.
2. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
3. Install weather-proof-while-in-use covers over receptacles in wet, damp and exterior locations.
4. Group adjacent devices under single, multigang wall plates.

H. Floor Service Outlets, Service Poles and Poke-Thru Device
1. Adjust locations of floor service outlets, service poles, and Poke-Thru devices to suit arrangement of partitions and furnishings. Coordinate revised location with Structural Engineer.

3.2 APPLICATION

A. GFCI Receptacles: Install in locations as indicated but in no case less than those listed below:
1. Where device is located on the exterior of the building, provide with Wet-Location Weatherproof Cover Plate.
2. Where device is located within the garage.
3. Where device is located in an elevator pit.
4. Where device is located within 6 feet (2-m) of a lavatory or sink

3.3 CONNECTIONS

A. Ground equipment according to Division 26 Section "Grounding and Bonding."

B. Connect wiring according to Division 26 Section "Conductors and Cables."

C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values.

3.4 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:
1. After installing wiring devices and after electrical circuitry has been energized, test for proper polarity, ground continuity, and compliance with requirements.
2. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.

B. Remove malfunctioning units, replace with new units, and retest as specified above.

3.5 CLEANING

A. On completion of wall plate installation, inspect exterior surfaces and perform the following:
1. Remove paint splatters and other spots.
2. Remove all temporary markings and labels.
3. Replace cracked or damaged wall plates.

4. Wipe down all wall plates with approve cleaning agent to remove fingerprints and dust.

END OF SECTION

SECTION 26 32 13

DIESEL GENERATOR SETS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes packaged engine-generator sets suitable for use in mission critical applications with the features as specified and indicated. Engine generators will be used as the Standby power source for the system, but shall be capable of providing reliable power with no run-time limitations while the primary source of power is unavailable.

1.3 DEFINITIONS

A. Emergency Standby Power (ESP): Per ISO 8528: The maximum power available during a variable electrical power sequence, under the stated operating conditions, for which a generating set is capable of delivering in the event of a utility power outage or under test conditions for up to 200 hours of operation per year with the maintenance intervals and procedures being carried out as prescribed by the manufacturers. The permissible average power output (Ppp) over 24 hours of operation shall not exceed 70 percent of the ESP unless otherwise agreed by the RIC engine manufacturer.

B. Prime Power (PRP): Per ISO 8528: The maximum power which a generating set is capable of delivering continuously whilst supplying a variable electrical load when operated for an unlimited number of hours per year under the agreed operating conditions with the maintenance intervals and procedures being carried out as a prescribed by the manufacturer. The permissible average power output (Ppp) over 24 hours of operation shall not exceed 70 percent of the PRP unless otherwise agreed by the RIC engine manufacturer.

C. Limited Time running Power (LTP): Per ISO 8528: The maximum power available, under the agreed operating conditions, for which the generating set is capable of delivering for up to 500 hours of operation per year with the maintenance intervals and procedures being carried out as prescribed by the manufacturers.

D. Continuous Operating Power (COP): Per ISO 8528: The maximum power which a generating set is capable of delivering continuously whilst supplying a constant electrical load when operated for an unlimited number of hours per year under the agreed operating conditions with the maintenance intervals and procedures being carried out as a prescribed by the manufacturer.

E. Data Center Continuous (DCC): The maximum power which a generating set is capable of delivering continuously whilst supplying a variable or constant electrical load when operated for an unlimited number of hours in a data center application

under the agreed operating conditions with the maintenance intervals and procedures being carried out as a prescribed by the manufacturer. The permissible average power output (Ppp) over 24 hours of operation shall not exceed 100 percent of the DCC rating.

F. Operational Bandwidth: The total variation from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of packaged engine generator indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. In addition, include the following:
   1. Thermal damage curve for generator.
   2. Time-current characteristic curves for generator protective device.
   3. Sound test data, based on a free field requirement.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, and location and size of each field connection.
   1. Dimensioned outline plan and elevation drawings of engine-generator set and other components specified.
   2. Wiring Diagrams: Control interconnection, Customer connections.

C. Certifications:
   1. Submit statement of compliance which states the proposed product(s) is certified to the emissions standards required by the location for EPA, stationary emergency application.

1.5 INFORMATIONAL SUBMITTALS

A. Source quality-control test reports.
   1. Certified summary of prototype-unit test report. See requirements in Part 2 "Source Quality Control" Article Part A. Include statement indicating torsional compatibility of components.
   2. Certified Test Report: Provide certified test report documenting factory test per the requirements of this specification, as well as certified factory test of generator set sensors per NFPA 110 level 1.
   3. List of factory tests to be performed on units to be shipped for this Project.
   4. Report of exhaust emissions and compliance statement certifying compliance with applicable regulations.

B. Warranty:
   1. Submit manufacturer’s warranty statement to be provided for this Project.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Manufacturer Qualifications: A qualified manufacturer. Maintain, a service center capable of providing training, parts, and emergency maintenance repairs. Center shall be capable of responding to site within 4 hours of notification.

C. Source Limitations: Obtain packaged generator sets and auxiliary components through one source from a single manufacturer.

D. Comply with NFPA 37 (Standard For the Installation and Use of Stationary Combustion Engines and Gas Turbines).

E. Comply with NFPA 70 (National Electrical Code. Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702).

F. Comply with NFPA 110 (Emergency and Standby Power Systems) requirements for Level 1 emergency power supply system.

G. Comply with UL 2200.

1.7 PROJECT CONDITIONS

A. Environmental Conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:
   1. Ambient Temperature: 4.44 deg C (40.0 deg F) to 51.11 deg C (124.0 deg F).
   2. Relative Humidity: 0 to 95 percent.
   3. Altitude: Sea level to 60.0 feet (18.29 m).

1.8 WARRANTY

A. Base Warranty: Manufacturer shall provide base warranty coverage on the material and workmanship of the generator set for a minimum of twenty-four (24) months for Standby product and twelve (12) months for Prime/Continuous product from registered commissioning and start-up.

B. Extended Warranty: Manufacturer shall offer extend coverage of 5 years from date of registered commissioning and start-up.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: The following are approved for use on this project all others shall submit for prior approval.
   1. Cummins Power Generation
   2. MTU
   3. Taylor Power
   4. Caterpillar

2.2 ENGINE-GENERATOR SET

A. Factory-assembled and -tested, engine-generator set.

B. Mounting Frame: Maintain alignment of mounted components without depending on concrete foundation; and have lifting attachments.
   1. Rigging Information: Indicate location of each lifting attachment, generator-set center of gravity, and total package weight in submittal drawings.

C. Capacities and Characteristics:
1. Power Output Ratings: Electrical output power rating for Standby operation of not less than KW illustrated on plan, at 80 percent lagging power factor. Refer to drawings for voltage and output breaker requirements.

2. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component. The engine-generator nameplate shall include information of the power output rating of the equipment.

D. Generator-Set Performance:
1. Steady-State Voltage Operational Bandwidth: 1 percent of rated output voltage from no load to full load.
2. Transient Voltage Performance: Not more than 10 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within 0.5 seconds.
3. Steady-State Frequency Operational Bandwidth: 0.25 percent of rated frequency from no load to full load.
4. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
5. Transient Frequency Performance: Not more than 10 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within 3 seconds.
6. Output Waveform: At full load, harmonic content measured line to line or line to neutral shall not exceed 2 percent total with no slot ripple. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50.
7. Sustained Short-Circuit Current: For a 3-phase, bolted short circuit at system output terminals, system shall supply a minimum of 300 percent of rated full-load current for not less than 8 seconds without damage to generator system components. For a 1-phase, bolted short circuit at system output terminals, system shall regulate both voltage and current to prevent over-voltage conditions on the non-faulted phases.
8. Start Time: Comply with NFPA 110, Level 1, Type 10, system requirements.
9. Ambient Condition Performance: Engine generator shall be designed to allow operation at full rated load in an ambient temperature under site conditions, based on highest ambient condition. Ambient temperature shall be as measured at the air inlet to the engine generator for enclosed units, and at the control of the engine generator for machines installed in equipment rooms.

2.3 ENGINE

A. Fuel: ASTM D975 #2 Diesel Fuel

B. Rated Engine Speed: 1800 RPM.

C. Lubrication System: The following items are mounted on engine or skid:
1. Lube oil pump: shall be positive displacement, mechanical, full pressure pump.
2. Filter and Strainer: Provided by the engine manufacturer of record to provide adequate filtration for the prime mover to be used.

3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.

D. Engine Fuel System: The engine fuel system shall be installed in strict compliance to the engine manufacturer's instructions

E. Main Fuel Pump: Mounted on engine. Pump ensures adequate primary fuel flow under starting and load conditions.
   1. Coolant Jacket Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity and performance.
   2. Heater voltage and phase shall be shown on the project drawings. Where integral panelboards are illustrated it shall be pre-wired at 208V 1Ø or 120V 1Ø.
   3. Installed with isolation valves to isolate the heater for replacement of the element without draining the engine cooling system or significant coolant loss.
   4. Provided with a 24VDC thermostat, installed at the engine thermostat housing

F. Governor: Adjustable isochronous, with speed sensing. The governing system dynamic capabilities shall be controlled as a function of engine coolant temperature to provide fast, stable operation at varying engine operating temperature conditions. The control system shall actively control the fuel rate as appropriate to the state of the engine generator. Fuel rate shall be regulated as a function of starting, accelerating to start disconnect speed, accelerating to rated speed, and operating in various isochronous states.

G. Cooling System: Closed loop, liquid cooled
   1. The generator set manufacturer shall provide prototype test data for the specific hardware proposed demonstrating that the machine will operate at rated standby load in an outdoor ambient condition of 40 deg C.
   2. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
   3. Size of Radiator overflow tank: Adequate to contain expansion of total system coolant from cold start to 110 percent load condition.
   4. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gage glass and petcock.
   5. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
   6. Duct Flange: Generator sets installed indoors shall be provided with a flexible radiator duct adapter flange.

H. Muffler/Silencer: Selected with performance as required to meet sound requirements of the application, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure

requirements. For generator sets with outdoor enclosures the silencer shall be inside the enclosure.

I. Air-Intake Filter: Engine-mounted air cleaner with replaceable dry-filter element and restriction indicator.

J. Starting System: 12 or 24V, as recommended by the engine manufacturer; electric, with negative ground.
   1. Components: Sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum specified in Part 1 "Project Conditions" Article.
   2. Cranking Cycle: As required by NFPA 110 for level 1 systems.
   3. Battery Cable: Size as recommended by engine manufacturer for cable length as required. Include required interconnecting conductors and connection accessories.
   4. Battery Compartment: Factory fabricated of metal with acid-resistant finish.
   5. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation. The battery charging alternator shall have sufficient capacity to recharge the batteries with all parasitic loads connected within 4 hours after a normal engine starting sequence.
   6. Battery Chargers: Unit shall comply with UL 1236, provide fully regulated, constant voltage, current limited, battery charger for each battery bank. It will include the following features:
      a. Operation: Equalizing-charging rate based on generator set manufacturer's recommendations shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.
      b. Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 20 deg C to plus 40 deg C to prevent overcharging at high temperatures and undercharging at low temperatures.
      c. Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.
      d. Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.
      e. Provide LED indication of general charger condition, including charging, faults, and modes. Provide a LCD display to indicate charge rate and battery voltage. Charger shall provide relay contacts for fault conditions as required by NFPA 110.
      f. Enclosure and Mounting: NEMA, Type 1, wall-mounted cabinet.

2.4 FUEL OIL STORAGE

A. Comply with NFPA 30.

B. Day Tank (INDOOR or LOCATED IN HOUSING): Comply with UL 142, freestanding, factory-fabricated fuel tank assembly, with integral, float-controlled transfer pump and the following features:
   1. Allocation: A separate day tank shall be provided for each engine generator
   2. Containment: Integral rupture basin with a capacity of 150 percent of nominal capacity of day tank.
      a. Leak Detector: Locate in rupture basin and connect to provide audible and visual alarm in the event of day-tank leak.
   3. Tank Capacity: As recommended by engine manufacturer for an uninterrupted period operation at 100 percent of rated power output of engine-generator system without being refilled. Refer to drawings for minimum run time requirements.
   4. Pump Capacity: Minimum 2 GPM with 20 foot lift, driven by ¼ HP, 120/240V 1-phase motor.
   5. Control: Provided with On/Off/Emergency run switch, Test/Reset Switch, AC Circuit Breaker, DC Circuit Breaker, and the following indicator lamps:
      a. Ready (Green) – AC Supply and DC Control Power Available.
      b. High Fuel (Red) – Latching fault, indicates fuel level near overflow, shuts down pump, and closes N/O dry contacts.
      c. Low Fuel (Red) – Latching fault, indicates pump failure or operating float switch failure, closes N/O dry contacts.
      d. Low Fuel Shutdown (Red) – Latching fault, indicates near empty tank, closes N/O contacts which may be used to shutdown engine generator to avoid air in the injection system.
      e. Overflow To Basin (Red) – Latching fault, indicates fuel in overflow/rupture basin, shuts down pump, closes N/O dry contacts
      f. Spare (Red) – with N/O and N/C dry contacts
      g. Pump Running (Green)
   6. Piping Connections: Factory-installed fuel supply and return lines from tank to engine; local fuel fill, and vent lines in compliance with local code requirements.

2.5 CONTROL AND MONITORING

A. Engine generator control shall be microprocessor based and provide automatic starting, monitoring, protection and control functions for the unit.

B. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of generator set. When mode-selector switch is switched to the on position, generator set starts. The off position of same switch initiates generator-set shutdown. (Switches with different configurations but equal functions are acceptable.) When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of the local (generator set-mounted) and/or remote emergency-stop switch also shuts down generator set.

C. Manual Starting System Sequence of Operation: Switching on-off switch on the generator control panel to the on position starts generator set. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of the local (generator set-mounted) and/or remote emergency-stop switch also shuts down generator set.

D. Configuration: Operating and safety indications, protective devices, system controls, engine gages and associated equipment shall be grouped in a common control and monitoring panel. Mounting method shall isolate the control panel from generator-set vibration. AC output power circuit breakers and other output power equipment shall not be mounted in the control enclosure.

E. Indicating and Protective Devices and Controls: As required by NFPA 110 for Level 1 system, and the following:
   1. AC voltmeter (3-phase, line to line and line to neutral values).
   2. AC ammeter (3-phases).
   3. AC frequency meter.
   4. AC kW output (total and for each phase). Display shall indicate power flow direction.
   5. AC kVA output (total and for each phase). Display shall indicate power flow direction.
   6. AC Power factor (total and for each phase). Display shall indicate leading or lagging condition.
   7. Ammeter-voltmeter displays shall simultaneously display conditions for all three phases.
   8. Emergency Stop Switch: Switch shall be a red "mushroom head" pushbutton device complete with lock-out/tag-out provisions. Depressing switch shall cause the generator set to immediately stop the generator set and prevent it from operating.
   9. Fault Reset Switch: Supply a dedicated control switch to reset/clear fault conditions.
   10. DC voltmeter (alternator battery charging).
   11. Engine-coolant temperature gauge.
   12. Engine lubricating-oil pressure gauge.
   13. Running-time meter.
   14. Generator-voltage and frequency digital raise/lower switches. Rheostats for these functions are not acceptable. The control shall adjustment of these parameters in a range of plus or minus 5% of the voltage and frequency operating set point (not nominal voltage and frequency values.) The voltage and frequency adjustment functions shall be disabled when the paralleling breaker is closed.
   15. Fuel tank derangement alarm.
   16. Fuel tank high-level shutdown of fuel supply alarm.
   17. AC Protective Equipment: The control system shall include over/under voltage, reverse kVAR, reverse kW, over load (kW) short circuit, over current, loss of voltage reference, and over excitation shut down protection. There shall be a ground fault alarm for generator sets rated over 1000 amps, overload warning, and overcurrent warning alarm.
   18. Status LED indicating lamps to indicate remote start signal present at the control, existing shutdown condition, existing alarm condition, not in auto, and generator set running.
   19. A graphical display panel with appropriate navigation devices shall be provided to view all information noted above, as well as all engine status and alarm/shutdown conditions (including those from an integrated engine emission control system). The display shall also include integrated provisions for adjustment of the gain and stability settings for the governing and voltage regulation systems.

20. Panel lighting system to allow viewing and operation of the control when the generator room or enclosure is not lighted.
21. Data Logging: The control system shall log the latest 20 different alarm and shut down conditions, the total number of times each alarm or shutdown has occurred, and the date and time the latest of these shutdown and fault conditions occurred.
22. DC control Power Monitoring: The control system shall continuously monitor DC power supply to the control, and annunciate low or high voltage conditions. It shall also provide an alarm indicating imminent failure of the battery bank based on degraded voltage recover on loading (engine cranking).

F. Remote Alarm Annunciator: Comply with NFPA 110. An LED labeled with proper alarm conditions shall identify each alarm event and a common audible signal shall sound for each alarm condition.

G. Remote Emergency-Stop Switch: Flush; wall mounted, unless otherwise indicated; and labeled. Push button shall be protected from accidental operation.

2.6 GENERATOR OVERCURRENT AND FAULT PROTECTION

A. Generator Overcurrent Protection: The generator set shall be provided with a UL Listed/CSA Certified protective device that is coordinated with the alternator provided to prevent damage to the generator set on any possible overload or overcurrent condition external to the machine. The protective device shall be listed as a utility grade protective device under UL category NRGU. The control system shall be subject to UL follow-up service at the manufacturing location to verify that the protective system is fully operational as manufactured. Protector shall perform the following functions:
1. Initiates a generator kW overload alarm when generator has operated at an overload equivalent to 110 percent of full-rated load for 60 seconds. Indication for this alarm is integrated with other generator-set malfunction alarms.
2. Under single phase or multiple phase fault conditions, or on overload conditions, indicates an alarm conditions when the current flow is in excess of 110% of rated current for more than 10 seconds.
3. Under single phase or multiple phase fault conditions, operates to switch off alternator excitation at the appropriate time to prevent damage to the alternator.
4. The operator panel shall indicate the nature of the fault condition as either a short circuit or an overload.
5. Senses clearing of a fault by other overcurrent devices and controls recovery of rated voltage to avoid overshoot greater than 120% of nominal voltage.
6. The protective system provided shall not include an instantaneous trip function.

2.7 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

A. Comply with NEMA MG 1.

B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.

C. Electrical Insulation: Class H

D. Temperature Rise: 105 / Class F environment.

E. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, over speed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.

F. Permanent Magnet Generator (PMG) shall provide excitation power for optimum motor starting and short circuit performance.

G. Enclosure: Drip-proof.

H. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified. The voltage regulation system shall be microprocessor-controlled, 3-phase true RMS sensing, full wave rectified, and provide a pulse-width modulated signal to the exciter. No exceptions or deviations to these requirements will be permitted.

I. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

J. Sub transient Reactance: 12 percent maximum, based on the rating of the engine generator set.

2.8 OUTDOOR GENERATOR-SET ENCLOSURE

A. Description: Sound Attenuated Aluminum housing. Multiple panels shall be lockable and provide adequate access to components requiring maintenance. Instruments, control, and battery system shall be mounted within enclosure.

B. Construction:
1. Louvers: Equipped with bird screen to permit air circulation when engine is not running while excluding birds and rodents.
2. Hinged Doors: With padlocking provisions. Restraint/Hold back hardware to prevent door to keep door open at 180 degrees during maintenance. Rain lips over all doors.
3. Exhaust System:
a. Muffler Location: Within enclosure.

4. Hardware: All hardware and hinges shall be stainless steel.
5. Wind Rating: Wind rating shall be 150 mph unless otherwise indicated on drawings.
6. Mounting Base: Suitable for mounting on sub-base fuel tank or housekeeping pad.
7. A weather protective enclosure shall be provided which allows the generator set to operate at full rated load with a static pressure drop equal to or less than 0.5 inches of water.
8. Inlet ducts shall include rain hoods

C. Engine Cooling Airflow through Enclosure: Housing shall provide ample airflow for engine generator operation at rated load in an ambient temperature of 40 deg C.
1. Louvers: Fixed-engine, cooling-air inlet and discharge.
2. Motorized Louvers: At engine cooling-air inlet and discharge. Dampers shall be closed to reduce enclosure heat loss in cold weather when unit is not operating. Dampers shall be of a “fail open” design to allow airflow in the event of failure

D. Sound Performance: Reduce the sound level of the engine generator while operating at full rated load to a maximum dBA measured at any location 23 ft from the engine generator in a free field environment. Refer to drawings for maximum dBA.

E. Electrical Provisions
1. Compliance with NEC: Package shall comply with the requirements of the National Electrical Code for all wiring materials and component spacing.
2. When an integral panel is indicated on plan an internally mounted and wired electrical distribution panel to serve the engine generator and enclosure shall be provided; including:
a. 100 amp distribution panelboard connected to a 120/240VAC utility service by the installer.
b. Two duplex GFI receptacles, one inside the enclosure, and a weatherproof receptacle on the outside of the enclosure.
c. Factory wired normal AC service from the panelboard to the engine coolant heater, alternator heater, and battery charger.

d. Interior Lights with Switch: Two three-way switches controlling three AC lamps mounted in vapor tight and gasketed fixtures

3. External Electrical Connections: All power and control interconnections shall be made within the perimeter of the enclosure.

F. Site Provisions:
1. Lifting: Complete assembly of engine generator, enclosure, and sub base fuel tank (when used) shall be designed to be lifted into place as a single unit, using spreader bars.

2.9 VIBRATION ISOLATION DEVICES

A. Vibration Isolation: Generators installed on grade shall be provided with elastomeric isolator pads integral to the generator, unless the engine manufacturer requires use of spring isolation.
1. IBC Compliance: Isolators complying with IBC requirements shall be specified in the equipment documentation, as well as the installation requirements for the unit.

2.10 FINISHES

A. Indoor and Outdoor Enclosures and Components: Powder-coated and baked over corrosion-resistant pretreatment and compatible primer. Manufacturer's standard color or as directed on the drawings.

2.11 SOURCE QUALITY CONTROL

A. Prototype Testing: Factory test engine-generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.
1. Tests: Comply with NFPA 110, Level 1 Energy Converters. In addition, the equipment engine, skid, cooling system, and alternator shall have been subjected to actual prototype tests to validate the capability of the design under the abnormal conditions noted in NFPA 110. Calculations and testing

on similar equipment which are allowed under NFPA 110 are not sufficient to meet this requirement.

B. Project-Specific Equipment Tests: Before shipment, factory test engine-generator set manufactured specifically for this Project. Perform tests at rated load and power factor. Include the following tests:
   1. Test engine generator set manufactured for this Project to demonstrate compatibility and functionality.
   2. Full load run.
   3. Maximum power.
   4. Voltage regulation.
   5. Steady-state governing.
   6. Single-step load pickup.
   7. Simulated safety shutdowns.
   8. Provide 14 days' advance notice of tests and opportunity for observation of tests by Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with packaged engine-generator manufacturers' written installation, application, and alignment instructions and with NFPA 110.

B. Equipment shall be installed by the contractor in accordance with final submittals and contract documents. Installation shall comply with applicable state and local codes as required by the authority having jurisdiction. Install equipment in accordance with manufacturer's instructions and instructions included in the listing or labeling of UL listed products.

C. Installation of equipment shall include furnishing and installing all interconnecting wiring between all major equipment provided for the on-site power system. The contractor shall also perform interconnecting wiring between equipment sections (when required), under the supervision of the equipment supplier.

D. Contractor shall coordinate remote pushbutton location (when required) with engineer prior to installation. Provide allowance for 75’ of conduit and required cabling unless otherwise located on plans.

E. Equipment shall be installed on concrete housekeeping pads. Equipment shall be permanently fastened to the pad in accordance with manufacturer’s instructions and seismic requirements of the site.

F. Equipment shall be initially started and operated by representatives of the manufacturer. All protective settings shall be adjusted as instructed by the consulting engineer.

G. All equipment shall be physically inspected for damage. Scratches and other installation damage shall be repaired prior to final system testing. Equipment shall be thoroughly cleaned to remove all dirt and construction debris prior to initial operation and final testing of the system.

H. On completion of the installation by the electrical contractor, the generator set supplier shall conduct a site evaluation to verify that the equipment is installed per manufacturer's recommended practice.

3.2 ON-SITE ACCEPTANCE TEST

A. The complete installation shall be tested to verify compliance with the performance requirements of this specification following completion of all site work. Testing shall be conducted by representatives of the manufacturer, with required fuel supplied by Contractor. The Engineer shall be notified in advance and shall have the option to witness the tests. The generator set manufacturer shall provide a site test specification covering the entire system. Tests shall include:

B. Prior to start of active testing, all field connections for wiring, power conductors, and bus bar connections shall be checked for proper tightening torque.

C. Installation acceptance tests to be conducted on site shall include a "cold start" test, a two hour full load (resistive) test, and a one-step rated load pickup test in accordance with NFPA 110. Provide a resistive load bank and make temporary connections for full load test, if necessary.

D. Perform a power failure test on the entire installed system. This test shall be conducted by opening the power supply from the utility service, and observing proper operation of the system for at least 2 hours. Coordinate timing and obtain approval for start of test with site personnel.

3.3 TRAINING

A. The equipment supplier shall provide training for the facility operating personnel covering operation and maintenance of the equipment provided. The training program shall be not less than 4 hours in duration and the class size shall be limited to 5 persons. Training date shall be coordinated with the facility owner.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

3.5 SERVICE AND SUPPORT

A. The generator set supplier shall maintain service parts inventory for the entire power system at a central location which is accessible to the service location 24 hours per day, 365 days per year. The inventory shall have a commercial value of $3 million or more. The manufacturer of the generator set shall maintain a central parts inventory to support the supplier, covering all the major components of the power system, including engines, alternators, control systems, paralleling electronics, and power transfer equipment.

B. The generator set shall be serviced by a local service organization that is trained and factory certified in generator set service. The supplier shall maintain an inventory of critical power system replacement parts in the local service location. Service vehicles shall be stocked with critical replacement parts. The service organization shall be on

call 24 hours per day, 365 days per year. The service organization shall be physically located within 2 hours of the site.

C. The manufacturer shall maintain model and serial number records of each generator set provided for at least 20 years.

END OF SECTION

SECTION 26 36 23

AUTOMATIC TRANSFER SWITCHES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes transfer switches rated 600 V and less, including the following:
   1. Automatic transfer switches
   2. Remote annunciation systems

B. Related Sections include the following:

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, weights, operating characteristics, furnished specialties, and accessories.
   1. Technical data on all major components of all transfer switches and other products described in this section. Data is required for the transfer switch mechanism, control system, cabinet, and protective devices specifically listed for use with each transfer switch. Include steady state and fault current ratings, weights, operating characteristics, and furnished specialties and accessories.
   2. Single Line Diagram: Show connections between transfer switch, power sources and load.

B. Shop Drawings: Dimensioned plans, elevations, sections, and details showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each switch specified.
   1. Dimensioned outline drawings of assembly, including elevations, sections, and details including minimal clearances, conductor entry provisions, gutter space, installed features and devices and material lists for each switch specified.
   2. Internal electrical wiring and control drawings.
   3. Interconnection wiring diagrams, showing recommended conduit runs and point-to-point terminal connections to generator set.
   4. Installation and mounting instructions, including information for proper installation of equipment to meet seismic requirements.

C. Manufacturer and Supplier Qualification Data
   1. The transfer switch manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation, and service, in accordance with ISO 9001.
   2. The manufacturer of this equipment shall have produced similar equipment for a minimum period of 10 years. When requested, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this

requirement.

D. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
   1. Features and operating sequences, both automatic and manual.
   2. List of all factory settings of relays, timers and protective devices; provide setting and calibration instructions where applicable.

E. Warranty documents demonstrating compliance with the project's contract requirements.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: The equipment supplier shall maintain a service center capable of providing training, parts, maintenance and emergency repairs to equipment, including transfer switch generator sets and remote monitoring equipment (if applicable) at the site within a response period of less than eight hours time of notification.
   1. The transfer switch shall be serviced by technicians employed by, and specially trained and certified by, the generator set supplier and the supplier shall have a service organization that is factory-certified in both generator set and transfer switch service. The supplier shall maintain an inventory of critical replacement parts at the local service organization, and in service vehicles. The service organization shall be on call 24 hours per day, 365 days per year.
   2. Submit names, experience level, training certifications, and locations for technicians that will be responsible for servicing equipment at this site.
   3. The manufacturer shall maintain model and serial number records of each transfer switch provided for at least 20 years.

B. Source Limitations: All transfer switches are to be obtained through one source from a single manufacturer. The generator set manufacturer shall warrant transfer switches to provide a single source of responsibility for products provided.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked as suitable for use in emergency, legally required or optional standby use as appropriate for the connected load.

D. The automatic transfer switch installation and application shall conform to the requirements of the following codes and standards:
   1. Transfer switches and enclosures shall be UL 1008 listed and labeled as suitable for use in emergency, legally required, and optional standby applications.
   2. CSA 282, Emergency Electrical Power Supply for Buildings, and CSA C22.2, No. 14-M91 Industrial Control Equipment
   3. NFPA 70, National Electrical Code. Equipment shall be suitable for use in systems in compliance with Articles 700, 701 and 702.
   4. Comply with NEMA ICS 10-1993 AC Automatic Transfer Switches
   5. IEEE 446 – Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
   6. EN55011, Class B Radiated Emissions and Class B Conducted Emissions
   7. IEC 1000-4-5 (EN 61000-4-5); AC Surge Immunity
   8. IEC 1000-4-4 (EN 61000-4-4) Fast Transients Immunity

9. IEC 1000-4-2 (EN 61000-4-2) Electrostatic Discharge Immunity
10. IEC 1000-4-3 (EN 61000-4-3) Radiated Field Immunity
11. IEC 1000-4-6 Conducted Field Immunity
12. IEC 1000-4-11 Voltage Dip Immunity
13. IEEE 62.41, AC Voltage Surge Immunity
14. IEEE 62.45, AC Voltage Surge Testing

E. Comply with NFPA 110 – Emergency and Standby Power Systems. The transfer switch shall meet all requirements for Level 1 systems, regardless of the actual circuit level.

F. The manufacturer shall warrant the material and workmanship of the transfer switch equipment for a minimum of five (5) year from the warranty start date. The warranty start date is the date of registered commissioning and start up or eighteen (18) months from date of shipment, whichever is sooner.

G. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, and etc. during the minimum noted warranty period described above.

1.5 COORDINATION

A. Size and location of concrete bases and anchor bolt inserts shall be coordinated. Concrete, reinforcement and formwork must meet the requirements specified in Division 03. See section "INSTALLATION" for additional information on installation

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cummins Power Generation
2. ASCO
3. Trystar (Docking stations & Manual Transfer Switches)

B. Switches manufactured by other manufacturers that meet the requirement of this specification are acceptable, if approved not less than two weeks before scheduled bid date. Proposals must include a line-by-line compliance statement based on this specification.

C. Transfer switches utilizing molded case circuit breakers do not meet the requirements of this specification and will not be accepted.

2.2 GENERAL TRANSFER-SWITCH PRODUCT REQUIREMENTS

A. Provide transfer switches in the number and ratings that are shown on the drawings.

B. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer.

C. Fault-Current Closing and Withstand Ratings: UL 1008 WCR ratings must be

specifically listed as meeting the requirements for use with protective devices at installation locations, under specified fault conditions. Withstand and closing ratings shall be based on use of the same set of contacts for the withstand test and the closing test.

D. Solid-State Controls: All settings should be accurate to +/- 2% or better over an operating temperature range of - 40 to + 60 degrees C (- 40 to + 140 degrees F).

E. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.

F. Electrical Operation: Accomplished by a non-fused, momentarily energized solenoid or electric motor operator mechanism, mechanically and electrically interlocked in both directions (except that mechanical interlock is not required for closed transition switches).

G. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.
   1. Switches using molded-case switches or circuit breakers, or insulated case circuit breaker components are not acceptable.
   2. Transfer switches shall be double-throw, electrically and mechanically interlocked, and mechanically held in the Source 1 and Source 2 positions.
   3. Main switch contacts shall be high pressure silver alloy. Contact assemblies shall have arc chutes for positive arc extinguishing. Arc chutes shall have insulating covers to prevent inter-phase flashover.
   4. Contacts shall be operated by a high-speed electrical mechanism that causes contacts to open or close within three electrical cycles from signal.
   5. Transfer switch shall be provided with flame retardant transparent covers to allow viewing of switch contact operation but prevent direct contact with components that could be operating at line voltage levels.
   6. The transfer switch shall include the mechanical and control provisions necessary to allow the device to be field-configured for operating speed. Transfer switch operation with motor loads shall be as is recommended in NEMA MG1.
      a. Phase angle monitoring/timing equipment is not an acceptable substitute for this functionality
   7. Transfer switches designated on the drawings as “4-pole” shall be provided with a switched neutral pole switched which is switched simultaneously with phase poles.
   8. Transfer switches designated on the drawings as "service entrance" switches shall meet the requirements of section "SERVICE ENTRANCE TRANSFER SWITCHES" of this specification.

H. Control: Transfer switch control shall be capable of communicating with the genset control, other switches and remote programming devices over a high-speed network interface.

I. Factory wiring: Transfer switch internal wiring shall be composed of pre-manufactured harnesses that are permanently marked for source and destination. Harnesses shall be connected to the control system by means of locking disconnect plug(s), to allow the control system to be easily disconnected and serviced without disconnecting power from

the transfer switch mechanism

J. Terminals: Terminals shall be pressure type and appropriate for all field wiring. Control wiring shall be equipped with suitable lugs, for connection to terminal strips.

K. Enclosures: All enclosures shall be third-party certified for compliance to NEMA ICS 6 and UL 508, unless otherwise indicated:
   1. The enclosure shall provide wire bend space in compliance to the latest version of NFPA70, regardless of the direction from which the conduit enters the enclosure.
   2. Exterior cabinet doors shall provide complete protection for the system's internal components. Doors must have permanently mounted key-type latches. Bolted covers or doors are not acceptable.
   3. Transfer switches shall be provided in enclosures that are third party certified for their intended environment per NEMA requirements.
   4. Indoor transfer switches shall be NEMA-1. Outdoor transfer switches shall be NEMA-3R.

2.3 AUTOMATIC TRANSFER SWITCHES

A. Comply with requirements for Level 1 equipment according to NFPA 110.

B. Indicated current ratings:
   1. Refer to the Project drawings for specifications on the sizes and types of transfer switch equipment, withstand and closing ratings, number of poles, voltage and ampere ratings, enclosure type, and accessories.
   2. Main contacts shall be rated for 600 VAC minimum.
   3. Transfer switches shall be rated to carry 100% of rated current continuously in the enclosure supplied, in ambient temperatures of -40 to +60 degrees C (-40 to +140 degrees F), relative humidity up to 95% (non-condensing), and altitudes up to 10,000 feet (3000 meters).

C. Relay Signal: Control shall include provisions for addition of a pre-transfer relay signal, adjustable from 0 to 60 seconds, to be provided if necessary for elevator operation, based on equipment provided for the project.

D. Control: Transfer switch control shall be provided with necessary equipment and software to communicate with the genset control, other transfer switches, remote annunciation equipment, and other devices over a high speed control network.

E. Neutral Switching: Transfer switches designated on the drawings as 4-pole shall be provided with a switched neutral pole. The neutral pole shall be of the same construction and have the same ratings as the phase poles. All poles shall be switched simultaneously using a common crossbar. Substitute equipment using overlapping neutral contacts is not acceptable.

F. Automatic Transfer Switch Control Features
   1. The transfer switch control system shall be configurable in the field for any operating voltage level up to 600 VAC. Voltage sensing shall be monitored based on the normal voltage at the site. Systems that utilize voltage monitoring based on standard voltage conditions that are not field configurable are not acceptable.

2. All transfer switch sensing shall be configurable from an operator panel or from a Windows 10 or later PC-based service tool. Designs utilizing DIP switches or other electromechanical devices are not acceptable.
3. The transfer switch shall be configurable to accept a relay contact signal and a network signal from an external device for load shedding purposes. On receipt of this signal, the transfer switch shall switch to a neutral position when connected to Source 2. If Source 1 is available when the load-shed signal is received, the transfer switch shall connect to Source 1.
4. The transfer switch shall be configurable to accept a relay contact signal and a network signal from an external device to prevent transfer to the generator service.
5. The transfer switch shall provide a relay contact signal prior to transfer or re-transfer. The time period before and after transfer shall be adjustable in a range of 0 to 60 seconds.
6. The control system shall be designed and prototype tested for operation in ambient temperatures from - 40 degrees C to + 60 degrees C (- 40 to +140 degrees F). It shall be designed and tested to comply with the requirements of the noted voltage and RFI/EMI standards.
7. The control shall have optically isolated logic inputs, high isolation transformers for AC inputs and relays on all outputs, to provide optimum protection from line voltage surges, RFI and EMI.
8. The transfer switch network monitoring equipment, when supplied, shall be provided with a battery-based auxiliary power supply to allow monitoring of the transfer switch when both AC power sources are non-operational.

G. Transfer Switch Control Panel: The transfer switch shall have a microprocessor-based control with a sealed membrane panel incorporating pushbuttons for operator-controlled functions, and LED lamps for system status indicators. The panel shall also include an alphanumeric display for detailed system information. Panel display and indicating lamps shall include permanent labels.
1. The indicator panel LEDs shall display:
    a. Which source the load is connected to (Source 1 or Source 2)
    b. Which source or sources are available
    c. When switch is not set for automatic operation, the control is disabled
    d. When the switch is in test/exercise mode
2. The indicator shall have pushbuttons that allow the operator to activate the following functions:
    a. Activate pre-programmed test sequence
    b. Override programmed delays, and immediately go to the next operation
    c. Reset the control by clearing any faults
    d. Test all of the LEDs by lighting them simultaneously
3. The alphanumeric digital display shall be vacuum fluorescent-type, clearly visible in both bright sunlight and no-light conditions over an angle of 120 degrees, and shall display the following:
    a. AC voltage for all phases, normal and emergency
    b. Source status: connected or not connected.
    c. Load data, including voltage, AC current, frequency, KW, KVA, and power factor.
4. The display panel shall be password-protected, and allow the operator to view and make adjustments:
    a. Set nominal voltage and frequency for the transfer switch
    b. Adjust voltage and frequency sensor operation set points

c. Set up time clock functions
d. Set up load sequence functions
e. Enable or disable control functions including program transition
f. View real-time clock data, operation log (hours connected, times transferred, failures) and service history

H. Control Functions: Functions managed by the control shall include:
1. Software adjustable time delays:
a. Engine start (prevents nuisance genset starts in the event of momentary power fluctuation): 0 to 120 seconds (default 3 sec)
b. Transfer normal to emergency (allows genset to stabilize before load is transferred): 0 to 120 seconds (default 3 sec)
c. Re-transfer emergency to normal (allows utility to stabilize before load is transferred from genset): 0 to 30 minutes (default 3 sec)
d. Engine cooldown: 0 to 30 minutes (default 10 min)
e. Programmed transition: 0 to 60 seconds (default 3 sec)
2. Voltage imbalance sensing:
a. Dropout: 2 to 10% (default 4%)
b. Pickup: 90% of dropout
c. Time delay: 2.0 to 20 seconds (default 5 sec)
d. Bar graph meter panel, to display 3-phase AC Amps, 3-phase AC Volts, Hz, KW load level, and load power factor. The display shall be color-coded, with green scale indicating normal or acceptable operating level, yellow indicating conditions nearing a fault, and red indicating operation in excess of rated conditions for the transfer switch.
3. Phase rotation sensing:
a. Time delay: 100 msec
4. Loss of single-phase detection:
a. Time delay: 100 msec

I. Control features shall include:
1. Programmable genset exerciser: A field-programmable control shall periodically start and run the generator with or without transferring the load for a preset time period, then re-transfer and shut down the generator after a preset cool-down period.
2. In event of a loss of power to the control, all control settings, real-time clock setting and the engine start-time delay setting will be retained.
3. The system continuously logs information including the number of hours each source has been connected to the load, the number of times transferred, and the total number of times each source has failed. An event recorder stores information, including time and date-stamp, for up to 50 events.
4. Re-Transfer Inhibit Switch: Inhibits automatic re-transfer control so automatic transfer switch will remain connected to emergency power source as long as it is available regardless of condition of normal source.
5. Transfer Inhibit Switch: Inhibits automatic transfer control so automatic transfer switch will remain connected to normal power source regardless of condition of emergency source.

J. Control Interface
1. Provide one set Form C auxiliary contacts on both sides, operated by transfer switch position, rated 10 amps 250 VAC.
2. The transfer switch shall be provided with a network communication card, and

configured to allow network-based communication with the transfer switch and other network system components, including the generator set(s) provided for the Project.

3. Unassigned Auxiliary Contacts: Two normally open, 1-pole, double-throw contacts for each switch position, rated 10A at 240 VAC.

K. Engine Starting Contacts

1. One isolated and normally closed pair of contacts rated 10A at 32 VDC minimum.

2.4 REMOTE ANNUNCIATOR SYSTEM

A. Functional Description: Remote annunciator panel shall annunciate conditions for indicated transfer switches. Annunciation shall include the following:

1. Sources available, as defined by actual pickup and dropout settings of transfer-switch controls.
2. Switch position.
3. Switch in test mode.
4. Failure of communication link.

B. Annunciator Panel: LED-lamp type with audible signal and silencing switch.

1. Indicating Lights: Grouped for each transfer switch monitored.
2. Label each group, indicating transfer switch it monitors, location of switch, and identity of load it serves.
3. Switch in test mode.
4. Lamp Test: Push-to-test or lamp-test switch on front panel.

C. Malfunction of annunciator or communication link shall not affect functions of automatic transfer switch. In the event of failure of communication link, automatic transfer switch automatically reverts to stand-alone, self-contained operation.

D. Automatic transfer-switch sensing, controlling, or operating function shall not depend on remote panel for proper operation. The remote annunciation system shall not prevent transfer to the alternate source when the primary power source fails, nor prevent return to the primary source if the alternate source fails

2.5 MANUAL TRANSFER SWITCHES (MTS)

A. The transfer switch unit shall be manually operated and mechanically held. The switch shall be mechanically interlocked to ensure only one of three possible positions, Source 1, Source 2, or Center Off Fused disconnect type switches shall not be acceptable.

B. The switch shall be positively locked and unaffected by momentary outages so that contact pressure is maintained at a constant value and temperature rise at the contacts is minimized for maximum reliability and operating life.

C. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented blow-on construction for high withstand current capability and be protected by separate arcing contacts.

D. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors.

E. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof which are not intended for continuous duty, repetitive switching or transfer between two active power sources are not acceptable.

F. Where neutral conductors must be switched, the MTS shall be provided with fully- rated neutral transfer contacts.

G. Where neutral conductors are to be solidly connected, a neutral terminal plate with fully-rated AL-CU pressure connectors shall be provided.

H. The MTS shall be tested in accordance with UL 1008 for transfer switches. Switch ratings of 260 amperes and less shall have endurance rating of 6000 cycles, 400 ampere shall have endurance rating of 4000 cycles, and 600 – 1200 ampere shall have endurance rating of 3000 cycles.

I. Operation:
1. The transfer switch shall be arranged for manually actuated manual operation.
2. The manual transfer shall be actuated via a mechanical operating mechanism.
3. The manual operating handle shall be capable of external operation without opening the enclosure door.
4. It shall have the same contact to contact speed as automatic operation
5. There shall be three positions for manual operation:
    a. Connected to Source 1 (preferred)
    b. Connected to Source 2 (alternate)
    c. Connect to center off (disconnected position)
6. Switch position when connected to Source 1, or Source 2 shall be pad – lockable

J. Additional Features:
1. Mechanical position indicators (yellow) visible to the operator shall be included for Source 1 (preferred), Source 2, (alternate), and Center Off (disconnected).
2. LED indicators for Source 1 (preferred), and Source 2 (alternate).
3. Auxiliary position indicating contacts, rated 10 amps, 250 Vac shall be provided consisting of one closed when the MTS is connected to Source 1 (preferred), and one contact closed when the MTS is connected to Source 2 (alternate)
4. A form A contact shall be provided to indicate switch is in the Center Off (disconnected) position.
5. Auxiliary Contacts: Position indicating contacts, rated 10 amps, 250 Vac shall be provided consisting of two closed when the MTS is connected to Source 1 (preferred), and two contact closed when the MTS is connected to Source 2 (alternate).
6. Integrated Quick Connects: contains quick connects which provide a connecting means for connecting a portable generator.
    a. Quick connects shall be located on Source 2 (emergency):
        i. For 400A and below models, there shall be one (1) row of up to five (5) series single pole connections.
        ii. For 600A - 800A models, there shall be two (2) rows of up to five (5) single pole connections.
        iii. For 1000A-1200A models, there shall be three (3) rows of up to 5 single pole connections.
    b. All electrical connections shall be 16 cam type single pole connectors, available color coded as per industry standard practice.

K. Withstand and Closing Ratings:

1. The MTS shall be rated to close on and withstand the available RMS symmetrical short circuit current at the MTS terminals with the type of overcurrent protection shown on the plans. WCR MTS ratings @ 480v shall be as follows when used with specific circuit breakers or current limiting fuses:

MTS Ampacity	Withstand & Closing Rating MCCB	W/CLF
150-600	50,000A	200,000
800-1200	65,000A	200,000

PART 3 - EXECUTION

3.1 INSTALLATION

A. Design each fastener and support to carry load indicated by seismic requirements and according to seismic-restraint details. See Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

B. Floor-Mounting Switch: Anchor to floor by bolting.

1. Floor-mounted transfer switches (except drawout switches supported by wheeled carriages, which must be rolled out at floor level) shall be mounted on concrete bases complying with the following requirements:

a. Concrete Bases: 4 inches (100 mm) high, reinforced, with chamfered edges. Extend base no more than 4 inches (100 mm) in all directions beyond the maximum dimensions of switch, unless otherwise indicated or unless required for seismic support. Construct concrete bases according to Division 26 Section "Hangers and Supports for Electrical Systems." Where Section “Hangers and supports for Electrical Systems.” Is not included in the spec book refer to Division 26 Section “Basic Electrical Requirements”.

C. Annunciator Panel Mounting: Flush in wall, unless otherwise indicated.

D. Identify components according to Division 26 Section "Identification for Electrical Systems." Where section “Identification for Electrical Systems” is not included in the spec book refer to Division 26 section “Basic Electrical Requirements”

E. Set field-adjustable intervals and delays, relays, and engine exerciser clock.

3.2 CONNECTIONS

A. Wiring to Remote Components: Match type and number of cables and conductors to control and communication requirements of transfer switches as recommended by manufacturer. Increase raceway sizes at no additional cost to Owner if necessary to accommodate required wiring.

B. Field control connections shall be made on a common terminal block that is clearly and permanently labeled.

C. Transfer switch shall be provided with AL/CU mechanical lugs sized to accept the full output rating of the switch. Lugs shall be suitable for the number and size of conductors

shown on the drawings.

D. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems." Where section “Grounding and Bonding for Electrical Systems” is not included in the spec book refer to Division 26 section “Basic Electrical Requirements”

E. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables." Where section “Grounding and Bonding for Electrical Systems” is not included in the spec book refer to Division 26 section “Basic Electrical Requirements”

3.3 SOURCE QUALITY CONTROL

A. Prior to shipping, factory shall test and inspect components, assembled switches, and associated equipment to ensure proper operation.

B. Factory shall check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements.

C. Factory shall perform dielectric strength test complying with NEMA ICS 1.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: The supplier of the transfer switch(es) and associated equipment shall inspect, test, and adjust components, assemblies, and equipment installations, including connections, and report results in writing.

B. Manufacturer’s representative shall perform tests and inspections and prepare test reports.

C. After installing equipment and after electrical circuitry has been energized, installer shall test for compliance with requirements.
   1. Perform recommended installation tests as recommended in manufacturer’s installation and service manuals.
   2. After energizing circuits, demonstrate interlocking sequence and operational function for each switch.
      a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
      b. Verify time-delay settings.
      c. Verify that the transfer switch is accurately metering AC voltage and current.
      d. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.

D. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switch. Remove all access panels so joints and connections are accessible to portable scanner.
   1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switch 11 months after date of Substantial Completion.

2. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
3. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 DEMONSTRATION

A. After generator set installation, the generator and transfer switch supplier shall conduct a complete operation, basic maintenance, and emergency service seminar covering generator set and transfer switch equipment, for up to 10 people employed by the Owner.
1. The seminar shall include instruction on operation of the transfer equipment, normal testing and exercise, adjustments to the control system, use of the PC based service and maintenance tools provided under this contract, and emergency operation procedures.
2. The class duration shall be at least 8 hours in length, and include practical operation with the installed equipment.

3.6 SERVICE AND SUPPORT

A. The manufacturer shall supply the Service Provider with a complete set of the service and maintenance software required to support the product. The software shall be provided at a training class attended by the user, to qualify the user in proper use of the software. The software shall have the following features and capabilities:
1. The software shall allow adjustment of all functions described herein, adjustment of operating levels of all protective functions, and programming of all optional functions in the controller. Adjustments shall be possible over modem from a facility that is remote from the generator set.
2. The software shall be capable of storing and displaying data for any function monitored by the generator set control. This data shall be available in common file formats, and on graphical “strip chart” displays.
3. The software shall automatically record all control operations and adjustments performed by any operator or software user, for tracking of changes to the control.
4. The software shall display all warning, shutdown, and status changes programmed into transfer switch controller. For each event, the control shall provide information on the nature of the event, when it last occurred, and how many times it has occurred.

END OF SECTION

SECTION 26 43 13

TVSS FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes field-mounted SPDs for low-voltage (120 to 600 V) power distribution and control equipment.

1.3 DEFINITIONS

A. I-nominal: Nominal discharge current.

B. MCOV: Maximum continuous operating voltage.

C. Mode(s), also Modes of Protection: The pair of electrical connections where the VPR applies.

D. MOV: Metal-oxide varistor; an electronic component with a significant non-ohmic current-voltage characteristic.

E. OCPD: Overcurrent protective device.

F. SCCR: Short-circuit current rating.

G. SPD: Surge protective device.

H. VPR: Voltage protection rating.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
   2. Copy of UL Category Code VZCA certification, as a minimum, listing the tested values for VPRs, I nominal ratings, MCOVs, type designations, OCPD requirements, model numbers, system voltages, and modes of protection.
   3. Copies of test reports from a recognized independent testing laboratory, capable of producing 200kA surge current waveforms, verifying the suppressor can survive published surge current rating on a per mode basis using the ANSI/IEEE C62.41 impulse waveform C3 (8 x 20 microsecond, 20kV/10kA). Test data on an individual module is not acceptable. In house testing will not be accepted.

4. Copy of warranty statement clearly establishing the terms and conditions to the building/facility owner/operator.

1.5 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

B. Sample Warranty: For manufacturer's special warranty.

C. Testing: Third Party Independent Testing

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For SPDs to include in maintenance manuals.

1.7 WARRANTY

A. Manufacturer's Warranty: The SPD system shall have a limited product warranty when installed in compliance with applicable national/local electrical codes and manufacturer's installation manual.
   1. Warranty Period: Twenty (20) years from date of Substantial Completion. - TYPE "C"
   2. Warranty Period: Fifteen (15) years from date of Substantial Completion. - TYPE "A" &"B"

PART 2 PRODUCTS

2.1 GENERAL SPD REQUIREMENTS

A. SPD with Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Comply with UL 1449.

D. MCOV of the SPD shall be the nominal system voltage. MCOV shall be a tested value per section 37.7.3 of UL1449 4th Edition.

2.2 SERVICE ENTRANCE AND TRANSFER SWITCH SUPRESSOR (TYPE C)

A. Basis of Design: Subject to compliance with requirements. Provide comparable product to the following:
   1. Current Technology "SL3" Series.
   2. Approved equivalent provided all specification requirements met within. Submission package must be received by engineer two weeks prior to bid date shall fully comply with all performance characteristics included in this specification.

B. SPDs: Listed as Type 1 SPD per UL1449 4th Edition
   1. SPDs with the following features and accessories:
      a. Integral disconnect switch (where breaker not provided).
      b. Internal thermal protection that disconnects the SPD before damaging internal suppressor components.
      c. Indicator light display for protection status.
      d. Form-C contacts: one normally open and one normally closed, for remote monitoring of protection status, and Advanced monitoring with status, surge counter and history log of events.

C. Comply with UL 1283 with a maximum attenuation of 54dB based on 50ohm insertion loss test per MIL-STD-220B

D. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per mode shall not be less than 200 kA (400kA per phase). The peak surge current rating shall NOT be the arithmetic sum of the ratings of the individual MOVs in a given mode. SPD manufacturer shall provide independent 3rd party testing validating unit is capable of surviving a single surge at the specified rating or up to and not to exceed 200,000 kA.

E. Protection modes and UL 1449 VPR for grounded wye circuits with 480Y/277V or 208Y/120V, three-phase, four-wire circuits shall not exceed the following:
   1. Line to Neutral: [1200 V for 480Y/277 V] [700 V for 208Y/120 V].
   2. Line to Ground: [1200 V for 480Y/277 V] [700 V for 208Y/120 V].
   3. Line to Line: [1800 V for 480Y/277 V] [1200 V for 208Y/120 V].

F. Protection modes and UL 1449 VPR for 240/120 V, single-phase, three-wire circuits shall not exceed the following:
   1. Line to Neutral: 700 V.
   2. Line to Ground: [700 V] [1000 V].
   3. Line to Line: 1200 V.

G. SCCR: Equal or exceed 200 kA.

H. I nominal Rating: 20 kA and compliance to all UL96A requirements for ac surge protection.

I. Repetitive Surge: SPD shall survive a minimum of 14,000 repetitive category C3(20kV/10kVA) surges with no more than 10% deterioration. Calculated repetitive surge values will not be accepted. SPD manufacturer shall provide repetitive surge test report.

J. Temporary Over Voltages: SPD shall be able to prevent common temporary over voltage from damaging the MOVs, increasing longevity and ability of SPD unit to protect the critical load. SPD shall limit the voltage per the following chart.

Overvoltage seen by MOVs as % of Nominal				
	available current			
time	30A	100A	500A	1000A
1 cycle	120%	130%	150%	160%
10 cycles	130%	150%	160%	160%
30 cycles	140%	150%	160%	160%

K. Temporary Over Voltage: SPD shall be able to withstand a minimum of 100 temporary over voltage events, as defined by: 30A available fault current, 30 cycles of duration, with 10 seconds between events.

2.3 PANEL SUPPRESSORS (Type B and A)

A. Basis of Design: Subject to compliance with requirements. Provide comparable product by the following:
1. Current Technology "TG3".
2. ASCO 570 SERIES
3. Approved equivalent provided all specification requirements met within. Submission package must be received by engineer two weeks prior to bid date shall fully comply with all performance characteristics included in this specification.

B. SPDs: Listed as Type 1 SPD per UL1449 4th Edition
1. Include LED indicator lights for power and protection status.
2. Internal thermal protection that disconnects the SPD before damaging internal suppressor components.
3. Include Form-C contacts rated at 2 to 5A and 24-V ac to 250-V ac, one normally open and one normally closed, for remote monitoring of protection status.

C. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per mode shall not be less than 100kA (Type B), 200kA per Phase and 50kA (Type C) 100kA per Phase. The peak surge current rating shall NOT be the arithmetic sum of the ratings of the individual MOVs in a given mode. SPD manufacturer shall provide independent 3rd party testing validating unit is capable of surviving a single surge at the specified rating.

D. Comply with UL 1283 with a maximum attenuation of 34dB based on 50ohm insertion loss test per MIL-STD-220B

E. Protection modes and UL 1449 VPR for grounded wye circuits with 480Y/277V or 208Y/120V, three-phase, four-wire circuits shall not exceed the following:
1. Line to Neutral: [1200 V for 480Y/277 V] [700 V for 208Y/120 V].
2. Line to Ground: [1200 V for 480Y/277 V] [700 V for 208Y/120 V].
3. Neutral to Ground: [1000 V for 480Y/277 V] [700 V for 208Y/120 V].
4. Line to Line: [2000 V for 480Y/277 V] [1200 V for 208Y/120 V]

F. Protection modes and UL 1449 VPR for 240/120-V, single-phase, three-wire circuits shall not exceed the following:
1. Line to Neutral: 700 V.
2. Line to Ground: 700 V.

3. Neutral to Ground: 700 V.
4. Line to Line: 1200 V.

G. SCCR: Equal or exceed 200 kA.

H. Inominal Rating: 20 kA

2.4 ENCLOSURES

A. Indoor Enclosures: NEMA 250, Type 1.

B. Outdoor Enclosures: NEMA 250, Type 3R.

2.5 CONDUCTORS AND CABLES

A. Power Wiring: SPD SHALL be equipped with mechanical lugs that can accept up to #2 AWG wire. Where conductors between SPD and switchgear exceed 10’ in total length, they shall be “High Performance Interconnect” (HPI) cables with Ultra Low impedance characteristics at 10kHz and above.

B. Class 2 Control Cables: Multi-conductor cable with copper conductors not smaller than No. 18 AWG, complying with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

C. Class 1 Control Cables: Multi-conductor cable with copper conductors not smaller than No. 14 AWG, complying with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1.

B. Install an OCPD or disconnect as required to comply with the UL listing of the SPD.

C. Install SPDs with conductors between suppressor and points of attachment as short and straight as possible and adjust circuit-breaker positions to achieve shortest and straightest leads. Do not splice and extend SPD leads unless specifically permitted by manufacturer. Do not exceed manufacturer's recommended lead length. Do not bond neutral and ground. If installed lead length exceeds 10’, SPD manufacturer shall provide a low impedance cable that improves the installed performance.

D. Use crimped connectors and splices only. Wire nuts are unacceptable.

E. Wiring:
1. Power Wiring: Comply with wiring methods in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

2. Controls: Comply with wiring methods in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.2 FIELD QUALITY CONTROL

A. Contractor shall perform the following tests and inspections with the assistance of a factory-authorized service representative.
   1. Compare equipment nameplate data for compliance with Drawings and Specifications.
   2. Inspect anchorage, alignment, grounding, and clearances.
   3. Verify that electrical wiring installation complies with manufacturer's written installation requirements.

B. An SPD will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.3 SYSTEM TESTING

A. Upon completion of installation, provide the start-up and testing services of a factory-authorized and factory-trained local service representative. The tests shall include:
   1. Off-line Testing: Impulse injection to verify the system tolerances as well as verification of proper facility neutral-to-ground bond. Compare field test results to factory benchmark test parameters supplied with each individual unit.
   2. On-line Testing: Verify that suppression and filtering paths are operating with 100% protection as well as verification of proper facility neutral-to-ground bond by measuring neutral-to-ground current and voltage and by visual inspection.
   3. Voltage measurements from Line-to-Ground (L-G), Line-to-Neutral (L-N), Line-to-Line (L-L), and Neutral-to-Ground (N-G), taken at the time of the testing procedure.

3.4 DOCUMENTATION AND REPORTING

A. Record results of field testing and compare to factory benchmark test parameters supplied with each individual surge protective device. Indicate that the integrity of neutral-to-ground bonds were verified through testing and visual inspection, and that grounding bonds were observed to be in place.

B. Submit to the Owner’s representative and to the Architect/Engineer copies of the startup test results and the factory benchmark testing results for confirmation of proper suppression filter system function, as required by this section. Provide the number of copies as required by Division One and the Electrical General Provisions section; and three copies where not otherwise specified.

END OF SECTION

SECTION 26 50 00

LIGHTING

PART 1 GENERAL

1.1 LIGHTING SCHEDULE

A. The Contractor shall install lighting fixtures and accessories as shown on the drawings and/or described herein. The Contractor shall also install lamps for all fixtures.

1.2 SUBMITTALS & PRIOR APPROVAL

A. Prior approvals and/or submittals shall submit the following:
   1. Cutsheets clearly indicating fixture options selected.
   2. Photometric calculations of the floor plan including point by point calculations and a calculation schedule which shall include the following foot-candle measurements for each room and site plan.
      a. Maximum value
      b. Minimum value
      c. Max/Min Ratio
      d. Average

PART 2 PRODUCTS

2.1 LED LIGHTING

A. Lighting fixtures with LED light sources shall meet the following fixture and light source requirements:
   1. LED Color Temperature – Per Drawings
   2. CRI > 80
   3. Line Voltage – Universal Voltage 120-277 volts
   4. Governmental Standards – LM79 and LM80 Compliant
   5. Expected Lamp Life – LED Life Rating (L_{70} B_{10}) to be 60,000 hours to 100,000 hours; Defined as time of operation (in hours) to 30% lumen depreciation (i.e. 70% lumen maintenance), derived from Luminaire in-situ temperature measurement testing (i.e. LED chip package temperature (T_S) measurement obtained with the LED chip package operating in given luminaire and in a given stabilized ambient environment) under UL1598 environments and directly correlated to LED package manufacturers IESNA LM-80-08 data. Predicted (L_{70} B_{10}) Limits (@ 25°C luminaire ambient operating environment): Greater than 60,000 hours @ 350mA Drive Current
   6. Driver – Components must be fully encased in potting material for moisture resistance, and must comply with IEC and FCC standards
   7. Surge Protection – Surge protection must be provided including separate sure protection built into electronic driver
   8. Mechanical – Luminaire LED system components to be low copper aluminum, with high performance heat sink(s) designed specifically for LED luminaires. No active cooling

features (Fans, etc.). Luminaire configuration must allow for modular upgradability and/or field repair of all electrical components (i.e. LED modules, Driver(s), etc.). Drivers and vertical light bars must be all mounted to a twist-lock tool-less assembly for ease of installation and trouble- shooting.

2.2 LIGHTING ACCESSORIES

A. All lighting shall be equipped with the appropriate housing for the ceiling type shown on the architectural reflected ceiling plan.
   1. GYP Ceilings –
      a. 1'x4' 2'x2' & 2'x4' Troffers: Provide flange kit or surface mount kit. If not explicitly indicated on plan contractor shall price based on the more costly product and submit an RFI to Engineer prior to purchase.
      b. Downlights: Provide recessed housing and appropriate flange kit.
      c. Strip lighting: Provide surface mount kit. In areas with ceiling heights greater than 10' contractor shall provide chain suspension hardware.
      d. Architectural linear fixtures: Where indicated as recessed contractor shall provide flange kit or mud-in kit as required. If not explicitly indicated on plan contractor shall price based on the more costly product and submit an RFI to Engineer prior to purchase.
   2. Grid Ceilings – Provide appropriate mounting hardware to recess fixtures into grid.

B. Fire ratings: Lighting in fire rated ceiling shall be equipped with fire padding, caulking, and/or housings as required to maintain fire ratings. Contractor shall refer to architectural plans for all fire ratings prior to bid.

C. Emergency battery backup and inverters:
   1. Where remote battery backup is utilize contractor shall coordinate all remote test switch locations with owner/architect prior to rough in. They shall not be located in ceiling adjacent to fixture.

2.3 OCCUPANCY SENSORS

A. Sensor shall be a self-contained dual voltage ceiling mounted device capable of directly switching loads upon detection of human activity. Sensor must be circular, and mount to either a single gang enclosure, or surface mount to a round pancake box.

B. Sensor must be rated for 120 through 277 VAC and be capable of switching zero to 1200 watts of electronic ballast loads. Sensors must be capable of parallel wiring for multi-sensor applications.

C. Sensor time delay shall be factory set for typical applications, and field adjustable from 30 seconds to 20 minutes. Sensor must provide a green LED motion indicator. Red LED denoting life safety shall not be permitted.

D. PIR sensing must utilize a high density Fresnel domed lens, providing a circular view pattern of at least 360 degrees by 56 degrees.

E. Passive Dual Technology (PDT) sensing must incorporate PIR with Microphonics, which utilizes a passive microphone with automatic gain control (AGC) to sense both occupants moving and sounds. The PIR must be used to initiate an on condition, once on the PIR or Microphonics shall keep the load on. After the time delay expires and the load goes off, the Microphonics shall remain active up to 10 seconds as a back-up grace period.

F. Wall box mounted occupancy sensors shall mount in a standard utility box. Sensor shall have self-contained relay (no power pack required), utilize PIR and microphonics detection, and include auto sensitivity adjustment. Wall box sensor shall be intrinsically grounded and include ON/OFF switch and adjustable time delay.

G. Occupancy Sensor:
1. Ceiling mount for offices and restrooms – Lutron #LOS-CUS-1000-WH / PP-DV; Wattstopper UT-305-2/BZ-50; Sensor Switch CM PDT9
2. Wall mount for offices, storage rooms, etc. – Lutron #MS+OPS6M-DV-color; Wattstopper WD-170-FINISH; Sensor Switch WSX
3. Ceiling mount in large rooms – Lutron #LOS-CDT-2000WH, with #PP-DV universal power pack; Wattstopper DT-205 / BZ-50; Sensor Switch CM PDT10 with PP16
4. Wall/ceiling mount at end of corridors – Lutron #LOS-WIR-WH / PP-DV 1600'ft coverage; Wattstopper CX-105 / BZ-50; Sensor Switch WV16 with PP16
5. Wall/ceiling mount at center of corridors – Watt Stopper #CX-100-3 series, with #BZ-50 universal power pack; Sensor Switch WV16 with PP16
6. Room controllers – Wattstopper #LMRC-101; nLight #nPP 16

2.3 FIXTURES

A. Fixtures as described in the Fixture Schedule on the drawings shall be furnished by the Contractor and shall be properly installed.

B. Where fixtures are specified with emergency remote test switches contractor shall coordinate location of remote test switch with Owner/Architect prior to installation.

C. Warramty shall be 5 year minimum.

PART 3 EXECUTION

3.1 INSTALLATION

A. Unless otherwise specified, lighting fixtures shall be permanently installed and connected to the wiring system.

B. The Contractor shall support each fixture, independently from the building structure. Ceiling framing members shall not be used to support fixtures except in specified areas where ceiling supports for this purpose have been specified elsewhere in these specifications. Each fixture shall have at least two fixture supports.

C. Flexible conduit used for fixture whips shall be at least twelve (12) inches, but not more than

48 inches long.

D. Site lighting poles shall include a foundation with a minimum depth below grade of 8'. Those located within parking areas shall extend from grade 3' in pedestrian areas a reduction in foundation height is permitted, refer to foundation drawings for specific pedestrian area requirements.

3.2 CEILING COMPATIBILITY

A. Catalog numbers shown on the drawings or descriptions of lighting fixtures contained herein may indicate fixture compatibility with certain types of ceiling construction. Contractor shall determine exact type of ceiling actually to be furnished in each area and shall obtain fixtures to suit, deviation from specified catalogue numbers or descriptions only where necessary and only to the extent necessary to insure fixture/ceiling compatibility.

3.3 LIGHT LEAKS

A. The Contractor shall, at the end of this project, adjust all recessed lighting fixtures so that there will be no light leaks between the fixture trim and the ceiling. Contractor shall also adjust recessed fluorescent fixtures to eliminate any light leaks between fixture trim and ceiling grid member.

3.4 LAMPS

A. The Contractor shall install lamps in all fixtures and shall obtain replacement lamps should any not properly operate or become damaged during construction.

3.5 EXIT FIXTURES

A. Exit fixtures shall be installed according to Life Safety Code requirements, with face(s) plainly visible and directional arrows indicating the proper direction of egress.

END OF SECTION

DIVISION 27

COMMUNICATIONS

SECTION 27 00 00

STRUCTURED CABLING SYSTEM

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 PURPOSE

A. This document defines the products and the execution requirements required to furnish and install a complete distribution system utilizing a structured cabling system.

B. All cables and related terminations, support and grounding hardware shall be furnished, installed, tested, and documented by the structured cabling contractor as detailed in this document.

C. The distribution system shall be all inclusive and represent a complete installation at the sites shown on the attached drawings and in the attached specifications. The Vendor shall be responsible for all parts, labor, and all other associated apparatus necessary to completely install, test and turnover for acceptance to the Customer the cabling system detailed herein.

D. Product specifications and general design considerations are provided in this document. Quantities of telecommunication outlets, typical installation details, cable routing and outlet types will be provided as an attachment to this document. The successful vendor shall meet or exceed all requirements for the cable system described in this document.

E. Refer to contract drawings for additional requirements to include color coding of faceplates, jacks and cables, labeling, installation, etc.

1.3 RELATED REQUIREMENTS

A. Drawings and general provision of Contract, including General and Supplementary Conditions, Division 1 Specification, and Electrical sections apply to work in this section.

B. Install raceways for auxiliary systems.

C. Interior conduit EMT, minimum 1” unless noted otherwise.

D. Conduit to extend from wall and floor outlets to above accessible ceiling and terminate with a bushing.

E. All conduits indicated as spare shall have nylon pullcord.

1.4 REFERENCE STANDARDS

A. ANSI/TIA/EIA-568B.1-Commercial building Telecommunications Cabling Standard, Part 1: General Requirements

B .ANSI/TIA/EIA-568-B.2-Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components.

C. ANSI/TIA/EIA-568-B.3- Optical Fiber Cabling Components Standard.

D. ANSI/TIA/EIA-569B-Commercial Building Standard for Telecommunications Pathways and spaces.

E. ANSI/TIA/EIA-606(A)-The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.

F. ANSI-J-STD-607(A)- Commercial Building Grounding and Bonding Requirements for Telecommunications.

G. TIA-526-7-OFSTP-7 Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant.

H. TIA-526-14A-OFSTP-14 Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant.

I. ANSI/TIA/EIA-758(A)- Customer-Owned Outside Plant Telecommunications Cabling Standard.

J. TIA TSB-140 Additional Guidelines for Field Testing Length, Loss and Polarity of Optical

K. ANSI/TIA/EIA 568 B-2.10- 10GIG ETHERNET

L. Install Cabling in accordance with the most recent edition of BICSI publications.
1. BICSI-Telecommunications Distribution Methods Manual.
2. BICSI-Installation Transport Systems information Manual.
3. BICSI-Network Design Reference Design Manual.
4. BICSI-Outside Plant Design Reference Manual.

M. Federal, State and local codes, rules, regulations, and ordinances governing the work, are fully part of the specifications as if herein repeated or hereto attached.

N. If the contractor should note items in the drawings or the specifications, construction of which would be a code violation, promptly call them to the attention of the owner's representative in writing.

O. Where the requirements of other sections of the specifications are more stringent than applicable codes, rules, regulations, and ordinances, the specifications shall apply.

P. All material shall be listed by UL or other National Independent testing standard shall apply.

Q. If this document and any of the documents listed above are in conflict, then the more stringent requirement shall apply. All construction documents listed are believed to be the most current. The Vendor has the responsibility to determine and adhere to the most recent release when developing the proposal for installation.

R. This document does not replace any code, either partially or wholly. The Contractor must be aware of local codes that may impact this project.

1.5 APPROVED CONTRACTOR

A. The Contractor shall have total responsibility for the coordination and installation of the work shown and described in the Drawings and Specifications. The Contractor shall be a company specializing in the design, fabrication and installation of integrated telecommunication systems.

B. The installation of all cable, equipment, terminations, & associated services shall be performed by a company that is a Manufacture's Certified Structured Cabling System Installer in good standing with a minimum of three (3) years of experience on similar systems.

C. A copy of certification documents must be submitted with the product submittals for quote to be valid. The telecommunications contractor is responsible for workmanship and installation practices in accordance with the manufacturer's written policies.

D. The cable or connectivity manufacturer will extend a 25-year manufacturer's warranty for all products installed in this project to the end user once the telecommunications contractor fulfills all requirements under these specifications.

E. The contractor must have an office with qualified service and installation personnel within 100 miles of the project site.

F. The Telecommunications cabling contractor must provide a reference list with contact names and phone numbers for three (3) projects of similar scope.

G. The contractor shall employ a full-time RCDD to perform the role of Project Manager. RCDD shall be available for consultation and to attend project meetings. The contractor shall not subcontract a third party RCDD.

H. A BICSI certified installer shall be employed by the contractor and be on site as the installation manager.

I. The owner reserves the right to require the Vendor to remove from the project any such employee the Owner deems to be incompetent, careless or insubordinate.

J. All clean up activity related to work performed, will be the responsibility of the Contractor and must be completed daily before leaving he site.

1.6 COORDINATION WITH OTHER TRADES

A. The Contractor shall coordinate telecommunications work with that of other Sections as required ensuring that the entire telecommunications work will be carried out in an orderly, complete and coordinated fashion.

1.7 SUBMITTALS

A. Submit to the engineer/designer shop drawings, product data (including cut sheets and catalog information), and samples required by the contract documents. Submit shop drawings, product data, and samples with such promptness and in such sequence as to cause no delay in the work or in the activities of other contractors. The engineer/designer will indicate approval of shop drawings, product data, and samples submitted to the engineer by stamping submittals "APPROVED" with a stamp. Submitted shop drawings shall be initialed or signed by the contractor's legitimate firm name.

1. By submitting shop drawings, product data, and samples, the Vendor represents that he/she carefully reviewed and verified materials, quantities, field measurements, and field construction criteria related thereto. It also represents that the Vendor has checked, coordinated, and verified that information contained within shop drawings, product data, and samples conform to the requirements of the work and of the contract documents.
2. The engineer's/designer's approval of shop drawings, product data, and samples submitted by the Vendor shall not relieve the Vendor of responsibility for deviations from requirements of the contract documents, unless the Vendor has specifically informed the engineer/designer in writing of such deviation at time of submittal, and the engineer/designer has given written approval of the specific deviation. The vendor shall continue to be responsible for deviations from requirements of the contract documents not specifically noted by the Vendor in writing, and specifically approved by the engineer in writing.
3. The engineer's/designer's approval of shop drawings, product data, and samples shall not relieve the Vendor of responsibility for errors or omissions in such shop drawings, product data, and samples.
4. Storage and handling requirements and recommendations.
5. Installation method.

B. Shop Drawings: Show compliance with requirements on isometric schematic diagram of network layout, showing cable routings, telecommunication closets, rack and enclosure layouts and locations, service entrance, and grounding, prepared and approved by BICSI Registered Communications Distribution Designer (RCDD).

C. Submit proof from manufacturer that the contractor is in good standing with the manufacturer’s warranty program.

D. Submit letter from manufacturer stating that the manufacturer will provide twenty-five (25) year warranty in accordance with the requirements stated in this document.

E. Submit copy of RCDD certification.

F. Upon request by the engineer/designer, furnish a list of references with specific information

regarding type of project and involvement in providing of equipment and systems.

G. Submit references as required.

H., At completion of project, Contractor shall submit the following:
1. Horizontal certification test results printed and saved to USB drive.
2. Backbone certification test results printed and saved to USB drive.
3. Project Record Documents: Prepared and approved by BICSI Registered Communications Distribution Designer (RCDD). The record documents shall be bound and consist of the following:
   a. Product cut sheets for all products supplied.
   b. Test reports for horizontal cabling.
   c. Test reports for backbone cabling.
   d. Manufactures warranties.
   e. "D-Size" As built drawings.

I. As built drawings should accurately record location of service entrance conduit, termination backboards, outlets boxes, cable raceways, cable trays, pull boxes, and equipment racks electronically using AutoCAD 2000 or later version and on minimum "D" size reproducible paper prints.

J. The contractor shall prepare an 18" x 24" as-built serving zone drawing for each Telecommunication Room. The drawing shall be laminated, framed and secured to the wall in the Telecom Room.

K. Work shall not proceed without the Engineer's approval of the submitted items. The Contractor shall receive approval from the Engineer on all substitutions of material. No substituted materials shall be installed except by written approval from the engineer.

1.8 QUALITY ASSURANCE

A. Equipment and materials required for installation under these Specifications shall be the current model and new (less than one (1) year from the date of manufacture), unused and without blemish or defect.

B. Equipment and materials of the type for which are independent standard testing requirements, listings, and labels, shall be listed and labeled by the independent testing laboratory.

C. Material and equipment shall be new, and conform to grade, quality, and standards specified. Equipment and materials of the same type shall be a product of the same manufacturer throughout installation.

D. Product Requirements:
1. The product shall be manufactured by an ISO 9001-2000 Certified Facility.
2. Product shall be free from defects in material and workmanship.
3. The manufacturer must have a field representative who holds an RCDD who will perform quality control inspections monthly, during the life of the project.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Products must be stored according to manufacturers' recommendations.

B. Keep stored products clean and dry.

C. If the Telecommunications Contractor wishes to have a trailer on site for storage of materials, arrangements shall be made with the owner.

1.10 DRAWINGS

A. It shall be understood that the electrical details and drawings provided with the specification package are diagrammatic. They are included to show the intent of the specifications and to aid the Telecommunications Contractor in bidding for the job. The Telecommunications Contractor shall make allowance in bid proposal to cover whatever work is required to comply with the intent of the plans and specifications.

B. The Telecommunications Contractor shall verify all dimensions at the site and be responsible for their accuracy.

C. Prior to submitting the bid, the telecommunications Contractor shall call the attention of the Engineer to any materials or apparatus the Telecommunication Contractor believes to be inadequate and to any necessary items of work omitted.

1.11 WARRANTY

A. See Section "Closeout Submittals" for additional warranty requirements.

B. The Contractor shall provide a manufactures warranty to guarantee end-to-end high performance cabling systems that meet application requirements. The guarantee shall include all Horizontal drops and Backbone fiber optic cable and connectivity components and have one point of contact for all cabling system issues. The system shall be warranted for a period of 25 years.

C. Materials and workmanship hereinafter specified shall be fully guaranteed by the vendor for a (1) one year period after Date of Substantial Completion against any defects. Defects which may occur as the result of faulty materials or workmanship within one year after installation and acceptance by The Customer shall be corrected by the Vendor at no additional cost to the Customer. The Vendor shall promptly, at no cost to The Customer, correct re-perform (including modifications or additions as necessary) any nonconforming or defective work within one year after completion of the project of which the work is part.

1.12 SEPARATION FROM EMI SOURCES

A. Comply with BICSI TDMM and ANSI/TIA/EIA-569-B recommendations for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.

B. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
   1. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
   2. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
   3. Electrical Equipment Rating More than 5 kVA: A minimum of 12 inches.

C. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows.
   1. Electrical Equipment Rating Less than 2 kVA: A minimum of 2 ½ inches.
   2. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
   3. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.

D. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
   1. Electrical Equipment Rating Less than 2 kVA: No requirement.
   2. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
   3. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.

E. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.

F. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 12 inches.

PART 2 PRODUCTS

2.1 EQUIVALENT PRODUCTS

A. Due to the nature and type of communications all products, including but not limited to racks, patch panels, jacks, faceplates, patch cords, J-hooks shall be manufactured by Hubbell, Siemon, or Panduit.

B. Provide products of manufacturers as named in individual articles.

C. Where no manufacturer is specified, provide products of manufacturers in compliance with requirements.

D. Where equipment is identified by manufacturer and catalog number, it shall be a base of requirements for quality and performance. Where manufacturers for equipment are identified by name, the Contractor may submit for approval, similar equipment of other manufactures as substitution. The Engineer’s decision as to whether the submitted equipment is acceptable shall be final and binding.

E. The request for substitutions must be received (10) ten days prior to bid opening by Engineer in writing, listing all physical and technical differences between product specified and product request for substitution. Product samples of each item must accompany written request.

F. Accepted substitutions will be approved by means of addendum.

2.2 CATEGORY 6 HORIZONTAL DISTRIBUTION CABLE

A. All Horizontal station cables shall terminate on modular patch panels in their respective Telecommunication Room or Equipment Room as specified on the drawings.

B. All cable, workstation jack modules and patch panel jack modules shall be the same color as designated on prints. If colors are not designated Coordinate color with Engineer. See details.

C. Unshielded Twisted-Pair Cabling:
1. Cable construction shall be 23 AWG with four twisted pairs of insulated solid bare annealed copper conductors with separator.
2. Outer jacket shall meet NEC requirements and have a Nominal Cable diameter not to exceed .200 for CMP (in)
3. Cable shall have a minimum bend radius of 1.0 (in).
4. Contain “Crossweb” Filler
5. Must have positive PSACR beyond 250 MHz.
6. Application assurance warranty.
7. All transmission performance parameters shall be independently verified by UL or ETL third party testing organization.
8. Contractor will use a plenum rated cable jacket unless being installed in slab and below grade.
9. Approved Manufacturer - Category 6 Horizontal Cable:
10. Jacket Color: Purple – Data

Manufacturer	CMR	CMP
Hubbell	HC6RRx	HC6RPx

D. ANY CABLE LOCATED IN SLAB BELOW GRADE SHALL BE RATED FOR WET LOCATIONS.
1. Approved Manufacturer - Indoor/Outdoor Rated Cable:

Manufacturer	CMP
Hubbell	C6IOSPBK

2.3 CATEGORY 6A HORIZONTAL DISTRIBUTION CABLE

A. All Horizontal WAP Cable shall terminate on modular patch panels in their respective Telecommunication Room or Equipment Room as specified on the drawings.

B. All cable and patch panel jack modules shall be the same color as designated on prints. If colors are not designated Coordinate color with Engineer. See details.

C. Unshielded Twisted-Pair Cabling:
1. Cable construction shall be 23 AWG with four twisted pairs of insulated solid bare

annealed copper conductors with separator.

2. Outer jacket shall meet NEC requirements and have a reduced diameter not to exceed .265 for CMP (in)
3. Cable shall have a minimum bend radius of 1.0 (in).
4. Contain “Crossweb” filler.
5. +7dB of Headroom Above Standards to suppress Alien Crosstalk
6. High Power PoE (4PPoE) Read
7. All transmission performance parameters shall be independently verified by UL or ETL third party testing organization.
8. Approved Manufacturer - Category 6A Horizontal Cable:

Manufacturer	CMR	CMP
Hubbell	C6ASRDSY	C6ASPDSY

2.4 WORK AREA OUTLETS

A. WAO shall consist of a single gang 2 Port or 4 Port thermoplastic or stainless face plate.

B. Finish: White or 430 stainless steel with stainless steel mounting screws

B. Work area outlets shall each be terminated at their designated work area location in the connector types described below.

C. The same orientation and positioning of jacks and connectors shall be utilized throughout the installation. Prior to installation, the Telecommunications Contractor shall submit the proposed configuration for each outlet assembly, with labeling, for review by the owner.

D. The wiring scheme for this project shall be T568B unless otherwise directed by the owner.

E. Category 6 Modular Jack:

2. Third Party Verified Category 6 Component
3. Cobra-Lock Termination Technology
4. Wires Secured Under Constant Compression
5. Easily Re-Terminate
6. 25 IDC Re-termination Cycles
7. Qualified to 150% of 802.3bt PoE Current Level
8. Where color is not indicated coordinate with Engineer prior to installation.
9. Approved Manufacturer - Category 6 Modular Jack (WAO):

Manufacturer	Modular Jack
Hubbell	HJU6xx

F. Jacks at WAO and patch panels shall be color-coded with appropriate colored jacks or icons as follows:

1. Two port face plates:
   a. The left jack shall be BLUE, and the right jack RED. Contractor shall be responsible for making sure the color at the patch panel coordinates with jack at WAO.

2. Four port face plates:
   a. The upper left jack shall be BLUE, the upper right. jack shall be RED, the bottom-left jack shall be GREEN, and the bottom right jack shall be GRAY.

2.5 WIRELESS ACCESS POINT OUTLET

A. WAP outlets shall consist of a minimum of two (2) Category 6 cables be terminated above ceiling using a Cat6 Yellow jack in a 2-port Surface Box or using a Cat6 MPTL assembly. Either option shall leave a 10-foot service loop on the horizontal cable run.

B. Each WAP location shall be identified with a 1"x 2" black phenolic tag with white lettering affixed to the underside of the ceiling grid. It shall be the contractor's responsibility to verify measurements of the ceiling grid prior to ordering the phenolic tags, so as not to create an overhang by the label.

C. Each cable shall be identified with a printed wire wrap label.

D. The wiring pattern for this project shall be T568B unless otherwise directed by the owner.

E. The wiring pattern of jacks and connectors shall be utilized throughout the installation. Prior to installation, the Telecommunications Contractor shall submit the proposed configuration for each outlet assembly, with labeling, for review by the owner.

F. Category 6 Modular Jack:
1. Third Party Verified Category 6 Component
2. Cobra-Lock Termination Technology
3. Wires Secured Under Constant Compression
4. Easily Re-Terminate
5. 25 IDC Re-termination Cycles
6. Qualified to 150% of 802.3bt PoE Current Level
7. Where jack color is not indicated coordinate with Engineer prior to installation.
   a. Approved Manufacturer - Category 6A Modular Jack Assembly (WAP):

Manufacturer	Jack	Surface Box
Hubbell	HJU6AY (Purple Jacks)	HSB2W(P)

b. Approved Manufacturer - Category 6A Modular Plug (WAP):

Manufacturer	Modular Plug
Hubbell	SCP6A

2.6 COPPER PATCH CABLES

A. Patch Cables shall be factory terminated with modular plugs featuring a tangle-free latch design and clear strain-relief boots to support easy moves, adds and changes. Each patch cord shall be 100% performance tested at the factory to the TIA/EIA Category 6 standard. *Each patch cord shall be made by the same factory as the Cat6 jacks and patch panels used in the project*.

B. Contractor shall provide one 5ft patch cable for each cable terminated at patch panel. Contractor shall provide one patch cable for each terminated WAO, with half the WAO patch cables being 10ft and remaining half being 15ft. Provide an additional 5% surplus equally divided between 5ft, 10ft & 15ft. Confirm lengths and color with owner prior to ordering and transmittal.

C. Approved Manufacturer - Patch Cable: (Work with owner on quantities and colors)

Manufacturer	5ft Cat6	10ft Cat6	15ft Cat6
Hubbell	HCL6x05	HCL6x10	HCL6x15

2.7 MODULAR PATCH PANELS

A. All horizontal voice, data and wireless, CCTV & AV cables shall be installed in a modular rack mount patch panel. Each patch panel shall have strain relief bars for each row of 24 ports (a 48-port panel gets 2 relief bars).

B. Approved Manufacturer - Patch Panel:

Manufacturer	24 Port	48 Port	Strain Relief
Hubbell	HPJ24	HPJ48	CMBR

2.8 HIGH IMPACT THERMOPLASTIC FACEPLATES WITH LABEL FIELDS

A. Verify color of faceplate with architect and engineer prior to ordering.

B. Approved Manufacturer -Faceplate:

Manufacturer	1-Port	2-Port	4-Port
Hubbell	IFP11W	IFP12W	IFP14W

2.9 BACKBONE FIBER OPTIC CABLE

A. Furnish and install a minimum of one (1) 12 strand fiber optic cable from the MDF to each IDF, unless otherwise indicated on backbone Riser diagram.

B. All indoor fiber optic cable shall be tight buffered construction with Interlocked Armored Plenum rated.

C. All outdoor or underground fiber optic cables shall be an indoor/outdoor jacket with tight buffered construction.

D. Approved Manufacturer - Indoor Interlocking Armored Fiber Optic Cable:

Manufacturer	Singlemode (OS2)	Multimode (OM4)
Corning	048ZU4-T4F22D20	

E. Approved Manufacturer - Indoor/Outdoor Fiber Optic Cable:

Manufacturer	Singlemode (OS2)	Multimode (OM4)
Corning	048ZU4-T4F22D20	

2.10 FIBER OPTIC RACK MOUNT ENCLOSURE

A. Enclosure shall be mounted in standard 19" rack or cabinet. Shall have front and rear access on all modules via molded-hinged doors. Must have radius control and cable management for fiber patch cords. Shall have multiple cable entry locations. Include fiber optic cable routing kit (grommets, cable ties, saddle clips, strain relief bracket and ID/caution labels for various cable management solutions.

B. Approved Manufacturer - Rack Mount Fiber Optic Enclosure:

Manufacturer	1U	4U
Corning	EDGE-01U	EDGE-04U

2.11 FIBER OPTIC ADAPTER PANELS

A. All adapter panels shall be LC form factor and use zirconia ceramic split sleeves. Use blank adapters in each empty port in each fiber optic enclosure.

B. Fill unused slots of fiber enclosure with blank panels

B. Approved Manufacturer - LC Adapter Panel:

Manufacturer	LC 12-Port OS2
Corning	EDGE-CS12-AE-P00RE

2.12 FIBER OPTIC CONNECTORS

A. Fiber connectors shall have a LC UPC interface. Connectors may be a mechanical or splice-on type connector.

B. Approved Manufacturer - Fiber Optic Connectors:

Manufacturer	LC; OS2 Mechanical
Corning	LC

2.13 FIBER OPTIC PATCH CABLES

A. Contractor shall provide six (6) duplex fiber patch cords for each 12 strands of fiber installed. Patch cables shall be capable of connecting from fiber patch panel to owner provided

equipment.

B. Fiber patch cables shall be manufactured in the USA.

C. Approved Manufacturer - Fiber Patch Cables Products: (Work with owner on quantities)

Manufacturer	OS2; LC/LC; 1M; YL; Plenum	OM4; LC/LC; 1M; AQ; Plenum
Hubbell	DFHPCLCLCS1SM	DFHPCLCLCF1MM

2.14 Network/EQUIPMENT CABINETS

A. Secure cabinet per manufactures instructions and install 18" Ladder Rack from top of each rack to wall.

B. Each ladder rack shall utilize a "waterfall" or cable drop out at each 2-post rack to maintain the bend radius to each vertical cable manager.

C. Ground each cabinet per ANSI/TIA/EIA-607 Requirements.

D. Maintain 36" clearance from the front and rear of cabinet and on one side.

E. Where no dedicated MDF/IDF closet is available or space will not allow for the use of a floor mounted cabinet use a Wall Mount Swing Gate Style Cabinet

F. Where space is extremely narrow use Hubbell REBOX Part Number: RE4XB or equivalent.

G. Reference riser diagram to determine Cabinet type.
1. Approved Manufacturer - Cabinets:
a. Floor Cabinet

Manufacturer	45RU Floor Cabinet
APC	AR3140

2.15 EQUIPMENT RACKS

A. Secure each 2-post relay rack to floor per manufactures instructions and install 18" Ladder Rack from top of each rack to wall.

B. Each ladder rack shall utilize a "waterfall" or cable drop out at each 2-post rack to maintain the bend radius to each vertical cable manager.

C. Ground each rack per ANSI/TIA/EIA-607 Requirements.

D. Maintain 36" clearance from the front and rear of rack and on one side.

E. If more than one rack is installed, install all racks in a straight line, side by side with vertical wire management between each rack (see section 2.26.B).

F. Where no dedicated MDF/IDF closet is available or space will not allow for the use of a floor mounted rack use a Wall Mounted Cabinet.

2.16 CABLE MANAGEMENT

A. Vertical Cable management shall be provided on each side and between each set of racks.

B. Install 6” vertical cable management at the end of each rack row and 10” vertical cable management between each rack.

C. Reference drawings for further detail:

D. Approved Manufacturer – Vertical Cable Manager:

Manufacturer	45RU; 6 in; Vert Cable Mgr
Chatsworth	13912-703

E. Approved Manufacturer – Horizontal Cable Manager:

Manufacturer	Horz. Cable Mgr
Hubbell	HM277C

2.17 LADDER TRAY FOR TELECOMMUNICATION ROOMS

A. All ladder tray shall be 18" in width and have 1 1/2" x 3/8" stringers, unless instructed otherwise per drawings,

B. Ladder tray shall be made of tubular steel; and the finish shall be black powder coat.

C. Furnish and install 18" ladder tray from each floor mount rack/server cabinet to wall. Furnish and install 18" ladder tray around wall as required to support cables. (A minimum of (2) walls shall be completely covered by ladder tray).

D. Furnish and install cable retaining post on each side of tray every 4ft as required to support cables.

E. A "waterfall" or cable drop out shall be utilized for each transition from ladder tray to vertical cable manager. A proper bend radius shall be maintained at all times.

F. All raw ladder tray ends shall be covered with a protective cap to match the color of the ladder tray itself.

G. Provide necessary accessories from original ladder rack manufacturer for a complete solution.

H. Approved Manufacturer – Ladder Tray:

Manufacturer	12 in Ladder Tray	18 in Ladder Tray
Chatsworth	10250-712	10250-718

2.18 RACK MOUNT PDU

A. Contractor shall provide and install (1) 30A/208V metered/switched vertical PDU in each cabinet or 4 post rack specified on project, and (1) 30 amp basic rack mount horizontal PDU in each floor mount 2 Post rack.

B. Approved Manufacturer – Power Distribution:

Manufacturer	Horizontal PDU
APC	AP7800B

2.19 COPPER BACKBONE CABLING

A. Furnish, install and terminate a minimum Cat3 100pr 24awg solid copper cable from the MDF to each IDF unless indicated otherwise on the Riser Diagram.

B. All indoor conductors are to be terminated on 100pr wall mount 110 terminal block kits. Each 100pr 110 block shall be terminated with C5 blocks.

C. Where cable routes above ceiling provide a plenum rated cable. Where cable routes underground provide an outdoor PE-89 type cable with building entrance protector at each end.

D. Jacket Color: Grey

E. Approved Manufacturers – 100 Pair Cable:

Manufacturer	Indoor 100Pr Plenum	Outdoor 100Pr PE-89
Essex	18-799-36	09-104-92
Prysmian	2131758	7525819

F. Approved Manufacturers - 110 Block Kits:

Manufacturer	100pr 110 Terminal Block Kit with C5 blocks
Hubbell	18-799-36

G. The building entrance protector shall be a 100 pair 110 in/110out with cover and splice chamber. Unit shall be 16awg powder coated and allow up to 22awg line termination. Unit shall be stackable for future expansion and equipped with internal fuse link and accommodate industry standard 5-pin protection modules. The unit shall be UL497 approved. Contractor shall fully populate each 5-Pin protector port with the specified protector module.

1. Approved Manufacturers – Building Entrance Protectors:

Manufacturer	100pr Building Entrance Protector	5-pin protection modules

CircaMax	1880ECA1-100	3B1E
Tii Technologies Inc.	24100-110-M110C	75-3C1EW-N

2.20 CATV HORIZONTAL CABLES

A. Coax Cable shall be Series 6 quad shield plenum rated.
1. Approved Manufacturers – Series 6 Cable:

Manufacturer	Series 6 Quad Shield; Plenum
Essex	78-14C-91
Prysmian	2131758

B. Coax Terminations & Connectors :
1. All coax shall be terminated with compression style connectors. All corresponding strippers and crimp tools shall be used for complete and proper termination.
2. Approved Manufacturers – Series 6 Connectors:

Manufacturer	Series 6 Compression Connectors
Hubbell	FRG625

2.21 GROUNDING AND BONDING

A. Grounding shall conform to ANSI-J-STD607(A)- Commercial building Grounding and bonding Requirements for Telecommunications, National Electrical Code, ANSI/NECA/BICSI-568 and manufacture's grounding requirements as minimum.

B. Bond and ground equipment racks, housings, messenger cables, and raceways.

C. Connect cabinets, racks, and frames to single-point ground which is connected to building ground system via (minimum #6) green insulated copper grounding conductor.

D. Contractor shall verify actual measurement of the Telecommunication Bonding Backbone (TBB) and size the bonding backbone accordingly.

E. Approved Products:

Manufacturer	Primary Bonding Busbar (PBB)	Secondary Bonding Busbar (SBB)	Compression Lug; 2-Hole	Ladder Tray Bonding Jumper Kit
Hubbell	HBBB14416H	HBBB14212	HGBLxxxx	HGRKTKA9KA5
Burndy	BBB14416H	BBB14212N	BGBLxxxx	BGRKTKA9KA5

F. Contractor to provide all additional necessary components, including but not limited to C-Taps, H-Taps, RB, RBC, TEBC

2.22 J-HOOKS

A. The cable support used must maintain complete horizontal and vertical 1" bend radius control.

B. Do not exceed EIA/TIA standards or manufactures recommendations of 40% fill ratio in each cable support.

C. All J-Hooks are to be placed no more than 4-5 feet apart.

D. Approved Products:
   1. Hubbell
   2. Caddy
   3. B-Line

2.23 FIRE STOP

A. Sealing penetrations of fire rated walls and floors is necessary to ensure compliance with building code requirements as well as to protect life and property, and it is a practice that we take seriously and require.

B. Penetrations through fire-rated assemblies made during the installation and any holes created by the removal of existing penetrants shall be sealed to the original rating of the fire-rated architectural structures and assemblies using manufacturer approved methods in accordance with local code requirements.

C. The term fire stop refers to the installation of “qualified/listed” fire stop materials in holes made through fire-rated floors, walls, or ceilings for the penetration of pipes, cables, or other construction/building, service/utility items.

D. Fire stop products are used to restore the opening to the original fire-rated integrity. Most common requirements are for 1, 2, or 3 hours. In rare instances, a 4-6 hour rating shall be provided.

E. We require installers to use one of the U.L. Classified Systems listed, unless otherwise approved by North Oak Hospital.

F. Do not combine different manufactures products, UL test systems not components. Failure to use a system solution will lead to non acceptance by North Oak Hospital. The contractor will need to fix these penetrations at no expense to the end user.

2.24 ACCEPTABLE SYSTEMS

A. Fire-stop Putty
   1. This product is generally used to seal small to medium sized cable bundles.
   2. The Putty is a non-hardening compound that has no shrinkage that may be hand packed into openings.
   3. For steel sleeves up to 4-in. diameter that are already installed, install Putty to the required depth as specified in the listed and labeled system.

B. Fire-stop Pillows

1. Pillows are generally used in medium to large sized openings and excel in applications around cable trays.
2. These products resemble small cushions. They are comprised of resilient mineral fiber blocks encapsulated on all six sides with a fast acting intumescent (expansion mechanism used to seal off penetrants that can burn and melt) sealed in a non-toxic polyethylene bag.
3. The slip finish of the poly bag makes installation fast and the product is perfect for MACs because a single pillow can easily be removed to facilitate the cabling change and the same pillow can be quickly replaced.
4. Where cable trays penetrate a rated wall or floor, use Firestop Pillows as per the applicable listed and labeled system.

C. Other types will be accepted but must be approved prior to use by the ENGINEER and North Oak Hospital.

PART 3 EXECUTION

3.1 PRE-INSTALLATION SITE SURVEY

A. Prior to start of system, meet at the project site with owner's representative and representatives of trades performing related work to coordinate efforts. Review areas of potential interference and resolve conflicts before proceeding with the work. Facilitation with the General Contractor will be necessary to plan the crucial schedule completions of the equipment room and telecommunication closet.

B. Examine areas and conditions under which the system is to be installed. Do not proceed with work until satisfactory conditions have been achieved.

3.2 INSTALLATION GUIDELINES

A. The work included under this specification, consist of furnishing all labor, equipment, material, and supplies and performing all operations necessary to complete the installation of this structured cabling system in compliance with the specifications and drawings. The Telecommunications contractor will provide and install all of the required material to form a complete system whether specifically addressed in the technical specification or not.

B. All work performed on this project will be installed in accordance with the current edition of the National Electrical code, the current edition of The National Electrical Safety Code, the current issue of the National Electrical Code, The current edition of ANSI/NECA/BICSI-568-Standard for Installing Commercial Building Telecommunications Cabling, the current edition of the BICSI Telecommunications Distribution Methods Manual, the current edition of the BICSI Cabling Installation Manual, the latest issue of ANSI/TIA/EIA Standards as published Global Engineering Documents as ANSI/TIA/EIA Telecommunications Building Wiring Standards, and all local codes and ordinances. Should conflicts exist with the foregoing, the authority having jurisdiction for enforcement will have responsibility for making interpretation.

C. If this document and any other documents listed above are in conflict, then the more stringent

requirements shall apply. All documents listed are believed to be the most current release of the documents. The Vendor has the responsibility to determine and adhere to the most current release.

D. This document does not replace any code, either partially or wholly. The Vendor must be aware of local codes that may impact this project. All, local, State and federal codes are to be followed.

E. All materials shall be UL Listed or listed by other National Independent testing agency and shall be marked as such.

F. Section Includes: Equipment, materials, labor, and services to provide a complete structured cabling system including, but not limited to:
1. Furnish and install a complete telecommunication wiring infrastructure.
2. Furnish, install, terminate and test all copper and Optical fiber cables.
3. Furnish and install Raceway, boxes, and cable tray.
4. Furnish and install all wall plates, jacks, patch panels, and patch cords as described.
5. Furnish and install all required cabinets and/or racks as required and as indicated.
6. Furnish any other material required to form a complete system.
7. Perform Link testing (100% of horizontal and/or backbone links) and certification of all components. All test must meet or exceed link testing requirements as specified in this document.
8. Furnish test results of all cabling to the owner on disk and paper format, listed by each closet, then by workstation ID.
9. Provide owner test results and documentation. (Testing documentation and as-built drawings).
10. Removal of abandoned cable, if required.

3.3 WORK NOT INCLUDED

A. Unless otherwise indicated, the Vendor is not responsible for providing data concentrators, hubs, switches, servers, computers, and other active devices such as PBX's.

3.4 INSTALLATION

A. Install materials and equipment in accordance with applicable standards, codes, requirements, and recommendations of national, state, and local authorities having jurisdiction, and current National Electrical Code and with manufacturer's instructions.

B. Install in accordance with manufacturer's instructions.

C. All cable shall conform to the requirements for communications circuits defined by the National Electrical code (Article 800). Cable listed to NEC Article 800-51(a) will be used for "Plenum" installations. Cable listed to NEC Article 800-51(b) shall be installed in vertical runs penetrating more than one floor.

D. Adhere to manufacturer’s specifications for pulling tension, minimum bend radii, and sidewall pressure when installing cables.

1. Where manufacturer does not provide bending radii information, minimum-bending radius shall be 15 times cable diameter. Arrange and mount equipment and materials in a manner acceptable to the engineer and the owner.

E. Penetrations through floor and fire-rated walls shall utilize intermediate metallic conduit (IMC) or galvanized rigid conduit (GRC) sleeves and shall be fire stopped after installation and testing, utilizing a fire stopping assembly for that application. Contractor may also utilize EZ Path fire rated pathway or equivalent.

F. Install station cabling to the nearest telecommunications room (TR), unless otherwise noted.

G. Installation shall conform to the following basic guidelines.
Use of approved wire, cable, and wiring devices.
Neat and uncluttered wire termination.

H. Where cable tray is not used, attach cables to permanent structure with suitable attachments at intervals of 48 to 60 inches. Support cables above removable ceilings.

I. Follow manufactures recommendations on spacing and number and type of cables installed in j-hooks or cable tray to avoid cable stress.

J. Separation and physical barriers between communication cabling and power cables must be always maintained.

K. Install adequate support structure for 10-foot service slack at each TR.

L. Support riser cables every (3) floors and at top of run with cable grips.

M. Limit number of four-pair data riser cables per grip to fifty (50).

N. Install cables in one continuous piece. Splices or taps will not be allowed.

O. Provide overvoltage protection on both ends of cabling exposed to lightning or accidental contact with power conductors.

3.5 LABELING

A. Label each outlet with permanent self-adhesive label.

B. Label each cable within 1" of termination on each end.

C. Use labels on the face of patch panels. Provide facility assignment records in a protective cover at each telecommunications closet location that is specific to the facilities therein.

D. Use color-coded labels for each termination field that conforms to ansi/TIA/EIA-606(A) standard color codes for termination blocks.

E. Labels shall be machine-printed. Handwritten labels shall not be acceptable.

F. Mark up floor plans showing outlet locations, type, and cable marking of cables. Turn these drawings over to the owner two (2) weeks prior to move in date.

G. Three (3) sets of as-built drawings shall be delivered to the owner within four (4) weeks of acceptance of project by the owner. A set of as-built drawings shall be provided to the owner in electronic form utilizing CAD software that is acceptable to the owner. The electronic media shall be delivered to the owner within six (6) weeks of acceptance of project by owner.

3.6 TESTING

A. Testing shall conform to ANSI/TIA/EIA-568-B.1 standard. Testing shall be accomplished using a level IIe or higher field testers.

B. All testing shall meet or exceed Manufactures recommendation for 25-year warranty program,

C. Test each pair and shield of each cable for open shorts, grounds, and pair reversal. Correct grounded and reversed pairs.

D. If copper backbone cable contains more than one (1) percent bad pairs, remove and replace entire cable.

E. If horizontal cable contains bad conductors or shield, contractor shall remove and replace cable at no additional cost to owner.

F. Test optical cable with a light source and power meter utilizing procedures as stated in ANSI/TIA/EIA-526-14a: OFSTP-14A Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant and ANSI/TIA/EIA-526-7 Measurements of Optical Power Loss of Installed Singlemode Fiber Cable Plant. Measure results shall be plus/minus 1 dB of submitted loss budget calculations. Correct improper splices and replace damaged cables at no charge to the owner.
   1. Cables shall be tested at 850 and 1300 nm for multimode optical fiber cables. Cables shall be tested at 1310 and 1550 for singlemode optical fiber.
   2. Testing procedures shall utilize "Method B"- one jumper reference.
   3. Bi-directional testing of optical fiber is required.
   4. Submit printout for each cable tested. The use of handwritten test results will not be acceptable.

3.7 FIELD QUALITY CONTROL

A. Employ job superintendent or project manager during the course of the installation to provide coordination of work of this specification and of other trades and provide technical information when requested by other trades. This person shall maintain current RCDD (Registered Communication Designer) registration and shall be responsible for quality control during installation, equipment set-up, and testing.

B. Installation personnel shall meet manufacturer's training and education requirements for implementation of extended warranty program.

END OF SECTION

DIVISION 28

ELECTRONIC SAFETY AND SECURITY

SECTION 28 31 00

FIRE DETECTION AND ALARM

PART 1 GENERAL

1.1 INCLUDED IN THIS SPECIFICATION

A. Provide a complete fire alarm system per this project's plans and specifications. The system shall include a state-of-the-art, software-based control panel using addressable and analog type initiating.

B. These specifications and the accompanying Drawings define the intent of the fire alarm system to be provided. In addition to the system as specified herein and shown on the Drawings, the Contractor shall provide all planning, design, calculations, equipment, devices, raceways, boxes, cabling, system programming and any other component or service required for a complete, fully operational and code compliant system.

1.2 REFERENCES

A. Electrical Industries Association (EIA):
1. RS-232-D – Interface Between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange
2. RS-485 – Electrical Characteristics of Generators and Receivers for Use in Balanced Multipoint Systems

B. National Fire Protection Association (NFPA):
1. NFPA 12 – Standard on Carbon Dioxide Extinguishing Systems.
2. NFPA 13 – Installation of Sprinkler Systems.
3. NFPA 15 – Standard for Water Spray Fixed Systems for Fire Protection.
4. NFPA 16 – Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems.
5. NFPA 16A – Standard for the Installation of Closed Head Foam-Water Sprinkler Systems.
6. NFPA 70 – National Electrical Code (NEC).
7. NFPA 72 – National Fire Alarm Code 2010 Edition
8. NFPA 90A – Standard for the Installation of Air Conditioning and Ventilating Systems.
9. NFPA 101 – Life Safety Code 2012 Edition
10. NFPA 750 – Standard on Water Mist Fire Protection Systems.
11. NFPA 5000 – Building Construction and Safety Code.
12. IBC Chapters 9 & 10 2012 Edition
13. ADAAG Americans with Disabilities Act Application Guidelines

C. Fire Alarm Control Panel Equipment: System shall comply with applicable provisions of the following UL standards and classifications:
1. UL 864 9th Edition
2. UOJZ, Control Units, System.

3. SYZV Control Units, Releasing Device.
4. UOXX, Control Unit Accessories, System.

D. The Fire Alarm Control Panel's U.L. Listed signaling types shall be:
1. Digital alarm communicator
2. Other Technology

1.3 SUBMITTALS

A. Equipment Submittal Brochures:
1. Provide minimum 10 copies of submittal brochures and shop drawings.
2. Submittal brochures shall be bound my means of 3 ring binders, binding combs or similar. Stapled brochures will be rejected.
3. Provide one submittal brochure in color, highlighted and reserved for use by the Louisiana State Fire Marshal Plan Review Office. This copy shall become the record copy for the project.
4. Include a cover page that indicates the following minimal information:
   a. Project name and address.
   b. Engineered systems distributor's name and contact information.
   c. Installing contractor's name and contact information.
   d. The date of the equipment submittals and date of any subsequent required re-submittals. Indicate on revised submittals the original submittal date and re-submittal date.
   e. Architectural project review number assigned by the Louisiana State Fire Marshal's Office.
5. Provide a Scope of Work Narrative describing the system's basic operating premise in written word.
6. Provide a detailed Sequence of Operation Matrix Grid tailored for this project indicating the cause and effect of all fire alarm system control panels, input and output functions.
7. Include a system bill of material prepared specifically for this project. Include the make, model, description, quantity and manufacturer for every component to be installed in the project.
8. Provide manufacturer's data sheet for each component to be installed in the project. For data sheets that include multiple part numbers, options and accessories, the components included or pertinent to this project shall be highlighted in yellow.
9. Include the U.L. (Underwriters Laboratories) Certification for each component to be installed in the system. The U.L. Certification shall be placed directly behind its corresponding data sheet.
10. Manufacturers device compatibility documentation shall be included proving testing and operational compatibility between control panels and peripheral devices.
11. Separate battery calculations shall be provided for each control panel and prepared on manufacturer's official worksheets.

B. Shop Drawings
1. Shop drawings shall be prepared with the contractor's own title block which shall include:
   a. Project name and address.

b. Contractor's name, address and phone number.
c. Date.
d. Drawing pages shall be numbered.
e. Bound with spines and stapled.
f. Floor plan scale.
g. Louisiana State Fire Marshal architectural assigned project number.
h. Revision number with re-submittal dates.

2. Drawings shall contain one floor per page. If a floor must be split use match lines and references that refer sheet number to match lines.
3. Floor plan shop drawings shall be prepared in AutoCAD.
4. Prepare floor plans to a 1/8" = 1'-0" scale unless directed otherwise by the architect.
5. Show all equipment, control panels, and device locations.
6. Include a distinct address for every device including panels, initiating, notification, auxiliary, and peripheral devices. All visual notification appliances shall have their candela indicated.
7. Floor plans shall include the following:
   a. Door swings.
   b. Room names and numbers.
   c. Reflected ceiling plan overlay.
   d. Ceiling heights.
   e. Fire and smoke barriers.
   f. Office furnishings when available.
8. Include a symbol schedule of devices for this project.
9. Include the necessary details and general notes for mounting heights, device placement restrictions, etc.
10. End-of-line symbols shall be shown on the floor plans.
11. Riser locations shall be indicated on the floor plan by a bold circle.
12. A detailed riser shall be provided as part of the shop drawings. The riser shall include:
    a. Control panels, power supplies, annunciators, demark cabinets, each identified with its own address and description matching the symbol schedule.
    b. Operating power requirements with breaker panel and breaker number identification.
    c. All system circuits including initiating, notification, SLC, power, control, monitor, network, audio, riser, fiber optic, phone, category cable and auxiliary circuits. Circuits shall be individually addressed indicating wire type, size, quantity and color.
    d. Provide a point to point diagram of every system device on its riser circuit using the exact device symbol as the floor plan. Provide the corresponding device address and candela rating next to each device.
    e. Provide the cumulative current draw at the end of each notification appliance circuit.
    f. Indicate location and placement of surge suppressors.
    g. Provide detail circuit diagrams for connections with systems from other trades.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, number and manufacturer.

B. Store materials in clean, dry area indoors in accordance with manufacturer's instructions.

C. Protect materials from damage during handling and installation.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Personnel shall be trained and certified by manufacturer for installation of units required for this Project and shall be supervised by a Nicet Level III Supervisor.
   2. Manufacturer's product shall have been in satisfactory operation on three installations of similar size, type and design as this project, for approximately 3 years.
   3. The installing contractor shall have been actively engaged in the business of designing, selling, installing, and servicing fire alarm systems for at least ten (10) years.
   4. The installing contractor shall provide 24-hour, 365 days per year emergency service with factory trained, state licensed service technicians.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Source Limitations: Fire-Alarm System and Components: Obtain fire-alarm system from single source from single manufacturer.

1.6 MAINTENANCE AGREEMENT

A. Contractor shall warranty material and installation against defects in manufacturing and workmanship for a period of one year beginning on the date of final acceptance of the project. Warranty related service calls shall be provided at no charge during the contractor's normal working hours.

B. Initial Maintenance Service: Beginning at Substantial Completion, provide full inspection and maintenance by skilled employees of manufacturer's designated service organization during the Warranty period, including any special warranty period specified.
   1. Include inspection, maintenance, testing, and repair contract in compliance with the manufacturer's recommended routine preventive maintenance program and NFPA 72 requirements necessary to maintain full ongoing listing on the complete installed system.
   2. Provide parts and supplies same as those used in the manufacture and installation of the original equipment.
   3. The contractor performing the contract services shall be qualified and listed to maintain ongoing certification and listing of the completed system.

C. Extended Maintenance Service: Offer for the Owner's consideration and evaluation at the time of Product Data Submittal, a priced inspection, maintenance, testing, and repair contract in compliance with the manufacturer's recommended routine preventive maintenance program and NFPA 72 requirements necessary to maintain full ongoing listing on the complete installed system.
   1. The services offered under this contract shall begin after the completion of the Initial Maintenance Service and Warranty Period.
   2. The Owner shall have the option of renewing for single or multiple years, up to five years, at the price quoted upon completion of the Warranty period.
   3. The contractor performing the contract services shall be qualified and listed to maintain ongoing certification and listing of the completed system.

1.7 COORDINATION

A. Coordinate installation and operational requirements for automatic elevator recall, including but not limited to the recall signal time frame, with Division 14 and with authorities having jurisdiction.

B. Coordinate installation and operational requirements for fire-protection systems, including but not limited to water-based sprinkler system, pre-action system and clean agent extinguishing system, with Division 21.

C. Coordinate installation and operational requirements for smoke control systems with Division 23.

D. Coordinate installation and operational requirements for kitchen fire-suppression systems with hood manufacturer, fire-suppression system manufacturer and with Division 23.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. The following are acceptable manufacturers and series for control panels. No substitutions are allowed.
   1. Siemens Cerberus PRO Compact

      Contact: Priority Systems
      Todd Neal
      504-887-8887

2.2 FIRE ALARM SYSTEM OPERATIONAL DESCIRIPTION

A. The fire alarm system shall be fully addressable with notification and initiation devices as shown on drawings. Additional components shall be provided as required for a complete, functional, and code compliant system.

B. Alarm Signals:

1. Fire Alarm signal initiation shall be by one or more of the following devices and/or systems:
    a. Manual Pull Stations
    b. Heat Detectors
    c. Smoke Detectors
    d. Heat detectors in elevator shaft and pit.
    e. Automatic sprinkler system water flow
    f. Fire-extinguishing system operation including but not limited to fire suppression for kitchen, dry-pipe sprinkler system and pre-action sprinkler systems.
2. Supervisory signal initiation shall be by one or more of the following devices and/or actions:
    a. Duct-Mounted smoke detectors.
    b. Valve supervisory switch. (Operation of a fire-protection system valve tamper switch.)
    c. Low-air-pressure switch of a dry-pipe sprinkler system.
    d. Low-air-pressure switch of a pre-action sprinkler system.
    e. Fire-pump running.
    f. Fire-pump power failure, including a dead-phase or phase-reversal condition.
    g. Elevator shunt-trip supervision.
3. System trouble signal initiation shall be by one or more of the following devices and/or actions:
    a. Open circuits, shorts, and grounds in designated circuits.
    b. Opening, tampering with, or removing alarm-initiating and supervisory signal initiating devices.
    c. Loss of primary power at fire-alarm control unit.
    d. Ground or a single break in fire-alarm control unit internal circuits.
    e. Abnormal ac voltage at fire-alarm control unit.
    f. Break in standby battery circuitry.
    g. Failure of battery charging.
    h. Abnormal position of any switch at fire-alarm control unit or annunciator.

C. Specialized Alarm Actions:
1. Elevator Recall: Activate elevator recall system to start in accordance with ANSI Standard A17.1 and NFPA 72. Comply with the following:
    a. Initiate Elevator Recall Sequence to return elevators to their primary or alternate recall floors upon receipt of a General Alarm by the Fire Alarm Control Panel (FACP).
    b. Smoke detectors designated for Elevator Recall shall be connected to fire-alarm system. Initiate a General Alarm upon detection of smoke.
    c. Actuation of the elevator lobby detector located on the designated primary recall floor shall signal the cars to move to the alternate recall floor.
2. Elevator Shunt-Trip Operation: Heat detectors designated for elevator power removal shall be connected to fire-alarm system. Alarm-initiating devices, except those listed, shall not start elevator power removal.
    a. Actuation of heat detectors in the locations indicated below shall shut down power, via a shunt trip operator, to the elevators associated with the location

without time delay:

1) Heat detector in elevator machine room; locate detector within two feet of each sprinkler head.
2) Heat detectors in elevator hoistway; locate detector within two feet of each sprinkler head.

3. Air-Handling System Shut-Down: Upon receipt of a General Alarm by the Fire Alarm Control Unit perform the following, unless otherwise indicated in sequence for smoke control system or sequence for smoke venting system in a windowless anesthetizing locations:
   a. Operate control relay contacts to signal shutdown of the Air-Handling system(s) serving the evacuation signaling zone where the alarm signal originated. Signal shall remain on until alarm conditions are cleared and fire-alarm system is reset. Signal shall not stop in response to alarm acknowledge or signal silence commands. Coordinate and interface with Division 23.
   b. Shut the smoke or combination fire/smoke dampers at that specific air-handling units' supply and return connections.
   c. Shut all smoke and combination fire/smoke dampers associated with the air handling system.
   d. Provide for an adjustable time delay, initially set at 20 seconds, to delay the transmission of close signals to the dampers. The intent of this time delay is to allow the air-handling unit fan(s) to receive the stop signal and slow down before closing any dampers in order to avoid a high static-pressure alarm/trip on the air-handling system.
4. Duct-mounted smoke detector: Duct-mounted smoke detector shall initiate the following functions, unless otherwise indicated in sequence for smoke control system or sequence for smoke venting system in a windowless anesthetizing locations:
   a. Initiate a Supervisory Alarm.
   b. Shutdown the associated air-handling unit.
   c. Shut the smoke or combination fire/smoke dampers associated with that specific smoke detector and shut the smoke or combination fire/smoke dampers at the associated air-handling unit.
   d. Provide for an adjustable time delay, initially set at 20 seconds, to delay the transmission of close signal to the dampers. The intent of this time delay is to allow the air-handling unit fan(s) to receive the stop signal and slow down before closing any dampers in order to avoid a high static-pressure alarm/trip on the air-handling system.
5. Kitchen Fire-Suppression: An alarm signal from the kitchen fire-suppression system shall initiate the following functions prior to discharge of fire extinguishing agent:
   a. Initiate General Alarm when the kitchen fire-suppression system is activated.
   b. Operate control relay contacts to remove power from equipment located equipment under kitchen hood. Relay control shall open circuit breaker via use of breaker-mounted shunt trip operator(s).
   c. Operate control relay contacts to close solenoid valve(s) to shut-off fuel supply to kitchen equipment under kitchen hood.
   d. Operate control relay contacts to initiate the smoke evacuation system.

Coordinate and interface with Division 23.

2.8 SUPPLEMENTARY NOTIFICATION APPLIANCE POWER SUPPLIES

A. The following are acceptable manufacturers and series for supplementary notification appliance circuit power supplies. No substitutions are allowed. It is the intent of this specification that all notification equipment must be available over the counter through security equipment distributor network markets
   1. APS6 of APS10 with the appropriate amp.

B. The supplementary NAC power supply shall offer up to 6.0 amps continuous regulated 24-volt power. The power supply shall include the following features:
   1. Integral Charger: Charge up to 35.0 amp-hour batteries and support 60-hour standby.
   2. 2 Input Triggers. Input trigger shall be Notification Appliance Circuit (from fire alarm control panel) or supervised addressable relay.
   3. Surface-mount back box.
   4. Ability to delay AC fail delay in accordance with applicable NFPA requirements.
   5. Power limited circuitry in accordance with applicable UL standards.
   6. Operates as sync follower or a sync generator.
   7. Shall have on-board built in sync capability for System Sensor and Wheelock brand appliances.

C. Do not exceed 75% of the power supply's available listed current. Provide the necessary quantity of power supplies to satisfy this requirement with the quantity of devices indicated on the plans.

2.10 SYSTEM PERIPHERALS

A. Every device's address shall be set by means of a rotary-decimal switch using a standard screwdriver. Devices using or requiring binary switches, handheld device programmers or addressed only through software mapping shall not be acceptable.

B. Smoke detectors
   1. General Description:
      a. UL 268 listed, operating at 24-V dc, nominal.
      b. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP.
      c. Integral Visual-Indicating Light: LED type. Indicating detector has operated and power-on status.
   2. Photoelectric Smoke Detectors:
      a. Sensor: LED or infrared light source with matching silicon-cell receiver.
      b. Detector Sensitivity: Between 2.5 and 3.5 percent/foot (0.008 and 0.011 percent/mm) smoke obscuration when tested according to UL 268A.
   3. Duct Detectors
      a. Duct detectors shall be System Sensor DNR or DNRW Series housings.
      b. Housings and all the related accessories listed below shall be provided for the each of the following:

1) On the ductwork of every supply branch of every HVAC air handling/rooftop unit exceeding 2,000 CFM
2) On the ductwork of every return branch of HVAC air handling/rooftop unit exceeding 2,000 CFM. Where duct detectors cannot be practically or effectively installed on return ductwork, securely fasten the duct detector on the side of the AHU and install and secure its sampling tube across the front of the return air filter.
3) On every shown smoke and fire/smoke damper. Where duct detectors cannot be practically installed on dampers consult with the general contractor to coordinate their installation with other trades.

c. The housing shall include the listed addressable photoelectric smoke detector head which shall twist in and lock inside the housing.

d. Provide System Sensor DST Series sampling tube of enough length to extend 75% of the width of the duct it is being installed in. Sampling tubes in ducts exceeding widths of 6 feet shall exceed and install across the entire width of the duct and be supported by drilling a hole in the opposite side of the ductwork.

e. A System Sensor model RTS151KEY module shall be installed for each duct detector. Provide phenolic labels identifying the related HVAC unit it is connected to. The RTS151KEY module shall mount in a standard single gang electrical box. Verify and coordinate location of RTS151KEY modules with architect.

f. Provide one addressable relay module for each HVAC required function including:
1) AHU Shutdown
2) Smoke damper operation
3) Smoke sequence/exhaust/pressurization operations

g. System designs incorporating hardwired, conventional relays for any mechanical functions are not allowed and will be subsequently rejected.

C. Pull Stations
1. Shall be fully listed and compatible with the furnished system, dual action, and constructed of Lexan with clearly visible operating instructions provided on cover. The word FIRE shall appear on front of stations in raised letters.
2. Stations shall be designed so after actuation they cannot be restored except by key reset.
3. Stations shall be keyed alike with the fire alarm control panel and NAC power supply.
4. Surface boxes shall be available as an option from the manufacturer.
5. Pull stations shall not utilize glass rods.

D. Thermal Detectors
1. Shall be listed and compatible with the furnished system.
2. Detector shall be rated at 135 degrees and shall have rate of rise element rated at 15 degrees per minute.
3. UL521 listed

E. Beam-Type Smoke Detector: Each detector shall consist of a separate transmitter and

receiver, and shall have the following features:

1. UL 268 listed, operating at 24-V dc, nominal.
2. Adjustable Sensitivity: At least six sensitivity levels, settable at the receiver, measured as percent of obscuration.
3. Two selectable alarm delay settings, allowing each to be associated with a corresponding sensitivity.
4. Separate Color-Coded LEDs: Indicate normal, alarm, and trouble status with remote indicator panels.

F. Addressable Monitor Modules

1. Where required provide addressable monitor modules to monitor normally open dry contacts from other non-addressable equipment.
2. Module shall be suitable for installation on a standard 4" square electrical box 2-1/8" deep and shall include the manufacturer's matching cover plate.
3. An LED shall be visible on the outside of the module's cover plate and shall flash under normal conditions and remain on steady when it's connected device is in alarm.
4. Modules not suitable for mounting directly onto a 4" square electrical box or those which wire with pigtail type connectors are not acceptable.

G. Supervised Addressable Output Module

1. Provide addressable supervised output module where required for the project to provide a supervised, programmed 24volt DC reverse polarity output.
2. Module shall be suitable for installation on a standard 4" square electrical box 2-1/8" deep and shall include the manufacturer's matching cover plate.
3. An LED shall be visible on the outside of the module's cover plate and shall flash under normal conditions and remain on steady when the module is activated.

H. Addressable Relay Output Module

1. Provide addressable modules suitable for installation on a standard 4" square electrical box 2-1/8" deep and shall include the manufacturer's matching cover plate.
2. The module shall provide two isolated sets of Form-C normally open and normally closed contacts
3. Contact ratings shall be rated at minimum 2.0 amps resistive or 1.0 amp inductive
4. An LED shall be visible on the outside of the module's cover plate and shall flash under normal conditions and remain on steady when the module is activated.

I. Audio Visual Notification Appliances

1. Shall be System Sensor SpectrAlert Advance Series listed for use on both wall and ceiling as indicated on the plans.
2. Provide devices white in color with red FIRE screened on device from manufacturer.
3. Audio visual devices shall be one complete assembly utilizing a speaker for audible notification for this project.
4. The device shall be suitable for mounting on standard electrical boxes using the manufacturer's universal mounting plate. The strobe device shall snap into the mounting plate and secured by one fastener.
5. The manufacturer's mounting plate shall include screw terminals to accept all field

wiring.

6. Candelas shall be selectable in settings of 15, 15/75, 30, 75, 95, 110, 115, 135, 150, 177 and 185.
7. The strobe shall be listed to U.L. 1971 standards and meet all current ADAAG Guidelines.
8. The horn shall be listed to U.L. 464 approved for fire protective service and shall have three audibility options and an output to switch between a temporal three pattern and a non-temporal continuous pattern.
9. Provide manufacturer's surface mount and weatherproof backboxes where required.

J. MAGNETIC DOOR HOLDERS

1. Description: Units are equipped for wall or floor mounting as indicated and are complete with matching doorplate.
   a. Electromagnet: Requires no more than 3 W to develop 25-lbf (111-N) holding force.
   b. Wall-Mounted Units: Flush mounted unless otherwise indicated.
   c. Rating: 24-V ac or dc.

2. Material and Finish: Match door hardware.

2.11 WIRE AND CABLE

A. The following are acceptable manufacturers:
   1. Windy City Wire
   2. General Cable

B. Cable shall be approved for plenum use without conduit per the NFPA 262 Flame Test

C. Cable shall be approved per NEC 800, 760; UL, CMP, FPLP UL, RoHS Complaint

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and surfaces to receive fire alarm system.
   1. Notify Architect of conditions that would adversely affect installation or subsequent use.
   2. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

A. Install fire alarm system in accordance with NFPA 72, NFPA 70, state and local codes, manufacturer's instructions, and as indicated on the Drawings.

B. Conceal conduit, junction boxes, and conduit supports and hangers in finished areas. Conceal or expose conduit, junction boxes, and conduit supports and hangers in unfinished areas.

C. Do not install smoke detectors before system programming and test period. If construction is ongoing during this period, take measures to protect smoke detectors from contamination and physical damage.

D. Flush-mount fire detection and alarm system devices, control panels, and remote annunciators in finished areas. Flush-mount or surface-mount fire detection and alarm system devices, control panels, and remote annunciators in unfinished areas.

E. Ensure manual stations are suitable for surface mounting or semi-flush mounting as indicated on the Drawings. Install not less than 42 inches, not more than 48 inches, above finished floor measured to operating handle.

F. Duct-Mounted Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct.

G. Heat Detectors in Elevator Shafts: Coordinate temperature rating, thermal response characteristic and location with sprinkler rating and location.

H. Remote Status and Alarm Indicators: Install near each smoke detector and each sprinkler water-flow switch and valve-tamper switch that is not readily visible from normal viewing position.

I. Smoke- or Heat-Detector Spacing:
1. Comply with NFPA 72, "Smoke-Sensing Fire Detectors" Section in the "Initiating Devices" Chapter, for smoke-detector spacing
2. Comply with NFPA 72, "Heat-Sensing Fire Detectors" Section in the "Initiating Devices" Chapter, for heat-detector spacing.
3. Smooth ceiling spacing shall not exceed the listing of the detector.
4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Appendix A in NFPA 72.
5. HVAC: Locate detectors not closer than 5 feet (1.5 m) from air-supply diffuser or 3 feet(1 m) from return-air opening.
6. Lighting Fixtures: Locate centerline of detectors not closer than 12 inches (300 mm) from any part of a lighting fixture.

3.3 FIELD QUALITY CONTROL

A. Manufacturer’s Field Services: Provide service of competent, factory-trained technician authorized by manufacturer to technically supervise and participate during pre-testing and acceptance testing of system.

B. Testing:
1. Conduct complete visual inspection of control panel connections and test wiring for short circuits, ground faults, continuity, and insulation before energizing cables and wires.
2. Close each sprinkler system control valve and verify proper supervisory alarm at Control Panel.
3. Verify activation of flow switches.

4. Open initiating device circuits and verify that trouble signal actuates.
5. Open signaling line circuits and verify that trouble signal actuates.
6. Open and short notification appliance circuits and verify that trouble signal actuates.
7. Ground initiating device circuits and verify response of trouble signals.
8. Ground signaling line circuits and verify response of trouble signals.
9. Ground notification appliance circuits and verify response of trouble signals.
10. Check installation, supervision, and operation of intelligent smoke detectors.
11. Introduce on system each of the alarm conditions that system is required to detect. Verify proper receipt and proper processing of signal at Control Panel and correct activation of control points.
12. Consult manufacturer's manual to determine proper testing procedures when system is equipped with optional features. This is intended to address such items as verifying controls performed by individually addressed or grouped devices, sensitivity monitoring, verification functionality, and similar.

C. Acceptance Testing:
1. Before installation shall be considered completed and acceptable by AHJ, a complete test using as a minimum, the following scenarios shall be performed and witnessed by representative approved by Engineer. Monitoring company and/or fire department shall be notified before final test in accordance with local requirements.
2. Contractor's job foreman, in presence of representative of manufacturer, representative of Owner, and fire department shall operate every installed device to verify proper operation and correct annunciation at control panel.
3. Open signaling line circuits and notification appliance circuits in at least 2 locations to verify presence of supervision.
4. When testing has been completed to satisfaction of both Contractor's job foreman and representatives of manufacturer and Owner, a notarized letter co-signed by each attesting to satisfactory completion of said testing shall be forwarded to Owner and fire department.
5. Leave fire alarm system in proper working order and, without additional expense to Owner, replace defective materials and equipment provided within 1 year (365 days) from date of final acceptance by the owner.

3.4 DEMONSTRATION

A. Provide instruction as required for operating fire alarm system.

END OF SECTION

DIVISION 31

EARTHWORK

SECTION 31 10 00
SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Protection of existing trees, vegetation, and site features designated to remain.
2. Removal of trees, shrubs, and other vegetation not designated to remain.
3. Clearing and grubbing within the limits of construction shown on the drawings.
4. Demolition and removal of existing structures, foundations, and below-grade obstructions within the work limits, as shown on the drawings.
5. Removal of existing pavement, curbing, and aggregate base within the limits of new construction.
6. Removal and capping or relocation of existing utilities encountered within the clearing limits, in coordination with all specifications and the utility owner.
7. Topsoil stripping, stockpiling, and protection for reuse.
8. Disposal of cleared and demolished materials off-site.

B. Payment: Clearing, grubbing, and stripping of trees, brush, weeds, and other vegetation within the limits of construction is incidental to the Contract and is not subject to separate or direct payment, unless a separate pay item for this work is identified in the bid form.

C. Related Requirements:

1. Section 31 20 00 – Earth Moving.

1.2 REFERENCES

A. ANSI A300 (Part 1) – Tree, Shrub, and Other Woody Plant Management – Pruning.

B. ANSI Z133.1 – Arboricultural Operations – Safety Requirements.

C. Louisiana Department of Environmental Quality – applicable solid waste disposal and erosion control requirements.

D. Tangipahoa Parish Government tree protection and right-of-way ordinances, as applicable.

1.3 DEFINITIONS

A. Clearing: Removal of trees, shrubs, brush, vegetation, downed timber, and rubbish from the site.

B. Grubbing: Removal of stumps, roots larger than 1½ inches in diameter, and matted roots from the site.

C. Topsoil: Friable surface soil found in a depth of not less than 4 inches; reasonably free of subsoil, clay lumps, gravel larger than 1 inch in diameter, and other objects larger than 2 inches in diameter; free of weeds, roots, and other vegetative or foreign matter.

1.4 SUBMITTALS

A. Product Data: For erosion-control products and any chemical herbicide or stump-treatment products proposed for use.

B. Shop Drawings: Tree and plant protection fencing layout, where required.

C. Survey: Pre-construction topographic survey and a tree survey identifying trees to remain, by size and species, where the contract drawings do not already provide this information.

D. Demolition Plan: Submit a written demolition and removal plan for existing structures and pavement within the clearing limits, including sequencing relative to any facilities scheduled to remain in service.

1. The demolition plan shall identify how continuity of service for any utilities or facilities scheduled to remain in operation will be maintained or temporarily bypassed during demolition activities, in coordination with the Owner.

E. Disposal Documentation: Landfill or recycling facility receipts for all demolition debris, cleared vegetation, and grubbed material removed from the site.

F. Photographs: Pre-construction photographs of the site, all trees to remain, adjacent property lines, and existing pavement/structures to be removed, dated and submitted prior to start of work.

1.5 QUALITY ASSURANCE

A. Demolition work involving structures within 10 feet of any existing facility or utility scheduled to remain in service shall be performed only after coordination with the Owner and, if applicable, with the Owner's maintenance contractor for that facility.

B. Pre-installation Conference: Conduct a conference at the project site prior to start of clearing and demolition activities. Review protection requirements for trees to remain, utility locations, dust and erosion control measures, and disposal procedures.

1.6 PROJECT CONDITIONS

A. Existing Conditions:

1. All existing facilities, utilities, or equipment on the site shall remain in continuous or near-continuous operation throughout construction, unless otherwise coordinated with the Owner.

2. Existing pavement and structures scheduled for removal are shown on the drawings. Contractor shall verify limits of removal in the field prior to commencing work.

B. Utility Locates: Contractor shall arrange for utility locates Louisiana One Call / 811 not less than three (3) full working days prior to start of clearing, grubbing, or demolition activities, and shall additionally verify the location of all underground utilities by potholing or other non-destructive means before mechanized excavation within 10 feet of any utility scheduled to remain in service.

C. Protection of Existing Facilities:

1. Do not interrupt service to any existing facility or utility scheduled to remain in operation without not less than 72 hours' written notice to the Owner, except in an emergency.

2. Protect existing structures, utilities, and equipment scheduled to remain from damage during clearing, grubbing, and demolition operations. Damage to these items as a result of the Contractor's operations shall be repaired at no cost to the Owner.

3. Do not store demolition debris, stockpiled soil, or equipment within protection or buffer areas or outside limits of construction per suggested sequence of construction shown on the drawings.

D. Environmental Requirements: Comply with applicable Louisiana Department of Environmental Quality erosion and sediment control requirements, and take precautions to prevent debris, fuel, or other contaminants from entering storm drainage or adjacent water bodies.

1.7 REFERENCE POINTS AND SURVEY CONTROL

A. Protect and maintain all survey reference points, benchmarks, property corners, and other control points from dislocation or damage during clearing, grubbing, and demolition operations. Immediately repair or replace, at the Contractor's expense, any reference point damaged, destroyed, or dislocated as a result of the Contractor's operations, using a licensed surveyor.

B. Accurately locate the building, existing utility lines, pavement, and curbs shown on the drawings before beginning clearing and demolition, and set grade stakes securely. Maintain grade stakes and other layout markers in place until no longer required for construction, replacing any disturbed or destroyed during the work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil: As defined in Part 1.3 of this Section; stockpiled on-site topsoil meeting this definition may be reused, subject to Engineer's approval.

B. Tree Protection Fencing: High-visibility orange polyethylene mesh fencing, minimum 4 feet high, supported on metal T-posts at maximum 8 feet on center.

C. Erosion Control Products: Per Section 31 25 00.

D. Backfill Material: Where demolished slab or pavement removal results in excavations requiring backfill prior to subsequent construction, backfill per Section 31 20 00.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verify that existing plant life, trees, and other features designated to remain are tagged or otherwise identified before clearing operations begin.

B. Install tree and plant protection fencing at the drip line of trees to remain, or as otherwise shown on the drawings, before any clearing, grubbing, or demolition equipment is mobilized on site.

C. Flag and protect any existing facilities, utilities, or features designated to remain before beginning work.

D. Notify the Owner not less than 72 hours before beginning any work that may affect operation, access, or utility service to facilities scheduled to remain in use.

3.2 CLEARING

A. Clear areas within the limits of construction of trees, shrubs, brush, and other vegetation not designated to remain.

B. Remove trees and brush by cutting at or near grade unless grubbing of the root system is also required by Part 3.3.

C. Do not remove or damage trees, shrubs, or other vegetation designated to remain or located outside the limits of construction.

D. Pruning of trees to remain that interferes with construction access shall be performed in accordance with ANSI A300, by personnel qualified per ANSI Z133.1.

3.3 GRUBBING

A. Grub areas within the limits of construction to remove stumps, roots, and matted root systems to a minimum depth of 18 inches below existing or proposed finish grade, whichever is lower.

B. Fill and compact depressions resulting from grubbing operations with satisfactory soil material in accordance with Section 31 20 00.

3.4 DEMOLITION OF EXISTING STRUCTURES AND PAVEMENT

A. General:

1. Demolish and remove existing structures, pavement, curbing, and aggregate base within the limits of construction shown on the drawings.

2. Saw-cut existing pavement to remain at a clean, straight line at the limits of removal. Do not allow pavement removal to feather out or spall beyond the saw-cut line.

3. Do not use methods that produce excessive ground vibration, impact, or shock loading within 25 feet of any structure or utility scheduled to remain without prior approval of the Structural Engineer.

B. Below-Grade Obstructions:

1. Remove existing foundations, footings, and below-grade obstructions within the limits of construction to a minimum depth of 2 feet below proposed subgrade, or as otherwise required for new construction shown on the drawings and as directed by the geotechnical report titled NOHS Parking Garage – Geotechnical Report (Terracon Project No. 1000027988) dated August 20, 2026.

2. Where below-grade obstructions are encountered that are not shown on the drawings and that may affect adjacent structures or utilities, stop work in that area and notify the Engineer before proceeding.

C. Existing Utilities:

1. Cap, abandon, remove, or relocate existing utilities within the clearing and demolition limits as shown on the drawings or as directed by the Engineer.

2. Coordinate disconnection and capping of any utility serving facilities scheduled to remain with the Owner prior to disconnection. Maintain continuity of service except during approved, scheduled outages.

D. Pavement and Slab Disposal: Legally dispose of demolished concrete, asphalt, and aggregate base off-site, unless the Owner has approved on-site crushing and reuse as engineered fill per Section 31 20 00.

3.5 TOPSOIL STRIPPING

A. Strip topsoil to the full depth present, to a maximum depth of 12 inches, from areas within the limits of construction prior to grading, demolition, or grubbing operations, except as otherwise directed.

B. Stockpile stripped topsoil in a location approved by the Engineer, outside areas of vehicular traffic and outside any designated protection or buffer areas.

C. Protect topsoil stockpiles from erosion and contamination per Section 31 25 00.

3.6 DISPOSAL

A. Remove cleared vegetation, grubbed stumps and roots, and demolition debris from the site. Do not bury or burn debris on site.

B. Transport and dispose of removed materials in accordance with applicable Louisiana Department of Environmental Quality solid waste regulations and local ordinances.

C. Excess Earthen Material: Where the Owner elects to retain excess satisfactory earthen material rather than requiring off-site disposal, such material remains the property of the Owner and shall be hauled and deposited by the Contractor at a location on the Owner's property, but outside the limits of construction, as directed by the Engineer. Coordinate this option with the Owner before excavation begins; absent such direction, dispose of excess material off-site per Part 3.6.B above.

D. Maintain disposal documentation per Part 1.4 of this Section and submit copies to the Engineer.

3.7 FIELD QUALITY CONTROL

A. Engineer will observe clearing, grubbing, and demolition operations periodically to verify compliance with the limits of construction and protection requirements of this Section.

B. Notify Engineer not less than 24 hours before each of the following:

1. Commencement of clearing and grubbing operations.
2. Commencement of demolition within 25 feet of any structure or utility scheduled to remain in service.
3. Any unanticipated below-grade obstruction encountered within designated protection or buffer areas.

3.8 CLEANUP

A. Remove tree protection fencing and erosion control measures only after acceptance of finish grading in the affected area, or as directed by the Engineer.

B. Leave the site free of debris, rubbish, and demolished material at the completion of work under this Section.

END OF SECTION 31 10 00

SECTION 31 20 00
EARTH MOVING

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating and backfilling for structures, building pads, and site grading.
2. Excavating, bedding, and backfilling for utility trenches, including water distribution, storm drainage, and other site civil utility and conduit installations.
3. Subgrade preparation and proof-rolling.
4. Placement and compaction of structural fill and engineered fill.
5. Rough and finish grading of the site, including swales and drainage features shown on the drawings.
6. Excavation support, sheeting, and shoring, where required by trench depth or soil conditions.
7. Dewatering of excavations, where required.
8. Placement of finish topsoil over disturbed, non-paved areas.
9. Post-construction maintenance of graded and compacted areas through final acceptance.
10. Disposal of unsuitable or surplus excavated material off-site, or to an Owner-directed on-site location where elected by the Owner.
11. Restoration of pavement, curb, gutter, sidewalk, driveway approaches, topsoil, turf, and landscaping disturbed by trenching operations.

B. Related Requirements:

1. Section 31 10 00 – Site Clearing.
4. Section 33 05 00 – Common Work Results for Utilities, for pipe materials, joints, and appurtenances.
5. Section 33 11 00 – Water Distribution Piping.
6. Section 33 42 00 – Stormwater Conveyance.

1.2 REFERENCES

A. ASTM D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (Standard Proctor).

B. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (Modified Proctor).

C. ASTM D2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

D. ASTM D4253/D4254 – Standard Test Methods for Maximum/Minimum Index Density and Unit Weight of Soils.

E. ASTM D6938 – Standard Test Method for In-Place Density and Water Content of Soil by Nuclear Methods.

F. ASTM C33 – Standard Specification for Concrete Aggregates.

G. AASHTO M43 – Standard Sizes of Coarse Aggregate.

H. OSHA 29 CFR 1926, Subpart P – Excavations.

I. NOHS Parking Garage Geotechnical Report by Terracon, dated August 20, 2026, including all recommendations for subgrade preparation, fill material, and compaction.

1.3 DEFINITIONS

A. Structural Fill: Engineered fill placed and compacted to specified density beneath foundations, slabs, pavements, or other load-bearing elements.

B. Subgrade: The surface remaining after completion of excavation, or the top surface of fill, immediately below pavement, slab, or topsoil placement.

C. Unsuitable Material: Material that, in the opinion of the Engineer or geotechnical engineer, is unfit for use as fill or backfill due to excessive moisture content, organic content, deleterious materials, or inadequate strength characteristics.

D. Borrow: Approved fill material obtained from sources outside the project limits.

E. Optimum Moisture Content: The water content, determined by ASTM D698 or D1557 as specified, at which a soil can be compacted to its maximum dry density.

1.4 SUBMITTALS

A. Product Data: For each type of geotextile, drainage fill, and manufactured fill product proposed for use.

B. Material Test Reports: For each proposed fill, borrow, and backfill material, including gradation, Proctor (ASTM D698 or D1557, as specified), and other tests required by the geotechnical report.

C. Excavation and Shoring Plan: Where excavation depth or soil conditions require sheeting, shoring, or sloping per OSHA 1926 Subpart P, submit a plan prepared or reviewed by a qualified person, signed and sealed by a professional engineer where required by the authority having jurisdiction. Where special shoring is required for utility trenches, submit shoring designs prepared, sealed, and signed by a professional civil or structural engineer currently licensed in the state of the project.

D. Trench Excavation Safety Program: Submit a trench excavation safety program in accordance with OSHA 29 CFR 1926 Subpart P, identifying the competent person for excavations. Submittals for trenches five feet or more in depth shall be submitted to the Engineer for review and approval prior to excavation.

E. Dewatering Plan: Where groundwater is anticipated, submit a plan describing proposed dewatering methods and discharge location, including any required permits.

F. Bedding Certification: Submit certification that bedding and pipe-zone material meets this Specification.

G. Field Quality Control Reports: Compaction and density test results, submitted within 3 working days of testing, for each lift of structural fill and trench backfill.

H. Survey: Pre-construction and post-grading topographic survey, where required by the Owner or Engineer. Submit a record (as-built) of the location of utilities installed, referenced to survey control points, including utilities encountered or rerouted, with stations and dimensions.

1.5 QUALITY ASSURANCE

A. Testing Agency: The Owner will engage a qualified geotechnical testing agency to perform material testing and in-place density testing specified in Part 3 of this Section.

B. Conflicting Requirements: Should excavating, filling, or backfilling requirements specified in this Section differ from those set forth in the project geotechnical engineering report, the more stringent requirement governs, except that the Contractor shall adhere to the geotechnical engineering report wherever this Section is silent or where the geotechnical engineer's recommendations are more restrictive.

C. Pre-installation Conference: Conduct a conference at the project site prior to start of earth moving activities. Review subgrade preparation, fill placement and compaction procedures, testing frequency, dewatering, and excavation safety requirements.

D. Regulatory Requirements: Comply with OSHA 29 CFR 1926, Subpart P, for excavation safety, including sloping, benching, shoring, or shielding as required by soil classification and excavation depth.

1.6 PROJECT CONDITIONS

A. Existing Conditions:

1. There exist existing utilities that will potentially guide/direct/impact construction operations (e.g. stormwater, water, etc.).

2. Subsurface conditions are as indicated in the project geotechnical report. The Owner does not guarantee that conditions indicated are representative of those existing throughout the project, or that unanticipated conditions will not be encountered.

B. Utility Locates: Contractor shall arrange for utility locates (Louisiana One Call / 811) not less than 3 full working days prior to start of excavation, and shall verify the location of utilities shown on the drawings or otherwise known to exist within the work limits by potholing or other non-destructive means prior to mechanized excavation in their vicinity.

C. Protection of Existing Facilities:

1. Protect existing structures, pavements, and utilities scheduled to remain from damage during excavation, fill placement, and grading operations. Damage resulting from the Contractor's operations shall be repaired at no cost to the Owner.

2. Where excavation is required adjacent to existing structures or utilities scheduled to remain, provide excavation support adequate to prevent settlement, heave, or lateral movement of the adjacent structure or utility.

D. Protection of Persons – Open Excavations:

1. Barricade open excavations and post warning lights for the safety of persons. Operate warning lights from dusk to dawn each day that an excavation remains open. Well light and barricade trenches, excavated material, equipment, or other obstacles that could be dangerous to the public.

2. Notify the Owner's facility operations staff of the need to keep an excavated area open for an extended period.

E. Environmental Requirements: Comply with applicable Louisiana Department of Environmental Quality erosion and sediment control requirements. Do not permit excavated or stockpiled material to enter storm drainage systems or adjacent water bodies.

PART 2 – PRODUCTS

2.1 FILL MATERIALS

A. Satisfactory Soil Materials: Refer to Geotechnical Report.

B. Unsatisfactory Soil Materials: Refer to Geotechnical Report.

C. Structural Fill: Refer to Geotechnical Report.

D. Ordinary Fill: Refer to Geotechnical Report.

E. Engineered/Select Fill: Refer to Geotechnical Report.

F. Borrow: Satisfactory soil material from off-site sources, subject to the testing and approval requirements of Part 1.4.

2.2 UTILITY TRENCH MATERIALS

A. Bedding Material: Clean earth fill composed of crushed stone, sand, sand and clay, sand and rock, or crushed rock, free of organic matter and frozen material, with particles not larger than 1/2 inch, as required by the pipe manufacturer and the project geotechnical report. Use bedding material suited to the pipe size and manufacturer's requirements for pipe up to 24 inches in diameter and for pipe greater than 24 inches in diameter, unless otherwise indicated.

B. Initial Backfill: Satisfactory soil material or bedding material, as specified by pipe type, placed and compacted to protect the pipe from damage during subsequent backfill.

C. Final Backfill: Satisfactory soil material, compacted as specified in Part 3, up to subgrade or finish grade. Common fill (on-site or select backfill) may be used for backfilling trenches in open, unpaved areas, free of debris, organic material, and frozen material, and containing no rocks greater than 1/2 inch in diameter. In paved areas and within the limits of pavement structural sections, final backfill shall be select granular material, as indicated.

D. Warning Tape: Detectable warning tape, color-coded per utility type, installed 24 inches above buried utilities, per Section 33 05 00.

2.3 GEOTEXTILES AND ACCESSORIES

A. Separation Geotextile: Woven or non-woven geotextile fabric, as specified in the geotechnical report, for use between subgrade and fill where required to prevent migration of fines.

B. Geogrid: Where specified in the geotechnical report for subgrade stabilization, biaxial or uniaxial geogrid as recommended.

C. Filter Fabric: Provide geotextile separator/filter fabric for utility trenches where indicated or where directed by the Engineer, of a type suited to the adjacent soil gradation and the drainage or separation function required.

2.4 TOPSOIL

A. Free from vegetation, wood, manure, stones larger than 2 inches in any dimension, and other extraneous or toxic matter.

B. Within fenced or landscaped areas designated on the drawings, topsoil shall be a rich, fertile, friable soil, loamy in texture, free from clay lumps, and obtained by the Contractor from a source other than the Owner's property.

C. Outside the areas described above, topsoil may be material generated by required on-site excavation, or borrow material meeting the requirements of Part 2.1.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify that site clearing under Section 31 10 00 has been completed within the limits of work before beginning excavation or grading.

B. Verify that utility locates have been completed and that the locations of known utilities have been field-verified before beginning mechanized excavation.

C. Proof-roll subgrade in areas to receive fill, slabs, or pavement, using equipment specified by the geotechnical engineer, in the presence of the testing agency. Identify and remediate soft, yielding, or unstable areas as directed by the geotechnical engineer before proceeding.

3.2 EXCAVATION, GENERAL

A. Excavate to the lines, grades, and elevations shown on the drawings, allowing for the thickness of fill, slab, pavement, or other materials to be placed.

B. Excavation Classification: Excavation is unclassified. Excavate material encountered, regardless of type, character, composition, or condition, to the lines, grades, and elevations indicated.

C. Excavated Material:

1. Stockpile satisfactory excavated material for reuse as fill or backfill, separately from unsatisfactory material, in locations approved by the Engineer.

2. Remove unsatisfactory material and surplus satisfactory material not required for fill or backfill from the site, and legally dispose of it off-site.

D. Do not excavate beyond the dimensions and depths required. Where over-excavation occurs, backfill with structural fill, compacted as specified in Part 3.7, at no additional cost to the Owner.

E. Stability of Excavations: Slope sides of excavations to comply with applicable codes and OSHA 1926 Subpart P requirements, or provide sheeting, shoring, or shielding where sloping is not practicable.

F. Dewatering: Where groundwater or surface water is encountered, remove water by pumping or other approved method to keep excavations dry, and discharge in accordance with the approved dewatering plan and applicable LDEQ requirements.

3.3 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions, to provide working clearance around forms, foundations, and other construction as shown, extending a sufficient distance from footings and foundations to permit placing and removal of formwork, installation of services, and inspection.

B. Over-Excavation Tolerance: Conform to elevations and dimensions shown, with a tolerance for over-excavation not to exceed 0.10 foot.

C. Excavations for footings and foundations shall not be disturbed below the design bearing elevation prior to placing concrete. Notify the Engineer or geotechnical engineer if bearing soils differ from those anticipated in the geotechnical report.

D. Hand trim excavations for footings, foundations, and slabs to required lines and grades just before concrete is placed; remove loose matter to leave a solid base.

E. Conditions of Excavation: Before placing vapor barrier membranes, reinforcing steel, or concrete, bottoms of excavations shall be relatively dry, smooth, leveled, and free of debris, in a condition allowing the Engineer to inspect and authorize the area prior to concrete work.

F. Lining, Bracing, and Protecting: Thoroughly line and brace the walls and sides of excavations as required to protect against caving or settlement and to maintain the plumbness or line of excavation indicated, in addition to the excavation support requirements in other sections of these specifications. The Contractor is responsible for maintaining excavations free from cave-ins.

3.4 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to the depth and width required for the pipe or conduit being installed, plus working clearance specified by the pipe manufacturer or shown on the drawings. In paved areas, saw cut pavement in straight lines at least 1 foot outside the trench line, to the full depth of the pavement structural section.

B. Grade trench bottoms to provide uniform bearing and support for pipe at every point, except where pipe is to be supported on bedding material.

C. Where unyielding material is encountered at or below trench bottom grade, over-excavate a minimum of 4 inches and replace with bedding material before pipe installation.

D. Length of Open Trench: Unless otherwise approved by the Engineer, do not excavate trenches more than 100 feet in advance of pipe installation, and do not leave more than 25 feet of excavated trench unbackfilled at the end of the day. Where a greater length cannot be avoided, plate and barricade the trench for public safety.

E. Excavation Support: Provide sheeting, shoring, or shielding for trenches in accordance with OSHA 1926 Subpart P, based on soil classification and trench depth.

F. Barricade and light trenches, excavated material, equipment, or other obstacles that could be dangerous to the public.

G. Inspect all pipe materials, fittings, and accessories on site for damage and defects prior to installation; advise the Engineer of all defective materials.

3.5 SUBGRADE PREPARATION

A. Proof-roll and compact subgrade in areas to receive fill, slabs, or pavement to the density specified in Part 3.7, to a depth of 12 inches below subgrade elevation, unless otherwise specified by the geotechnical report.

B. Remove and replace soft, yielding, or otherwise unsuitable subgrade areas identified during proof-rolling with structural fill, compacted as specified.

C. Where geotextile or geogrid is specified by the geotechnical report, place over prepared subgrade per manufacturer's instructions before fill placement.

3.6 CORRECTION OF UNAUTHORIZED EXCAVATION

A. Excess Undercut to Receive Fill: Fill with increased depth of acceptable fill material, compacted as specified in this Part.

B. Under Footings or Foundation Bases: Fill unauthorized excavation by extending the indicated bottom elevation of the footing or base to the excavation bottom, without altering the required top elevation. 3,000 psi concrete fill may be used to bring elevations to proper position, only when acceptable to the Engineer.

C. Elsewhere: Backfill and compact unauthorized excavations as specified for fill of the same classification, unless otherwise directed by the Engineer.

D. Water Control: Perform earthwork to prevent surface water and groundwater from flowing into excavations and to prevent flooding of the project site and surrounding areas.

1. Do not allow water to accumulate in excavations. Remove water using dewatering methods that prevent softening or change of the soil. Provide and maintain pumps, sumps, suction and discharge lines, and other dewatering components necessary to convey water away from excavations.

2. Convey water removed from excavations, and rainwater, to collecting or run-off areas. Provide and maintain temporary drainage ditches and other diversions outside excavation limits. Do not use excavations as temporary drainage ditches.

E. Material Storage: Stockpile satisfactory materials until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.

3.7 FILL AND BACKFILL PLACEMENT

A. General:

1. Place fill and backfill only on subgrade that has been examined, tested, and approved as specified in Part 3.1 and 3.5.

2. Place fill and backfill materials in horizontal lifts not exceeding 9 inches in loose thickness, unless a greater lift thickness is approved by the geotechnical engineer based on field compaction trials.

3. Before compaction, moisten or aerate each layer as necessary to achieve optimum moisture content, and compact to the density specified in Part 3.7.C before placing the next lift.

4. Do not place backfill or fill material on surfaces that are muddy, frozen, or that contain frost or ice, or on an otherwise unsound surface. Do not deposit, tamp, roll, or otherwise mechanically compact backfill in standing water.

5. Place backfill and fill materials evenly adjacent to structures, to required elevations, carrying material uniformly around the structure to approximately the same elevation in each lift to prevent wedging action against the structure.

6. Backfill excavations as promptly as work permits, but not until completion of waterproofing operations, underground utility installation, inspection and testing, removal of concrete formwork, and removal of trash and debris from the excavation.

B. Trench Backfill:

1. Place bedding material for the full width of the trench prior to laying pipe.

2. Place initial backfill in the pipe zone by hand or light mechanical means, in layers not exceeding 6 inches (loose measure), to avoid damage to pipe or conduit and to compact uniformly on both sides of the pipe to prevent lateral displacement.

3. The trench shall not be backfilled above the pipe zone until the pipe installation has been inspected and found acceptable by the Engineer.

4. Place final backfill in lifts as specified in Part 3.7.A, compacted to the density specified in Part 3.7.C, up to subgrade or finish grade. Maintain the moisture content of trench backfill within 2 percent of optimum (per ASTM D698 or D1557, as specified) for each lift.

5. Do not operate heavy compaction or hauling equipment directly over pipe until a minimum cover, as specified or as required to prevent pipe damage, has been achieved.

6. Install warning tape over buried utilities at the depth specified in Part 2.2.

C. Compaction Requirements:

1. Structural fill under footings, foundations, and building pads: compact to not less than 95 percent of maximum dry density per ASTM D698, unless otherwise specified by the geotechnical report.

2. Structural fill in the upper 12 inches beneath the parking deck: compact to not less than 98 percent of maximum dry density per ASTM D698, unless otherwise specified by the geotechnical report.

3. Trench backfill under pavements and within 5 feet of structures: compact to not less than 95 percent of maximum dry density per ASTM D1557, unless otherwise specified by the geotechnical report.

4. Lawns and unpaved areas, including trench backfill in those areas: compact to not less than 90 percent of maximum dry density per ASTM D698.

D. Moisture Control: Where subgrade or a layer of soil material must be moisture-conditioned before compaction, uniformly apply water to the surface to prevent free water from appearing during or after compaction.

1. Remove or replace, or scarify and air dry, soil material that is too wet to permit compaction to the specified density.

2. Acceptable soil material removed because it is too wet may be stockpiled or spread and allowed to dry, assisted by disking, harrowing, or pulverizing, until moisture content is reduced to a satisfactory value as determined by moisture-density relation tests. When accepted by the testing agency, this material may be reused as backfill or fill.

3.8 GRADING

A. Rough Grading: Grade site to within 1/2 foot of indicated elevations, providing positive drainage away from structures and toward designated drainage features.

B. Finish Grading: Grade areas to receive topsoil, pavement, or other finish materials to the tolerances required by the applicable finish section.

C. Grassed Areas: Finish areas to receive topsoil to within not more than 0.10 foot above or below required elevations, allowing for the required thickness of topsoil. Fill as needed to reach required elevations.

D. Fence Lines: Grade an area 10 feet wide along fence lines to provide a uniform base for fencing. Cut and fill as necessary to limit variation from a true line to 6 inches per 100 feet. Slopes, except at ditch crossings, shall be 4:1 or flatter.

E. Shape and rework existing ditches, and construct new ditches, to the dimensions, lines, and grades shown, allowing for the thickness of topsoil and erosion protection where required.

F. Do not create ponding conditions in areas not specifically designed as detention or retention features. Notify the Engineer of any condition that, in the Contractor's opinion, will result in ponding or inadequate drainage.

3.9 TOPSOIL PLACEMENT

A. Furnish, place, and fine-grade a 4-inch layer of topsoil over all ground surface disturbed by construction operations, including filled areas, that is not occupied by the building, pavements, the parking deck, aggregate surfacing, or similar improvements.

3.10 MAINTENANCE

A. Protect newly graded areas from traffic and erosion, and keep free of trash and debris.

B. Protect completed trench backfill from erosion, settlement, or damage until final surface restoration is complete. Maintain erosion and sediment control measures throughout the construction period in accordance with Section 31 25 00.

C. Repair and re-establish grades in settled, eroded, or rutted areas to the tolerances specified in this Section.

D. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and recompact to the required density before further construction.

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Engage the testing agency specified in Part 1.5 to perform the following:

1. In-place density tests of each lift of structural fill and trench backfill, per ASTM D6938 or other method approved by the geotechnical engineer, at a frequency of not less than one (1) test per 2,500 square feet per lift for structural fill, and one (1) test per 150 linear feet of trench per 12 inches of vertical lift for trench backfill, or as otherwise specified by the geotechnical report.

2. Proctor tests (ASTM D698 or D1557, as specified) for each material source used as fill or backfill, and as material sources change.

B. Notify Engineer not less than 24 hours before each of the following:

1. Commencement of excavation for structures or utility trenches.

2. Proof-rolling of subgrade.

3. Placement of structural fill.

C. If test results indicate fill or backfill does not meet specified density or moisture criteria, rework, recompact, or replace the affected area and retest, at the Contractor's expense, until specified results are achieved.

D. Document all testing results, locations, and any corrective actions taken, and submit to the Engineer.

3.12 DISPOSAL

A. Remove from the project site and dispose of excavated material not used for fill or backfill, excess borrow material, trash, and waste materials.

B. Legally dispose of unsatisfactory excavated material and surplus satisfactory material not required for fill or backfill, off-site, in accordance with applicable Louisiana Department of Environmental Quality solid waste regulations and local ordinances.

C. Excess Earthen Material: Where the Owner elects to retain excess satisfactory excavated soil material rather than requiring off-site disposal, such material remains the property of the Owner and shall be hauled and deposited by the Contractor at a location on the Owner's property, but outside the limits of construction, as directed by the Engineer. Deposit and grade this material as necessary to prevent ponding of rainwater and to permit drainage. Coordinate this option with the Owner before excavation begins; absent such direction, dispose of excess material off-site per Part 3.12.B above.

D. Maintain disposal documentation and submit copies to the Engineer upon request.

3.13 RESTORATION

A. Restore pavement, curb, gutter, sidewalk, and driveway approaches disturbed by trenching to a condition equivalent to that existing prior to construction, in accordance with the applicable paving/concrete specification section and the local jurisdiction's cut/patch standard.

B. Restore areas of disturbed topsoil, turf, or landscaping to match adjacent existing conditions.

3.14 CLEANUP

A. Remove excess fill material, debris, and equipment from the site upon completion of earth moving operations in each area.

B. Repair and restore areas disturbed by earth moving operations outside the limits of construction to a condition equal to or better than existing conditions, at no cost to the Owner.

END OF SECTION 31 20 00

SECTION 313116 - TERMITE CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Soil treatment for termite control.

B. Related Sections:
   1. Section 03 30 00 - Cast-In-Place Concrete: Slabs on grade and foundations placed over treated soil.

1.2 REFERENCES

A. Environmental Protection Agency:
   1. EPA FIFRA - Federal Insecticide, Fungicide and Rodenticide Act.

B. National Pest Management Association:
   1. NPMA WDO - Wood Destroying Organism Library.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit toxicants to be used, composition by percentage, dilution schedule, intended application rate. Include product label information.

C. Test Reports: Indicate regulatory agency approval reports.

D. Manufacturer's Application Instructions: Indicate caution requirements and in accordance with current product label of chosen pesticide.

E. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

F. Certify applications followed NPMA WDO for termite control or other regional location guidance.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record moisture content of soil before application, date and rate of application, areas of application, diary of toxicity meter readings and corresponding soil coverage.

C. Operation and Maintenance Data: Indicate re-treatment schedule.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with documented experience.

1.6 SEQUENCING

A. Section 01 10 00 - Summary: Work sequence.

B. Apply toxicant immediately prior to installation of vapor barrier under slabs-on-grade in accordance with product label supplemented by the NPCA’s ARP for termiticiding or local requirements.

1.7 WARRANTY

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for warranties.

B. Furnish one year warranty with option to renew for continuous protection.

C. Warranty: Include coverage for damage and repairs to building and building contents caused by termites. Repair damage. Re-treat where required.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufacturers:
   1. BASF Model Termidor SC.
   2. Bayer Environmental Science Model Premise.
   3. Substitutions: Section 01 60 00 - Product Requirements.

B. Toxicant Chemical: EPA FIFRA, local authority approved; synthetically color dyed to permit visual identification of treated soil, Imidacloprid..

C. Diluent: Recommended by toxicant manufacturer.

2.2 MIXES

A. Mix toxicant to manufacturer's instructions.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify soil surfaces are unfrozen, sufficiently dry to absorb toxicant, and ready to receive treatment.

C. Verify final grading and excavation are complete.

3.2 APPLICATION

A. Apply toxicant at locations indicated in Schedule at end of section.

B. Apply extra treatment to structure penetration surfaces including pipe or ducts, and soil penetrations including grounding rods or posts.

C. Re-treat disturbed treated soil with same toxicant as original treatment.

D. When inspection or testing identifies presence of termites, re-treat soil and re-test.

3.3 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished Work.

B. Do not permit soil grading over treated work.

3.4 SCHEDULES

A. Locations:
   1. Under Slabs-on-Grade.
   2. Both Sides of Foundation Surface.

END OF SECTION 313116

SECTION 316316 – AUGERCAST GROUT PILING

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Install piling and related items as shown on the drawings and as specified herein.

B. Piling subcontractor shall be an established, qualified, and experienced firm regularly engaged in placing auger cast grout piles. He shall use necessary standard equipment, experienced operators and workmen, and other necessary items to expediently complete this work. His equipment, personnel, and method of placing the piles shall be subject to the approval of the Architect or his authorized representative.

1.2 DESCRIPTION OF WORK

A. Provide labor, material, equipment, and supervision necessary to furnish and install auger cast grout piling.

B. Although not specifically set forth herein, all miscellaneous items, appurtenances and devices incidental to or required for a sound, secure and complete installation, shall be provided as a part of this work.

C. The piles shall be located in the field in accordance with the drawings. The Contractor shall furnish records of three (3) past successful installation of piles under similar soil conditions. Prior to commencing work, the Contractor shall submit for review details of the piles to be furnished, including shop drawings of the pile, proposed method of drilling, and data sheet on the type and capacity of the drilling equipment.

D. The Contractor shall include in his bid, the price required to account for 50% grout overage during the installation of the auger cast pile foundations. The Contractor shall also include a single unit price on the bid form to account for grout overage above or below 50%. If the grout overage is less than 50%, the Owner will be credited the amount of grout overage less than 50% times the unit price. If the grout overage is more than 50%, the Owner will issue a change order for the amount of grout overage above 50% times the unit price. The grout overage only applies to the grout that goes into the foundation excavations as recorded by the testing laboratory. The cost of all other grout purchased by the Contractor shall be included in the base bid.

1.3 QUALITY ASSURANCE

A. Testing Lab:

a. The testing laboratory, under the supervision of the Geotechnical Engineer of Record, is to log the placement of each pile and furnish the Architect and Structural Engineer with weekly detailed drilling logs. The testing and inspection is to be performed in

accordance with ASTM E-329. Also see Section 01 40 00 – TESTING LAB SERVICES.

1. Review the qualifications and equipment of the Piling Subcontractor;
2. Review the grout design to confirm that the mix meets project requirements;
3. Provide one (1) competent and experienced laboratory field man per each rig to be present during pile placement and to keep records relative to drilling and conditions encountered.

B. Installation Tolerances:

a. Deviation shall not be more than ¼ inch per foot from the vertical or batter line, with a total deviation of the head of pile not more than two inches from plan location. Finished elevation to be no more than 1-1/2 inches above or below the design elevation.

C. Flow-Cone Test:

a. Use quantity of water to produce a grout equivalent to a consistency of flow of not less than 15 seconds when tested with a flow cone in accordance with Corps of Engineers CRD C-79.

D. Testing of Mortar:

a. One set of six (6) 2 inch cubes made each day while pile casting with two cubes of each set tested after three (3) days, two (2) cubes of each set tested after seven (7) days and two (2) cubes of each set tested after 28 days. Cubes shall be made and tested in accordance with ASTM C-109.

E. Volume of Pile:

a. The amount of grout placed in each piling shall be recorded and that amount shall not be less than 115% of the theoretical volume of the augered hole.

F. Depth and Alignment of Auger:

a. Provide an accurate means of determining the depth and alignment of the auger.

G. Pressure Gages:

a. Provide grout pressure gauges which accurately indicate displacement pressure at the pump;
b. It is intended that a 50 psi pressure be maintained at the tip of the auger at all times. The foreman shall control the withdrawal rate of the auger to maintain the above specified minimum pressure level at the tip of the auger;
c. The Piling Foreman shall have not less than three (3) years experience in placing augered piling in soft soils, and he shall maintain continuous observation of grout pressure in the discharge system;
d. Provide gauge savers to protect gauges from grout. Clean gauges daily to prevent grout blockage. Replace inaccurate gauges with new gauges.

H. Testing of Piles:

a. In addition to pile load test Sec. 3.04, piles may be subjected to single-hole sonic logging (SSL) where installation records indicate that structural defects or anomalies may exist. If structural defects or anomalies are found, it will be the Contractor's responsibility to pay for the testing. If no defects or anomalies are found, it will be the Owner's responsibility to pay for the testing.

1.4 SUBMITTALS

A. Prior to beginning work, submit information on the following to the Architect:

a. Types and ratings of drilling equipment;
b. Outline of placement methods;
c. Grout mix design;
d. Augering equipment;
e. Pile details.

B. During Work:

a. Testing and Inspection Laboratory:
Prepare log of the following:
1. Identify pile by location, number and date of installation;
2. Record size and length;
3. Record elevations of the top of ground, top of shaft concrete, and bottom of pile;
4. Pile pay length, theoretical and actual grout volumes, the grout factor and pumping pressures;
5. Length and size of pile reinforcing, including projection above top of pile;
6. Drilling characteristics.

b. Submit load test data and results.

1.5 RELATED WORK SPECIFIED ELSEWHERE

A. Reinforcing for piling: Section 03 20 00.

PART 2 – PRODUCTS

2.1 AUGERCAST CONCRETE PILES

A. High Strength Grout Materials: Mix as Portland Cement, fluidifier and/or retarder, sand and water so proportioned and mixed as to provide a grout capable of maintaining the solids in suspension without appreciable water gain, yet which may be placed without difficulty, and which will laterally penetrate and fill any voids in the foundation material. Mineral filler may be added to the above mix in lieu of a small percentage of the Portland Cement at the Piling Contractor's option. The materials shall be so proportioned as to provide a hardened grout having an ultimate compressive strength of 4,000 psi at 28 days. The grout design shall include the following typical ingredients and shall be submitted to the Geotechnical Engineer of Record for review prior to construction:

a. Portland Cement: Portland Cement shall conform to ASTM C 150, Type I or Type III;
b. Pozzolan (when approved): Pozzolan shall be a fly ash or other approved pozzolanic material conforming to ASTM C 618;
c. Grout fluidifier: Grout fluidifier shall conform to Corps of Engineers CRD C-566, except that expansion shall not exceed 4%. The fluidifier shall be a compound possessing characteristics which will increase the flowability of the mixture, assist in the dispersal of cement grains, and neutralize the setting shrinkage of the high-strength cement mortar;
d. Water: Water shall be fresh, clean, potable, and free from sewage, oil, acid, alkali, salts, or organic matter;
e. Fine aggregate: Fine aggregate shall meet the requirements of ASTM C33. The sand shall consist of hard, dense, durable, uncoated rock particles and be free from injurious amounts of silt, loam, lumps, soft or flaky particles, shale, alkali, organic matter, mica, and other deleterious substances. If washed, a washing method shall be used that will not remove desirable fines, and the sand shall subsequently be permitted to drain until the residual-free moisture is reasonably uniform and stable. The sand shall be well graded from fine to coarse with fineness modulas between 1.30 and 3.40. The fineness modulus if defined as the total divided by 100 or the cumulative percentages retained on U.S. Standard Sieve numbers 16, 30, 50, and 100;
f. Mineral Filler (if required): Finely powdered siliceous material which combines lime liberated during Portland cement hydration.

B. Augering Equipment:

a. Grout pump: Use a positive displacement piston pump of an approved design, capable of developing displacing pressure at the pump up to 350 psi. Calibrate the pump discharge capacity in strokes per cubic foot or revolutions per cubic by a method approved by the Architect. Remove oil or other rust inhibitors from mixing drums and pressure grout pumps prior to mixing and pumping. Equip pump with digital counter for counting pump strokes to determine volume of grout pumped.
b. Crane: Use crane equipped with torque convertor or hydraulic drive system to permit a slow continuous auger lifting (grouting operation).
c. Auger: Use 3” minimum I.D. hollow shaft auger to facilitate grout flow. The hole through which the high strength grout is pumped during the placement of the pile shall be located at the bottom of the auger head below the bar containing the cutting teeth. The auger flighting shall be continuous from the auger head to the top of auger with no gaps or other breaks. The pitch of the auger flighting shall be a minimum of 9 inches.
d. Auger Drive: Use auger drive head having minimum static weight of 4,000 pounds and drive 150 horsepower. The piling leads shall be prevented from rotating by a stabilizing arm.

PART 3 – EXECUTION

3.1 PILING INSTALLATION

A. General: Provide piling of the length and configuration necessary to:

a. Achieve the required penetration determined by the Architect;
b. Extend into the pile cap or structure footing the indicated length;

c. Attain the indicated bearing capability.

B. Install piling to the required elevation. The piling subcontractor's method and procedure of drilling, injecting of the grout, withdrawal of the auger, as well as the other pile-placing procedures shall be initially monitored by a representative of the Geotechnical Engineer of Record.

C. Excavation of the pile shall be completed after augering and grouting. Completely fill the augered hole with grout and sleeve to cutoff elevation.

D. Feed materials to the mixer accurately measured by weight, except water, which may be measured by volume. The order of placing the material shall be as follows:

a. Water;
b. Fluidifier and other solids in order of increasing particle size. Time of mixing shall not be less than one minute. Ready-mix grout may be used.

E. The continuous hollow shaft flight auger shall be rotated into the ground to the required depth of penetration as shown on the plans and specified herein. The auger shall remain full of earth to prevent lateral cave-in of the clay and sand soils.

F. When the auger has penetrated to the required depth, concrete shall be pumped through the shaft under a pressure at discharge of about 50 psi. The auger shall continue to be rotated slowly (3 – 5 RPM) in a forward (digging) direction and then shall be slowly withdrawn, allowing the concrete under pressure to fill the shaft and to penetrate laterally into any porous soils as the auger is withdrawn. The auger shall not be allowed to "get ahead" of the concrete and allow soils to cave into the shaft. This can be detected by a drop in pressure at the pump. This procedure shall continue without break from bottom to top of piling.

G. It shall be required that a high grout discharge pressure be maintained at all times during pile construction to eliminate the possibility of intrusion of soils and/or water into the grout column under these conditions.

H. If the auger jumps upward more than 6 inches but less than 12 inches (12") during withdrawal, reinsert auger at least three feet past the questionable area and re-grout the pile.

I. If the auger jumps upward more than 12 inches (12") during withdrawal, or the pile is not installed in general accordance with accepted procedures, reinsert auger to the base of the pile and re-grout the pile.

J. Auger grout injected pile reinforcement is to be as shown on the plans.

K. Grout volume: The volume of grout per linear foot of pile shall not be less than the theoretical volume of the augered hole. The subcontractor shall provide calibrated equipment to make sure measurements.

L. Protection of piles: Provide a sequence of pile installation such that adjacent piles are not disturbed. Evidence of disturbance may appear as a drop in the grout surface. Do not place pile within three feet (3') of adjacent piles until the grout in the piles has undergone initial set.

M. The uppermost eighteen inches (18”) of all piling shall be contained by a rigid sleeve. This sleeve shall be removed after the concrete has set.

3.2 LOCATION OF PILES

A. Piles shall be located as shown on drawings or as otherwise directed by the Architect. Pile centers shall be located to an accuracy of +-2”. In the event that non-augerable material is encountered which prevents placing of a pile to the depth required, the short pile shall be completed and, if necessary, an additional adjacent pile placed as directed by the Architect.

3.3 CUT-OFFS

A. Cut piles off after excavation or pile caps at elevations shown on drawings.

3.4 LOAD TESTS AND TEST PILES

A. Test piling(s) shall be constructed at the locations designated by the Geotechnical Engineer of Record. These pilings shall be constructed using the same materials, equipment, and labor that will be used for the remainder of the piling. Pile(s) shall be constructed to the required depth below cut-off. The test piling shall be completed also as described previously. The test piling shall not be utilized as permanent foundation piles.

B. The Contractor must employ a civil/structural engineer, licensed to practice in the state where this job is located, to design the test shaft apparatus. The Contractor will be required to submit this sealed design to the Architect for approval, including detailed plans of the loading apparatus he intends to use.

C. Pile Test Loads:

a. The Contractor shall include in his bid, the cost to provide and install one test pile, reaction piles and beam. The testing laboratory shall provide everything else necessary to conduct the test including calibrated jack, gages, etc;
b. The load test shall be performed by the Testing Laboratory under the supervision of the Geotechnical Engineer of Record. Pile test load shall be applied in accordance with the specifications ASTM D-1143 (latest issue). The Contractor shall cooperate fully with the testing laboratory.

D. Install test pile(s) in accordance with the Section 3.01 Piling Installation.

E. Install test pile at the location directed by the Geotechnical Engineer of Record.

a. Install test pile vertically;
b. No piles or sheeting shall be driven in the immediate areas during the time a load test is being performed;
c. The Contractor shall construct a suitable platform or platforms, and furnish and install necessary lighting so that pile load test observations can be made and recorded by the testing laboratory. Access to the test pile and platform shall be provided by the Contractor;

d. The Contractor shall completely protect the test pile and the equipment and facilities for observing pile settlements from rain, wind, direct sunlight and damage;
e. Test pile(s) and reaction piles are to set for 14 days prior to the load test.

F. Either withdraw damaged test piles and remove from site or cut them off one foot below any structure to be installed above.

G. Load test requirement: Compression load tests shall be made in accordance with ASTM D-1143. After rebound readings have been taken, the pile shall be loaded to failure. The load testing of the piles shall be used to determine that correct lengths and installation criteria are being used.

H. The Architect reserves the right to require the Contractor to make additional load tests not specified or otherwise indicated in the event that the behavior of the test pile or any other pile shows any peculiarity, erratic action, or otherwise causes suspicion as to the reliability of the safe load capacity.

I. Following the completion of load tests, the Geotechnical Engineer or Record will evaluate the results to verify the pile load capacities presented in the geotechnical report for the project and will make a determination of the required production pile penetrations.

END OF SECTION 316316

DIVISION 32

EXTERIOR IMPROVEMENTS

SECTION 32 13 13
CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete pavement for drives and parking areas.
2. Concrete sidewalks, curb ramps, and walkways.
3. Concrete curbs and gutters integral with paving under this Section.
4. Joints in concrete paving, except joint sealant materials specified in Section 32 13 73.

B. Scope Boundary: This Section governs at-grade concrete paving throughout the project site, excluding paving within the building footprint and excluding the structural parking deck slab.

C. Pavement Schedule:

1. Parking areas receiving concrete: 6-inch thick reinforced concrete pavement over 8-inch thick crushed limestone base over 12” structural fill unless a different thickness is shown on the drawings or required by the geotechnical report.
2. Sidewalks and other concrete paving not subject to vehicular traffic: 4-inch thick unreinforced concrete over 4-inch thick clean sand base, unless otherwise shown on the drawings.
3. This schedule applies to at-grade paving only and does not apply to the structural parking deck slab; refer to the structural drawings.

D. Related Requirements:

1. Section 31 20 00 – Earth Moving, for subgrade preparation and aggregate base.
2. Section 32 13 73 – Concrete Paving Joint Sealants.
3. Section 32 17 23 – Pavement Markings.

1.2 REFERENCES

A. ACI 301 – Specifications for Structural Concrete.

B. ACI 318 – Building Code Requirements for Structural Concrete.

C. ACI 330 – Guide for Design and Construction of Concrete Parking Lots.

D. ASTM C94 – Standard Specification for Ready-Mixed Concrete.

E. ASTM C150 – Standard Specification for Portland Cement.

F. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.

G. ASTM C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

H. ADA Standards for Accessible Design, and applicable Louisiana accessibility requirements, for curb ramps and accessible routes.

I. Louisiana Standard Specifications for Roads and Bridges, 2016 (or latest edition)

1.3 SUBMITTALS

A. Product Data: For curing compounds, joint filler, and admixtures proposed for use.

B. Mix Design: Concrete mix design for each class of concrete proposed, including 28-day compressive strength, air content, slump, and admixtures, prepared in accordance with ACI 301.

C. Shop Drawings: Jointing plan showing location and type of construction, contraction, isolation, and expansion joints.

D. Material Certificates: For reinforcing steel, joint filler, and curing compounds, indicating compliance with specified standards.

E. Concrete Test Reports: Compressive strength test results for each pour, in accordance with Part 3 of this Section.

1.4 QUALITY ASSURANCE

A. Concrete Testing Agency: Engage a qualified testing agency to sample and test concrete during placement, in accordance with Part 3.7 of this Section.

B. Testing Costs: The Contractor shall pay the costs of the concrete testing laboratory, including slump testing, cylinder casting, and 7-day and 28-day break tests, unless a test fails. If a test fails, the cost of subsequent testing, and coring if required by the Engineer, shall be borne by the Contractor, including the cost of corrective measures if a deficiency is substantiated by the testing laboratory and the Engineer determines corrective work is necessary.

C. Pre-installation Conference: Conduct a conference at the project site prior to start of concrete paving. Review subgrade and base preparation, concrete mix design, jointing plan, placement and finishing procedures, curing, and testing requirements.

D. Mockup: Construct a mockup panel, minimum 10 feet by 10 feet for concrete panels and 5 feet by 20 feet for concrete sidewalk, illustrating paving thickness, finish, jointing, and curing method, for approval by the Engineer prior to full-scale placement.

1.5 PROJECT CONDITIONS

A. Weather Limitations: Do not place concrete when ambient temperature is below 40 degrees F and falling, or above 90 degrees F, unless cold-weather or hot-weather concreting procedures complying with ACI 301 are submitted and approved.

B. Do not place concrete during rain, sleet, or snow, or when such weather is imminent, unless adequate protection is provided.

C. Coordinate paving operations with other site work to avoid damage to newly placed concrete from construction traffic before adequate strength is achieved.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

A. Cement: Refer to LSSRB 2016 – Section 901, 1001

B. Aggregates: Refer to LSSRB 2016 – Section 1003

C. Water: Clean and free from deleterious amounts of acids, alkalis, and organic materials.

D. Air-Entraining Admixture: ASTM C260, for concrete exposed to freeze-thaw cycles, where applicable to the project climate.

E. Other admixtures, such as water reducers or accelerators, as required by placement conditions and approved by the Engineer.

2.2 CONCRETE MIX

A. Pavement and Parking Areas: Minimum 28-day compressive strength of 4,000 psi, maximum water-cementitious ratio of .45, air content of 3 to 6 percent, slump of 3 to 5 inches at point of placement.

B. Sidewalks and Curb Ramps: Minimum 28-day compressive strength of 4,000 psi, air content of 3 to 6 percent, slump of 3 to 5 inches at point of placement.

C. Curbs and Gutters: Minimum 28-day compressive strength of 4,000 psi, consistent with adjacent pavement requirements.

2.3 REINFORCEMENT AND JOINT MATERIALS

A. Reinforcing Steel: Where shown on the drawings, deformed steel bars conforming to ASTM A615, Grade 60, or welded wire reinforcement conforming to ASTM A1064.

B. Joint Filler: Preformed bituminous or non-bituminous joint filler for expansion joints, conforming to ASTM D1751 or D1752, as applicable.

C. Wood Joint Filler, where used in lieu of preformed filler: Clear heart redwood or finger-jointed redwood, with no splices. Minimum board length of 10 feet, except that boards for slab sections shorter than 10 feet shall be placed in one continuous length matching the slab section.

D. Joint Sealant: Per Section 32 13 73.

E. Curing Compound: Liquid membrane-forming compound, ASTM C309, Type 1 or Type 2 as applicable to finish requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade and aggregate base have been prepared and compacted in accordance with Section 31 20 00, and proof-rolled where required, before beginning paving operations.

B. Verify that utilities, conduits, and sleeves required beneath paving have been installed and inspected before placing concrete.

C. Subgrade and Base Correction:

1. Where formwork is not used, square off the edge of existing earth or pavement vertically at the limits of new paving, free of loose or protruding material.

2. The base shall be dry, smooth, and hand-graded where necessary to provide the full-depth thickness required by Part 1.1 or the drawings.

3. Where over-excavation is necessary to remove loose or soft base material, add and properly grade additional sand base to restore the required base thickness, at no additional cost to the Owner unless directed otherwise.

D. Immediately before placing concrete, uniformly moisten the subgrade, unless specifically waived by the Engineer.

3.2 FORMING

A. Set forms to required lines, grades, and elevations. Use sufficiently rigid forms to maintain shape and alignment during concrete placement.

B. Built-up forms are permitted, not exceeding 2 inches in height.

C. Split slab construction is permitted.

D. Clean and coat forms with form-release agent before placing reinforcement or concrete.

3.3 JOINTING

A. Construction Joints: Provide at the end of each day's placement, and at other locations as shown on the drawings, in accordance with ACI 301.

B. Contraction (Control) Joints: Saw-cut or tool joints at spacing as shown on the drawings, to a depth of not less than one-fourth the slab thickness. Complete saw-cutting within 12 hours of placement, or as required to control random cracking.

C. Isolation Joints: Provide at intersections of paving with structures, manholes, light pole bases, and other fixed objects, using joint filler specified in Part 2.3.

D. Expansion Joints: Provide at locations shown on the drawings, with joint filler and sealant in accordance with Section 32 13 73.

3.4 PLACING CONCRETE

A. Place concrete in accordance with ACI 301, on a moist, properly prepared subgrade or base. Do not place concrete on frozen or muddy subgrade.

B. Consolidate concrete using mechanical vibration, taking care to avoid segregation and over-vibration.

C. Screed and float concrete to required lines, grades, and cross-sections.

3.5 FINISHING

A. Hand finishing is permitted where mechanical finishing is not practicable.

B. Drives and Parking Areas: Broom finish, at the Contractor’s option, perpendicular to the direction of traffic, unless otherwise shown on the drawings. Where pavement is scheduled to receive a hot-mix asphalt overlay, score the finished surface to provide a bonding key for the overlay.

C. Sidewalks and Walkways: Broom finish, with edges and joints tooled.

D. Curb Ramps and Detectable Warning Areas: coordinating finish elevation and texture with Engineer.

3.6 CURING AND PROTECTION

A. Begin curing immediately after finishing, using the curing compound specified in Part 2.3, applied at the manufacturer's recommended rate, or an approved alternative curing method.

B. Protect concrete from premature drying, excessive heat, freezing, and physical damage for not less than 3 days, or until the specified strength is achieved.

C. Protect newly placed concrete from construction traffic until it has achieved sufficient strength.

D. Opening to Traffic: Do not open finished pavement to vehicular traffic until standard test specimens have attained the specified 28-day design compressive strength.

3.7 FIELD QUALITY CONTROL

A. Sample and test concrete during placement in accordance with ASTM C94 and the testing agency's standard procedures, including slump, air content, temperature, and compressive strength cylinders.

B. Test Frequency: Not less than one (1) set of compressive strength cylinders for each 50 cubic yards of concrete placed, or for each day's placement, whichever results in more frequent testing.

C. Notify Engineer not less than 24 hours before each of the following:

1. Commencement of forming and placement.
2. Saw-cutting of contraction joints.

D. Where test results indicate concrete does not meet specified strength, the Engineer may require additional testing, core sampling, or removal and replacement of the affected area, at no additional cost to the Owner.

3.8 REPAIR AND PROTECTION

A. Repair or replace paving showing cracking (other than at designated control joints), spalling, scaling, discoloration, or other defects, as directed by the Engineer.

B. Protect finished paving from damage until acceptance by the Owner. Repair damage caused by the Contractor's operations at no cost to the Owner.

END OF SECTION 32 13 13

SECTION 32 13 73
CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Joint sealants for contraction, construction, isolation, and expansion joints in concrete paving specified in Section 32 13 13.
2. Backer rod and bond-breaker materials.

B. Related Requirements:

1. Section 32 13 13 – Concrete Paving, for joint layout, joint filler, and concrete placement.

1.2 REFERENCES

A. ASTM C920 – Standard Specification for Elastomeric Joint Sealants.

B. ASTM D5249 – Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints.

C. ASTM D6690 – Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

D. Federal Specification SS-S-200 (or successor designation), for hot-applied joint sealants, where referenced by the sealant manufacturer.

1.3 SUBMITTALS

A. Product Data: For each sealant, primer, and backer rod material proposed for use, including manufacturer's installation instructions.

B. Sealant Manufacturer's Certification: Indicating that the proposed sealant is compatible with the joint filler and concrete specified in Section 32 13 13.

C. Color Samples: Where sealant color is a design consideration, submit manufacturer's standard color samples for selection.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Sealant shall be installed by an applicator with not less than 3 years of documented experience installing the specified sealant type in comparable applications.

B. Pre-installation Conference: Coordinate joint sealant installation review with the pre-installation conference held under Section 32 13 13, or conduct a separate conference if joint sealing will not immediately follow paving.

1.5 WARRANTY

A. Furnish a written warranty signed by the Installer and the sealant manufacturer, agreeing to repair or replace joint sealant that fails to achieve or maintain a watertight seal, or that exhibits adhesive or cohesive failure, within two (2) years from the date of Substantial Completion.

1.6 PROJECT CONDITIONS

A. Do not install sealant when ambient or joint surface temperature is below the sealant manufacturer's minimum recommended application temperature, or when joints are wet or contain frost.

B. Concrete shall have cured for not less than 28 days, or as otherwise recommended by the sealant manufacturer, before joint sealing, unless the manufacturer's product is specifically formulated for earlier application.

PART 2 - PRODUCTS

2.1 SEALANT MATERIALS

A. Cold-Applied (Self-Leveling) Sealant: Refer to LSSRB, 2016 or latest edition, - Section 1005 for use at joints in horizontal traffic-bearing surfaces.

B. Color: Gray, as selected by Engineer from manufacturer's standard colors, unless concealed or non-visible upon completion.

2.2 ACCESSORY MATERIALS

A. Backer Rod: Refer to LSSRB, 2016 or latest edition, - Section 1005.

B. Bond Breaker Tape: Polyethylene tape or other material recommended by the sealant manufacturer, where backer rod is not used or where additional bond-breaking is required.

C. Primer: As recommended by the sealant manufacturer for the substrate and joint conditions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that joints are clean, dry, sound, and free of loose material, laitance, curing compound residue, and other contaminants before beginning sealant installation.

B. Verify that joint width and depth are within the tolerances required for the specified sealant, and that backer rod can be installed to achieve the manufacturer's recommended sealant profile.

3.2 PREPARATION

A. Clean joints by sandblasting, wire brushing, water blasting, or other method recommended by the sealant manufacturer, removing all curing compound, laitance, and debris from joint faces.

B. Install backer rod or bond breaker tape at the depth required to achieve the specified sealant profile, taking care not to puncture or stretch the backer rod.

C. Apply primer to joint faces where required by the sealant manufacturer, allowing proper cure time before sealant application.

3.3 INSTALLATION

A. Cold-Applied Sealant: Mix (where multi-component) and apply in accordance with the manufacturer's instructions and LSSRB, 2016 or latest edition, - Section 1005, filling the joint to the depth required without overfilling.

B. Finish sealant surface flush with or slightly below adjacent pavement surface, to avoid creating a tripping hazard or a condition that retains debris.

C. Do not permit vehicular or pedestrian traffic on sealed joints until the sealant has cured sufficiently to resist damage, per the manufacturer's recommendations.

3.4 FIELD QUALITY CONTROL

A. Inspect completed sealant installation for proper depth, profile, adhesion, and absence of voids, bubbles, or other defects.

B. Repair or replace sealant that exhibits improper adhesion, voids, or other defects within the warranty period specified in Part 1.5, at no cost to the Owner.

3.5 PROTECTION

A. Protect newly installed sealant from damage by construction traffic, equipment, and other operations until fully cured.

END OF SECTION 32 13 73

SECTION 32 17 23
PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pavement markings for standard parking stalls, accessible parking stalls, and access aisles.
2. Directional arrows, stop bars, and crosswalk markings.
3. Fire lane markings and lettering, in accordance with the requirements of the authority having jurisdiction.
4. Curb painting, where shown on the drawings.
5. Street and roadway markings, including centerline, sideline (lane line), turn lane, and railroad crossing markings, where shown on the drawings.
6. Raised pavement markers (reflectors), where shown on the drawings.

B. Related Requirements:

1. Section 32 13 13 – Concrete Paving.

1.2 REFERENCES

A. ADA Standards for Accessible Design, for accessible parking space and access aisle dimensions, marking, and signage coordination.

B. Manual on Uniform Traffic Control Devices (MUTCD), for symbol, arrow, and legend design where applicable to public right-of-way or fire access markings.

C. Louisiana State Fire Marshal requirements for fire lane marking color, lettering, and spacing.

D. Tangipahoa Parish Government standards for pavement markings within public right-of-way, where applicable.

E. Louisiana DOTD Standard Specifications, Section 731 – Raised Pavement Markers, for material and installation requirements for reflectors.

F. Louisiana DOTD Standard Specifications, Section 732 – Plastic Pavement Markings, for material and installation requirements for thermoplastic markings, where thermoplastic is selected.

1.3 SUBMITTALS

A. Product Data: For traffic paint, thermoplastic, or preformed tape marking materials proposed for use, including manufacturer's application instructions and expected service life.

B. Striping and Marking Plan: Layout drawing showing location, dimensions, and color of all pavement markings, including standard stalls, accessible stalls and

access aisles, fire lanes, directional arrows, stop bars, and crosswalks, coordinated with the parking bumper layout under Section 32 17 13.

C. Color Samples: Manufacturer's standard color samples for selection where color is not otherwise specified by code or the authority having jurisdiction.

1.4 QUALITY ASSURANCE

A. Accessible parking space markings, dimensions, and signage shall comply with the ADA Standards for Accessible Design and applicable Louisiana accessibility requirements.

B. Fire lane markings shall comply with the requirements of LA State Fire Marshal, including marking color, lettering content and size, and spacing of lettering along the curb or pavement edge.

C. Pre-installation Conference: Conduct a conference at the project site prior to start of pavement marking. Review the approved striping and marking plan, layout verification method, and marking material application requirements.

1.5 PROJECT CONDITIONS

A. Do not apply pavement marking materials until paving specified in Section 32 13 13 has cured for the minimum period recommended by the marking material manufacturer, typically not less than 28 days for new concrete unless the manufacturer's product is specifically formulated for earlier application.

B. Do not apply markings when pavement surface is wet, contaminated, or when ambient or surface temperature is below the manufacturer's minimum recommended application temperature.

PART 2 - PRODUCTS

2.1 MARKING MATERIALS

A. Traffic Paint: Waterborne or solvent-based traffic marking paint, formulated for the substrate (concrete), conforming to applicable state or federal specifications for traffic paint.

B. Preformed Marking Tape (Temporary): Where specified, durable preformed pavement marking tape, suitable for the substrate and anticipated traffic.

2.2 RAISED PAVEMENT MARKERS

A. Raised pavement markers (reflectors): Conforming to Louisiana DOTD Standard Specifications (2016, or latest edition), Section 731, of the type and reflectivity (white, yellow, or red/amber as applicable to the marking they supplement) shown on the drawings.

B. Adhesive: As recommended by the marker manufacturer for the pavement substrate, conforming to Louisiana DOTD Standard Specifications (2016, or latest edition), Section 731.

2.3 COLORS

A. Standard Parking Stalls: White, unless otherwise shown on the drawings or required by local code.

B. Accessible Parking Stalls and Access Aisles: Blue, with white border, in accordance with ADA Standards and applicable state requirements.

C. Fire Lanes: Red, with white lettering reading "FIRE LANE – NO PARKING" or as required by the authority having jurisdiction.

D. Stop Bars, Crosswalks, and Directional Arrows: White, unless otherwise required by the authority having jurisdiction.

E. Curb Painting, where shown on the drawings: Yellow / Red, as applicable to fire lane or no-parking designation.

F. Centerline Striping: Yellow, unless otherwise required by the authority having jurisdiction or shown on the drawings.

G. Sideline (Lane Line) Striping: White for the right-hand edge or two-way roadway edges; yellow for the left-hand edge of one-way roadways, unless otherwise shown on the drawings.

2.4 STREET AND ROADWAY MARKING SCHEDULE

A. The following dimensions and configurations apply to street and roadway markings shown on the drawings, except where the drawings or details indicate otherwise, in which case the drawings and details govern:

1. Centerline Striping: 5-foot stripe on 15-foot centers.
2. Sideline Striping, two-way traffic: continuous white.
3. Sideline Striping, one-way traffic: continuous yellow at the left, continuous white at the right.
4. Stop Bar: 12 feet long by 12 inches wide, white.
5. Directional Arrow, one-way only: 6 feet long, white.
6. Pedestrian Crosswalk: 18 inches wide by 5 feet long bars, white, spaced per the drawings and details.

B. Conflicts between this schedule and the drawings or details shall be resolved by following the drawings and details, unless otherwise directed by the Engineer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that paving is clean, dry, free of curing compound residue, dirt, and other contaminants that would impair marking adhesion, before beginning layout or application.

B. Verify that parking bumpers under Section 32 17 13 have been set before finalizing stall striping layout, where bumper location affects stall dimensions.

3.2 LAYOUT

A. Lay out markings in accordance with the approved striping and marking plan, using chalk lines, string lines, or other temporary layout method that does not damage or permanently mark the pavement surface.

B. Verify accessible parking space and access aisle dimensions and location against the approved plan and applicable code requirements before applying permanent markings.

C. Verify fire lane marking layout, including lettering spacing and content, against the requirements of the authority having jurisdiction before application.

3.3 APPLICATION

A. Apply marking materials in accordance with the manufacturer's instructions, at the manufacturer's recommended film thickness and coverage rate.

B. Apply markings in a minimum of 2 coats where required to achieve specified opacity and durability, allowing proper drying time between coats.

C. Provide clean, sharp edges on all markings. Remove or correct markings that are misaligned, smeared, or otherwise do not meet the approved layout.

D. Raised Pavement Markers: Install in accordance with the manufacturer's instructions and conforming to Louisiana DOTD Standard Specifications (2016, or latest edition), Section 731, at the locations and spacing shown on the drawings or specified in Part 2.4 of this Section. Clean and dry the pavement surface immediately before applying adhesive.

3.4 PROTECTION

A. Protect newly applied markings from vehicular and pedestrian traffic until fully cured, using barricades, cones, or other approved method.

B. Provide temporary signage or barricades as needed to maintain safe traffic flow during marking operations, in coordination with the Owner.

3.5 FIELD QUALITY CONTROL

A. Inspect completed markings for proper location, dimension, color, and adhesion, in accordance with the approved striping and marking plan.

B. Repair or reapply markings that do not meet specified requirements, at no cost to the Owner.

END OF SECTION 32 17 23

DIVISION 33

UTILITIES

SECTION 33 05 00
COMMON WORK RESULTS FOR UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Common requirements for excavation, trenching, bedding, and backfill specific to utility installation, supplementing Section 31 20 00.
2. Common requirements for utility identification, including marking tape, tracer wire, and signage.
3. Common requirements for utility structures (manholes, valve boxes, vaults), where not otherwise specified in individual piping Sections.
4. Common requirements for connections to existing utilities and utility owner coordination.
5. Common requirements for testing, disinfection, and closeout documentation applicable across utility types.
6. Pipe-laying sequencing, subsurface obstruction protocol, survey monument restoration, and pavement cutting and restoration procedures specific to utility trenching.

B. This Section applies to all Division 33 Sections on the project, except where a specific Section states otherwise. Where a conflict exists between this Section and a specific piping or equipment Section, the more stringent requirement governs, unless the specific Section explicitly supersedes this Section.

C. This Section does not include general excavation, fill, and backfill compaction requirements, which are specified in Section 31 20 00.

D. Related Requirements:

1. Section 31 10 00 – Site Clearing.
2. Section 31 20 00 – Earth Moving, for general excavation, bedding, and backfill requirements.
3. Section 33 11 00 – Water Distribution Piping, where issued as a separate section.
4. Section 33 14 15 – Site Water Utility Valves.
5. Section 33 42 00 – Stormwater Conveyance.

1.2 REFERENCES

A. ASTM A746 – Standard Specification for Ductile Iron Gravity Sewer Pipe.

B. AWWA C600 – Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.

C. AWWA C651 – Standard for Disinfecting Water Mains.

D. ASTM D2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping.

E. OSHA 29 CFR 1926, Subpart P – Excavations.

F. Louisiana Department of Health, Office of Public Health – LAC 51:XII (State Sanitary Code, Water Supplies), for separation requirements between water and sewer/storm utilities and for water main disinfection and bacteriological testing.

1.3 DEFINITIONS

A. Utility Owner: The entity that will own and operate a given utility upon completion and acceptance, whether the Project Owner, a municipal or parish utility, or another entity, as applicable to each utility type.

B. Tracer Wire: Continuous insulated copper wire installed with non-metallic utility piping to allow future electronic location of the utility.

C. Horizontal and Vertical Separation: The minimum clear distance required between utilities of different types, as specified in Part 1.6, to protect water quality and allow maintenance access.

1.4 SUBMITTALS

A. Shop Drawings: For utility structures (manholes, vaults, valve boxes) not fully detailed on the drawings, and for any proposed substitution of materials or methods from those specified in the individual piping Sections.

B. Record Documents: Survey-grade horizontal and vertical location of all installed utilities, structures, and appurtenances, referenced to the project survey datum, submitted as part of project closeout.

C. Test Reports: Pressure testing, leakage testing, disinfection, and bacteriological testing results, as required by the applicable piping Section and this Section.

D. Connection Permits: Copies of permits or approvals from the applicable utility owner for connections to existing utilities, prior to making such connections.

1.5 QUALITY ASSURANCE

A. Utility Owner Coordination: Coordinate all connections to, modifications of, or work affecting existing utilities with the applicable utility owner. Obtain required permits and approvals before beginning work.

B. Independent Testing: Work under this and other Division 33 Sections will be field tested by an independent testing laboratory. Costs for retesting work that fails to meet specified requirements, and costs incurred to rectify deficient work, shall be borne by the Contractor.

C. Pre-installation Conference: Conduct a conference at the project site prior to start of utility installation. Review trenching and separation requirements, identification requirements, connection procedures, and testing requirements applicable across all utility types on the project.

1.6 PROJECT CONDITIONS

A. Utility Locates: Contractor shall arrange for utility locates (Louisiana One Call / 811) not less than 3 full working days prior to start of excavation for any utility installation, per Section 31 20 00.

B. Existing Utilities to Remain in Service: Maintain continuity of service for existing utilities designated to remain, except during approved, scheduled outages coordinated with the utility owner and, where applicable, the Owner's facility operations staff.

C. Minimum Separation Requirements:

1. Horizontal Separation: Provide not less than 6 feet horizontal separation between water mains and any existing or proposed gravity sanitary sewer or storm sewer, measured edge to edge, in accordance with LAC 51:XII §247.

2. Sanitary sewer force mains require the same minimum 6-foot horizontal separation from water mains, measured edge to edge, per LAC 51:XII §247.D.

3. Water piping shall not pass through or contact any part of a sanitary sewer manhole, and shall be located not less than 6 feet from sanitary sewer manholes, per LAC 51:XII §247.E.

4. Vertical Separation: Where water mains cross sanitary or storm sewers, provide not less than 18 inches vertical separation between the outside of the water main and the outside of the sewer, with the water main located above the sewer where practicable, in accordance with LAC 51:XII §247.B. At each crossing, center one full length of water pipe over the sewer so that both water pipe joints are as far from the sewer as possible.

5. Where minimum separation cannot be achieved, provide the alternative construction (such as pressure-rated pipe, encasement, or relocation) required by LAC 51:XII and approved by LDH-OPH before proceeding.

D. Subsurface Obstructions:

1. Determine the exact location of pipes, conduits, wires, mains, footings, and other underground structures and obstructions to be encountered in trenching or excavating, in addition to the utility locate requirements above.

2. Adequately protect subsurface obstructions from damage or displacement during trenching operations.

E. Pipe-Laying Sequencing:

1. Limit the length of trench excavated ahead of pipe-laying to that needed for one day’s pipe-laying operation, unless otherwise approved by the Engineer.

2. For gravity-flow piping, sequence pipe-laying to commence at the downstream end, outfall, or at a junction box or catch basin.

3. For pressure piping, sequence pipe-laying to conclude at the point of connection to the pressure source (such as a pressure main). Provide flushing

valves or other suitable means to prevent contamination of existing appurtenances at the connection.

F. Unsuitable Material Below Trench Grade:

1. Where material unsuitable for proper foundation is encountered at trench grade, remove it for the full width of the trench and to the depth required to reach suitable material, and replace with approved material, compacted and shaped to form the utility bed.
2. Except as provided below, the cost of removing and replacing unsuitable material encountered at trench grade is borne by the Owner.
3. Where a trench is left open, improperly backfilled, or otherwise exposed to surface runoff as a result of the Contractor's operations, and unsuitable material results from that exposure, the cost of removing and replacing that material is borne by the Contractor.

PART 2 - PRODUCTS

2.1 TRENCH BACKFILL AND BEDDING

A. Per Section 31 20 00, except as modified by the individual piping Section for bedding material specific to the pipe type being installed.

2.2 IDENTIFICATION MATERIALS

A. Underground Warning Tape: Detectable, color-coded polyethylene tape, installed continuously 24 inches above each buried utility, color-coded as follows: blue for potable water, green for sanitary sewer, unless otherwise required by the utility owner.

B. Tracer Wire: For non-metallic pressure piping (water mains and services), continuous No. 12 AWG, insulated soil copper tracer wire, installed along the top of the pipe, with access points (terminal boxes or valve box extensions) at intervals not exceeding 500 feet and at each valve, fitting, and dead end.

C. Structure Identification: Mark manhole and valve box covers with the utility type (e.g., "WATER," "STORM") by casting or stamping, where not already provided by the manufacturer's standard product.

2.3 UTILITY STRUCTURES, GENERAL

A. Precast Concrete Structures: ASTM C478, unless a specific structure type is otherwise specified in the applicable piping Section.

B. Frames and Covers: Cast iron or ductile iron, rated for the anticipated traffic loading (pedestrian or vehicular) at each structure location, with the utility type cast into the cover.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utility locates and field verification have been completed in accordance with Section 31 20 00 before beginning excavation for any utility.

B. Verify that minimum horizontal and vertical separation requirements per Part 1.6.C can be achieved based on the utility layout shown on the drawings. Notify the Engineer before proceeding if field conditions will not allow the required separation.

3.2 TRENCHING AND BACKFILL

A. Excavate, bed, and backfill utility trenches in accordance with Section 31 20 00, except where the individual piping Section specifies bedding or backfill requirements specific to that pipe type.

B. Trench Excavation, General: Excavate to the line and grade shown on the drawings or as directed by the Engineer. Where excavation is carried below or beyond that required, fill the resulting space with selected soil, properly compacted, or with concrete as directed by the Engineer, at no additional cost to the Owner.

3.3 PAVEMENT CUTTING AND RESTORATION

A. Cutting: Saw-cut pavement ahead of excavation to leave a uniform edge with minimum disturbance of remaining pavement. Do not mix pavement fragments 6 inches or larger with other excavated material; remove such fragments from the site before the remainder of the excavation is made.

B. Temporary Restoration:

1. Upon completion of backfill, apply temporary surfacing to cut or damaged pavement areas, maintained so that ruts and holes are promptly patched, until final pavement restoration is complete.

2. Do not begin final restoration sooner than 14 days after temporary surfacing is placed, to allow for trench settlement, unless otherwise directed by the Engineer.

C. Final Restoration: After the waiting period above, cut back the existing pavement not less than 1 foot beyond the limits of the original cut or beyond each edge of the trench, whichever is greater, and reconstruct the base and surface courses to match the existing adjacent pavement in every respect, including materials, thickness, and finished grade, unless otherwise shown on the drawings.

3.4 IDENTIFICATION

A. Install underground warning tape and tracer wire, where applicable to the utility type, per Part 2.2 of this Section, as backfill is placed.

B. Test continuity of tracer wire systems before final acceptance, and repair or replace any discontinuity found.

3.5 CONNECTIONS TO EXISTING UTILITIES

A. Make connections to existing utilities only after obtaining required permits and coordinating shutdown or tie-in scheduling with the applicable utility owner.

B. Notify the Engineer and, where applicable, the Owner's facility operations staff not less than 72 hours before any connection that will interrupt service to an existing utility.

C. Restore service promptly upon completion of the connection, and verify proper operation before leaving the site.

3.6 FIELD QUALITY CONTROL

A. Perform testing applicable to each utility type as specified in the individual piping Section (33 11 00, 33 14 15, 33 42 00, or others), in addition to the identification and separation verification required by this Section.

B. Survey the horizontal and vertical location of all installed utilities, structures, and appurtenances before backfilling is completed over each segment, for inclusion in record documents.

3.7 TREE AND LANDSCAPE PROTECTION DURING TRENCHING

A. Protect trees adjacent to trenching operations from damage due to equipment operation, material storage, or excavation. Where trenching occurs within the dripline of a tree to remain, hand-excavate or use other methods that minimize root damage.

B. Cut tree branches or roots only with the Engineer’s permission. Make cuts smoothly and neatly without splitting or crushing, and treat damaged or cut portions with an appropriate wound dressing.

C. Protect cultivated hedges, shrubs, plants, and lawns that may be affected by trenching operations, or temporarily relocate and maintain them, replanting in their original positions after construction operations are substantially complete.

D. Where excavation occurs in grassed areas, remove and store sod and topsoil that may be damaged for reinstallation. After backfilling and compacting the trench, restore topsoil to a minimum 4-inch layer, and replace original sod where suitable for reuse, or with comparable sod where it is not, restoring the area to original line and grade.

3.8 CLOSEOUT

A. Submit record documents per Part 1.4 of this Section upon completion of utility installation.

B. Provide the Owner with operation and maintenance information for valves, structures, and appurtenances furnished under Division 33, coordinated with the requirements of the individual piping Sections.

END OF SECTION 33 05 00

SECTION 33 10 00
WATER UTILITIES

PART 1 – GENERAL

1.1 SUMMARY

A. This Section specifies materials and procedures for construction of underground water distribution piping for domestic and/or fire supply systems outside the building, complete and ready for operation, including piping, structures, appurtenances, and all other incidentals.

1.2 RELATED SECTIONS

A. Section 31 20 00 – Earth Moving: excavation, trench widths, pipe bedding, backfill, shoring, sheeting, and bracing.

B. Section 33 14 15 – Water Utility Valves: valves, hydrants, meters, and service connections.

1.3 DEFINITIONS

A. Water Distribution System: pipelines and appurtenances outside the building that are part of the potable water and fire supply distribution system.

B. Water Service Line: the pipeline from the main line to five feet outside the building, or to the point designated by the Owner.

1.4 SUBMITTALS

A. Product data for pipe, fittings, valves, hydrants, and appurtenances.

B. Shop drawings showing layout, sizes, materials, thrust restraint, and connection details to existing water mains.

C. Certification that materials in contact with potable water conform to NSF/ANSI Standard 61 (and NSF/ANSI 372 for lead-free content, per the Reduction of Lead in Drinking Water Act).

1.5 DELIVERY, STORAGE, AND HANDLING

A. Valves shall be delivered dry and internally protected against rust and corrosion, with threaded ends protected against damage.

B. Pipe shall be handled to prevent damage to interior linings and exterior coatings; store on level ground with dunnage to prevent contact with the ground.

PART 2 – PRODUCTS

2.1 PIPE AND FITTINGS

A. Ductile Iron Pipe: AWWA C151, with mechanical or push-on joints conforming to AWWA C111. Minimum thickness Class PC350.

B. PVC Pipe (4-inch to 12-inch diameter): AWWA C900, Class 200 (SDR 18), cast-iron outside diameter, with elastomeric gaskets conforming to ASTM F477 providing a watertight seal per ASTM D3139. Contractor to verify existing pipe O.D. (CIOD vs. DIPS)

C. Fittings on PVC pipe shall be mechanical-joint ductile iron fittings unless otherwise indicated.

2.2 VALVES AND HYDRANTS

A. Gate valves, resilient-seated, conforming to AWWA C509 or C515, rated bubble-tight at 200 psi minimum.

B. Fire hydrants conforming to AWWA C502, with National Standard hose threads unless otherwise required by the local fire authority.

2.3 LOCATOR WIRE

A. Provide 12 AWG solid copper locator wire, PVC insulated, type UF, UL listed for direct burial, installed continuously without splicing along the pipe on all non-metallic utility installations.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install piping to the lines and grades indicated, with minimum cover as required by the local jurisdiction and AWWA M41 guidance for the pipe material used.

B. Provide thrust restraint (thrust blocks or restrained joints) at all bends, tees, plugs, and hydrant branches.

3.2 DISINFECTION AND TESTING

A. Disinfect new water mains in accordance with AWWA C651. Flush and disinfect until two consecutive bacteriological samples, taken 24 hours apart, are satisfactory.

B. Pressure test new water mains in accordance with AWWA C600 or C605 for PVC prior to acceptance.

END OF SECTION 33 10 00

SECTION 33 11 00
WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Water main and water service line pipe, fittings, and joints, for the new site water distribution system.
2. Pipe-laying, including sequencing, alignment, and protection of pipe and fittings before and during installation.
3. Joint restraint for fittings and bends in the water distribution system.
4. Service connections, including connection to existing water lines and relocation of existing service connections affected by the work.
5. Hydrostatic testing and disinfection of new water mains and service lines.
6. Boring and jacking of water pipe, where shown on the drawings or required to cross roadways or other obstructions without open-cut excavation.

B. This Section does not include:

1. Valves, valve boxes, valve vaults, and fire hydrants, specified in Section 33 14 15.
2. General trenching, bedding, backfill, and identification requirements common to all utilities, specified in Section 33 05 00 and Section 31 20 00.

C. Related Requirements:

1. Section 31 20 00 – Earth Moving, for general excavation, bedding, and backfill requirements.
2. Section 33 05 00 – Common Work Results for Utilities, for trenching, identification, and separation requirements common to this Section.
3. Section 33 14 15 – Site Water Utility Valves, for valves, valve boxes, and fire hydrants connected to the piping specified in this Section.

1.2 REFERENCES

A. AWWA C900 – Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In., for Water Transmission and Distribution.

B. ASTM D1785 – Standard Specification for Poly(Vinyl Chloride) (PVC) Plastics Pipe, Schedules 40, 80, and 120, for PVC pipe smaller than 4 inches in diameter.

C. ANSI/AWWA C151/A21.51 – Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.

D. AWWA C153/A21.53 – Standard for Ductile-Iron Compact Fittings.

E. ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials, for polyethylene pipe used in boring and jacking applications.

F. AWWA C600 – Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.

G. AWWA C605 – Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water

H. AWWA C651 – Standard for Disinfecting Water Mains.

I. NSF/ANSI 61 – Drinking Water System Components – Health Effects, for all pipe, fittings, and joint materials in contact with potable water.

J. Louisiana Department of Health, Office of Public Health – LAC 51:XII (State Sanitary Code, Water Supplies), for separation requirements, disinfection, and bacteriological testing of new water mains.

1.3 SUBMITTALS

A. Product Data: For each type of pipe, fitting, and joint material proposed for use, including manufacturer's catalog data and pressure rating.

B. Material Certificates: NSF/ANSI 61 certification for all pipe, fittings, and joint materials in contact with potable water.

C. Shop Drawings: Pipe layout and profile, showing pipe size, material, class, joint type, and fitting locations, coordinated with the valve and hydrant layout under Section 33 14 15.

D. Restrained Joint Design: Calculations or manufacturer's data substantiating the restrained joint lengths proposed at each bend, tee, and dead end, based on the project's design test pressure and soil bearing conditions.

E. Hydrostatic Test Reports: For each test section, including test pressure, duration, and measured leakage, compared to the allowable leakage specified in Part 3.6 of this Section.

F. Disinfection and Bacteriological Test Reports: In accordance with AWWA C651 and LAC 51:XII, submitted before the new water main is placed into service.

1.4 QUALITY ASSURANCE

A. All pipe, fittings, and accessories shall be new and shall conform to the applicable ASTM, AWWA, and ANSI standards referenced in this Section.

B. Where the completed water system, or any portion of it, will be dedicated to or operated by North Oaks Health, pipe, fittings, and joint materials shall be selected from that utility owner's approved products list, and installation shall comply with that utility owner's standard specifications and details, in addition to the requirements of this Section, if applicable.

C. Pre-installation Conference: Coordinate water distribution piping installation review with the pre-installation conference held under Section 33 05 00. Review

pipe handling, joint restraint design, pipe-laying sequencing, service connection procedures, and hydrostatic testing requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Handle all pipe and accessories with care to ensure a sound, undamaged condition upon delivery and installation. Take particular care to avoid damage to pipe coatings and linings.

B. Store pipe and accessories in accordance with the manufacturer's recommendations, off the ground, and protected from damage.

C. Handle pipe in conformance with AWWA Manual M23 (PVC pipe) or AWWA C600 (ductile iron pipe), as applicable to the pipe material.

PART 2 - PRODUCTS

2.1 PIPE MATERIALS

A. Water main and service line pipe shall be one of the following, as shown on the drawings or approved by the Engineer:

1. PVC Pipe: AWWA C900, DR 18, for pipe 4 inches in diameter and larger; or ASTM D1785, Schedule 40, for pipe smaller than 4 inches in diameter.

2. Ductile Iron Pipe: ANSI/AWWA C151/A21.51, Class PC350, with mechanical joints unless otherwise shown on the drawings.

B. Boring and Jacking Pipe: Where pipe is installed by boring or jacking without a casing pipe, polyethylene pipe (PE 3408), SDR 11, conforming to ASTM D3350, cell classification 345434C.

2.2 FITTINGS AND JOINT MATERIALS

A. Fittings: Ductile iron, AWWA C153/A21.53, with mechanical joint, push-on joint, or flanged ends as shown on the drawings or required by the connecting pipe and appurtenances.

B. Joint Restraint: Mechanical joint restraint glands, or other restrained joint system compatible with the pipe and fitting materials specified, sized in accordance with the restrained joint design required by Part 1.4 of this Section.

C. Tracer Wire: 12 AWG solid copper wire with PVC insulated, as specified in Section 33 05 00, approved by the Engineer.

2.3 CONCRETE

A. Concrete for thrust blocking, valve box foundations, and similar appurtenances under this Section: minimum 3,000 psi compressive strength at 28 days, unless a higher strength is required elsewhere in the Contract Documents.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that trenching and bedding under Section 33 05 00 and Section 31 20 00 are complete and meet the requirements of those Sections before beginning pipe-laying.

B. Verify pipe, fittings, and joint materials for damage before installation. Do not install pipe or fittings showing cracks, gouges, or other defects that could affect performance.

3.2 PIPE-LAYING, GENERAL

A. Limit the length of trench excavated ahead of pipe-laying to that needed for one day's pipe-laying operation, unless otherwise approved by the Engineer, per Section 33 05 00.

B. Lay pipe true to line and grade, with the bottom of the trench graded to provide uniform bearing and support for each section of pipe along its entire length on undisturbed or properly bedded soil. Take care not to excavate below the depths indicated; backfill unauthorized over-depth excavation with material satisfactory to the Engineer, thoroughly compacted, at no additional cost to the Owner.

C. Provide a minimum cover of 2.5 feet over the top of the pipe from finished ground surface, and not less than 2.0 feet of cover at ditch and drainage channel crossings, unless otherwise shown on the drawings.

D. Keep the interior of the pipe clean before lowering into the trench, and maintain it free of water, soil, and other foreign matter that might obstruct valves, regulators, or other equipment. Close all pipe openings by suitable means at all times except as the progress of the work requires. Close stub ends and fittings installed for future connection with plugs or caps.

E. Excavate bell or coupling holes in the trench bottom to allow the entire length of the pipe barrel to bear on the bedding, unless otherwise recommended by the pipe manufacturer.

F. Cut pipe, where necessary, in a neat and workmanlike manner without damage to the pipe.

G. Where PVC pipe connects to metal fittings, apply thread lubricant to all threads before assembly, in accordance with the manufacturer's recommendations. Do not use pipe joint solvent or cement on threaded connections.

H. Install tracer wire directly over and along the centerline of all non-metallic pipe for its entire length, connected to all fixtures and appurtenances, in accordance with Section 33 05 00 and the tracer wire and pipe manufacturers' recommendations.

3.3 JOINT RESTRAINT

A. Restrain joints at bends, tees, crosses, reducers, caps, plugs, and other fittings subject to thrust, in accordance with the restrained joint design submitted under Part 1.4 of this Section.

B. Securely brace all bends, reducers, tees, crosses, wyes, caps, plugs, and similar fittings liable to move under thrust, to prevent joint separation.

C. Where connections are made between new work and existing mains, use special fittings suited to the actual field conditions encountered.

3.4 SERVICE CONNECTIONS

A. Before construction, locate all existing service connections to lines affected by the work. After installation of new water mains, reconnect all service connections to the new line. Additional service connections not shown on the drawings may be encountered; reconnect these as well, as directed by the Engineer.

B. Service assemblies shall consist of curb valve tees and all fittings and appurtenances required for a complete connection.

C. Service tie-ins and service line pipe shall conform to the pipe material specifications of this Section applicable to the type of main being tapped.

3.5 BORING AND JACKING

A. Where shown on the drawings or approved by the Engineer, install water pipe beneath roadways or other obstructions by boring or jacking, using the pipe specified in Part 2.1.B, installed by a boring machine and auger, hydraulic jack, or other approved method.

B. Repair, at no additional cost to the Owner, any injury or damage to pavement resulting from boring and jacking operations, including cracking or other disturbance to pavement on either side of the pipe line resulting from the Contractor's operations.

3.6 HYDROSTATIC TESTING

A. Test all pipelines to demonstrate they will withstand 150 psi operating pressure without leakage in excess of the allowable leakage specified below, in any test section.

B. Test each section for a minimum of 2 hours before backfilling pipe joints, or for 6 hours if the majority of pipe joints are already covered. Furnish all equipment, materials, and labor required to perform the tests and to replace defective items.

C. Test pipelines before backfilling pipe joints wherever conditions permit. Examine all uncovered joints during testing and stop all visible leaks. Remake and retest joints that leak until satisfactory.

D. Water used for testing shall be reasonably clean and free of oil, silt, mud, sticks, vegetable matter, and other objectionable material, furnished by the Contractor, including temporary pumping equipment and piping as required.

E. Furnish the test pump, pressure gauge, and an approved means of accurately measuring water introduced into the line during each test. Provide temporary plugs, bulkheads, pipe bracing, anchorages, and other items required for the test. Where required for safety, place sufficient backfill over the pipeline during testing. Remove and replace pipe, joints, fittings, valves, and other items damaged as a

result of excessive test pressure, inadequate bracing, improper test procedure, or other test-related causes. Do not use air to develop test pressure under any circumstances.

F. Before testing, furnish and install corporation stops at high points on the pipeline for expelling air, except at high points where air valves are shown on the drawings. Furnish and install one corporation stop for each test pump location.

G. Test length on the water distribution system shall not exceed 1,000 feet per test section.

H. Allowable Leakage: Per AWWA C605

I. Pipe, joints, fittings, valves, hydrants, and other items found cracked, leaking, or otherwise defective during testing shall be removed and replaced, and the affected pipeline retested until the test requirements are met.

3.7 DISINFECTION

A. Disinfect all new water mains and service lines in accordance with AWWA C651 before placing into service.

B. Submit bacteriological test results from an LDH-OPH-certified laboratory, with satisfactory results, before the new water main is placed into service, in accordance with LAC 51:XII.

3.8 FIELD QUALITY CONTROL

A. Notify the Engineer not less than 24 hours before each of the following:

1. Commencement of pipe-laying for each section.
2. Hydrostatic testing of each test section.
3. Connection to existing water mains.

B. Coordinate hydrostatic testing, disinfection, and bacteriological testing schedules with Section 33 14 15 for valve and hydrant flushing and testing.

3.9 CLOSEOUT

A. Record the final horizontal and vertical location, size, material, and class of all installed pipe, fittings, and joint restraint, for inclusion in the record documents required by Section 33 05 00.

END OF SECTION 33 11 00

SECTION 33 14 15
SITE WATER UTILITY VALVES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Gate valves for water distribution piping.
2. Valve boxes, valve vaults, and valve markers.

B. This Section does not include:

1. Water main and service line pipe, fittings, and joints, specified in Section 33 11 00.

C. Related Requirements:

1. Section 33 05 00 – Common Work Results for Utilities, for trenching, identification, and separation requirements common to this Section.
2. Section 33 11 00 – Water Distribution Piping, for pipe, fittings, and joint materials.

1.2 REFERENCES

A. AWWA C509 – Standard for Resilient-Seated Gate Valves for Water Supply Service.

B. AWWA C515 – Standard for Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service.

C. AWWA C504 – Standard for Rubber-Seated Butterfly Valves.

D. AWWA C508 – Standard for Swing-Check Valves for Waterworks Service.

E. AWWA C512 – Standard for Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service.

F. AWWA C502 – Standard for Dry-Barrel Fire Hydrants.

G. AWWA C600 – Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.

H. NSF/ANSI 61 – Drinking Water System Components – Health Effects, for all valves and appurtenances in contact with potable water.

1.3 SUBMITTALS

A. Product Data: For each type of valve, valve box, and fire hydrant proposed for use, including manufacturer's catalog data, dimensions, and pressure rating.

B. Shop Drawings: Valve and hydrant layout, coordinated with the water main alignment shown in Section 33 11 00.

C. Material Certificates: NSF/ANSI 61 certification for all valves, hydrants, and appurtenances in contact with potable water.

D. Operation and Maintenance Data: Manufacturer's operation and maintenance instructions for valves and hydrants, including valve operating nut dimensions and turning direction, for inclusion in the project closeout documents.

1.4 QUALITY ASSURANCE

A. Where the completed water system, or any portion of it, will be dedicated to or operated by North Oaks Health, valves, hydrants, and appurtenances shall be selected from that utility owner's approved products list, if applicable, and installation shall comply with that utility owner's standard specifications and details, in addition to the requirements of this Section.

B. Pre-installation Conference: Coordinate valve and hydrant installation review with the pre-installation conference held under Section 33 05 00.

PART 2 - PRODUCTS

2.1 GATE VALVES

A. Resilient-Seated Gate Valves: AWWA C509 or C515, ductile iron body, non-rising stem, mechanical joint or flanged ends as shown on the drawings, rated for not less than 200 psi working pressure, opening counterclockwise unless otherwise required by the utility owner.

B. Operating Nut: 2-inch square AWWA standard operating nut, unless otherwise required by the utility owner.

2.2 FIRE HYDRANTS

A. AWWA C502, dry-barrel type, with two 2½-inch hose nozzles and one 4½-inch pumper nozzle, national standard threads unless otherwise required by the local fire department, with a traffic-resistant breakaway flange.

B. Color: Red, with NFPA GPM Color Scheme.

C. Provide an isolation gate valve at each hydrant lead, per Part 2.1 of this Section.

2.3 VALVE BOXES AND MARKERS

A. Valve Boxes: Cast iron, two- or three-piece adjustable screw-type, heavy roadway type, with a minimum inside diameter of 5 inches, sized for the valve and depth of bury, with cover marked “WATER.”

B. Valve boxes shall be set with the top flush with finished grade and supported on an 18-inch square concrete foundation, except as otherwise shown on the drawings.

C. Valve boxes located within a secured or controlled-access area shown on the drawings shall have locking lids.

D. Valve Markers: Where required by the utility owner or shown on the drawings, post-type or pavement marker indicating valve location and offset.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that water main piping under Section 33 11 00 has been installed to the point of each valve or hydrant location, and that trench conditions meet the requirements of Section 33 05 00, before setting valves and hydrants.

3.2 INSTALLATION, GENERAL

A. Install valves, hydrants, and appurtenances in accordance with AWWA C600, the manufacturer's instructions, and the requirements of the water utility owner where applicable.

B. Support valves and hydrants independently of the connecting pipe, on a suitable base, to prevent settlement or misalignment.

C. Provide thrust restraint at valves, hydrants, and fittings in accordance with Section 33 11 00 and the project thrust restraint design.

3.3 VALVE BOX INSTALLATION

A. Set valve boxes plumb and centered over the valve operating nut, with the top of the box flush with finished grade or pavement surface, unless otherwise shown on the drawings.

B. Backfill around valve boxes with care to avoid displacement, and compact in accordance with Section 31 20 00.

3.4 FIRE HYDRANT INSTALLATION

A. Before setting, clean each hydrant completely free of dirt and other foreign matter.

B. Support each hydrant base on a solid concrete pad, minimum 18 inches square and 3,000 psi minimum compressive strength, set on firm, properly graded ground, as shown on the drawings.

C. Set hydrants solidly with concrete thrust blocks behind the barrel and behind the tee connection, to prevent movement of the pipe at the joints or of the hydrant.

D. Set fire hydrants plumb, with the lowest hose nozzle not less than 18 inches above finished grade, and the pumper nozzle facing the street or fire department access route as shown on the drawings or as directed by the authority having jurisdiction. Locate hydrants to minimize the risk of damage from vehicles or injury to pedestrians.

E. Provide a drainage gravel pocket at the hydrant base, consisting of not less than 7 cubic feet of clean gravel placed carefully around the hydrant base to allow drainage of the dry-barrel mechanism without displacing the hydrant or its connecting valve, in accordance with AWWA C600 and the hydrant manufacturer's instructions.

F. Provide a breakaway flange at or near finished grade in accordance with the manufacturer's instructions.

3.5 FIELD QUALITY CONTROL

A. Operate each valve through its full range to verify proper function before backfilling is completed.

B. Flush and test fire hydrants for proper operation and flow, coordinated with the disinfection and bacteriological testing of the water main under Section 33 11 00 and the requirements of LAC 51:XII.

C. Notify the Engineer and, where applicable, the water utility owner not less than 24 hours before testing of valves and hydrants.

3.6 CLOSEOUT

A. Record the location, size, type, and number of turns to open for each valve, and the location of each hydrant, for inclusion in the record documents required by Section 33 05 00.

B. Provide valve operating keys (T-handle wrenches) to the Owner, not less than two, or in the quantity shown on the drawings or specified by the water utility owner, whichever is greater.

END OF SECTION 33 14 15

SECTION 33 42 00
STORMWATER CONVEYANCE

PART 1 – GENERAL

1.1 SUMMARY

A. This Section generally includes exterior storm sewer piping, culverts, manholes, catch basins, area drains, trench drains, gratings, headwalls, flared end sections, riprap, and related appurtenances that convey stormwater from collection points to an approved discharge or detention/retention facility.

B. This Section also includes subsurface drainage systems for foundations, underslab areas, and pavement subgrades, including perimeter foundation drains and underdrains. Subdrainage piping connects to the stormwater conveyance system specified herein; it shall not be connected to the sanitary sewer system.

C. The Contractor shall, unless specified otherwise, furnish all materials, equipment, tools, and labor necessary to excavate, lay, test, backfill, and place in service the stormwater conveyance and subsurface drainage systems shown on the Drawings.

1.2 UNIT PRICES (where a unit-price contract is used)

A. Pipe culverts and storm drains, by linear foot, by size and material.

B. Storm drainage structures (manholes, catch basins, inlets), by each.

1.3 SUBMITTALS

A. Shop drawings for manholes and catch basins: base sections, riser sections, eccentric/concentric conical top sections, flat slab tops, grade rings, frames, and covers, with certification of compliance with ASTM C478.

B. Product data for pipe, fittings, gratings, frames, and precast structures, including manufacturer's certification of compliance with the referenced ASTM/AASHTO standards.

C. Product data for each type of drainage pipe, tubing, and geotextile fabric used in the subsurface drainage system.

D. Coordination drawings showing pipe sizes, locations, elevations, and clearances from other utilities in the same trench.

1.4 REGULATORY REQUIREMENTS

A. Comply with the state Department of Environmental Quality/Department of Health stormwater and drainage district requirements applicable to the project, and with any local drainage district or parish/county drainage ordinance.

PART 2 – PRODUCTS

2.1 GENERAL

A. Pipe and fittings for storm sewers and culverts shall be of the materials shown on the Drawings; where not shown, provide reinforced concrete pipe, HDPE, or PVC as approved by the Engineer.

B. Precast concrete manholes and catch basins shall conform to ASTM C478, jointed with rubber gasket sealing compound.

2.2 REINFORCED CONCRETE PIPE

A. Reinforced concrete sewer pipe and fittings: ASTM C76, class as required by the cover loading and bedding condition shown on the Drawings, with rubber-gasketed joints conforming to ASTM C443.

2.3 HDPE PIPE

A. Corrugated HDPE pipe with integrally formed smooth interior, conforming to AASHTO M294 (12-inch to 36-inch diameter) or AASHTO M252 with smooth interior liner (8-inch to 10-inch diameter); material conforming to AASHTO/ASTM D3350.

B. Joints shall be gasketed, watertight, using factory-installed watertight sleeves and gaskets.

2.4 SUBSURFACE DRAINAGE PIPE AND FITTINGS

A. PE drainage tubing and fittings: AASHTO M252, Type S, corrugated with smooth interior waterway, for coupled joints.

B. PVC sewer pipe and fittings: ASTM D3034, SDR 35, bell-and-spigot ends, with elastomeric gaskets conforming to ASTM F477.

2.5 STRUCTURES, GRATINGS, AND END SECTIONS

A. Precast concrete catch basins and area drains conforming to ASTM C478 (or C858, as applicable).

B. Gratings and frames for stormwater drainage inlets: cast iron or ductile iron, of the load rating (H-20, pedestrian, etc.) appropriate to the location.

C. Flared end sections and concrete/steel end sections sized to match the connecting pipe.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Excavate and backfill trenches per Section 31 20 00 – Earth Moving. Bed and encase pipe as specified therein.

B. Install piping to the lines and grades shown on the Drawings, bedded and backfilled per Section 31 20 00 – Earth Moving.

C. Install manholes and catch basins in accordance with Section 33 05 00 – Common Work Results for Utilities, with lid and frame set level in grout to the elevation indicated.

D. Where connecting to an existing manhole, core-drill to a clean opening (do not use pneumatic hammers or chipping tools), install a watertight neoprene gasket, and seal with non-shrink concrete grout.

E. Concrete-encase new pipe a minimum of 24 inches on each side of a connection to an existing structure, unless otherwise indicated.

F. Connect subsurface drainage piping to the stormwater conveyance system as indicated on the Drawings; do not connect subdrainage to the sanitary sewer system.

3.2 FIELD QUALITY CONTROL

A. Inspect pipe, fittings, and appurtenances for damage and defects prior to installation.

B. Test pipe joints and manhole connections for water-tightness prior to backfill, per the applicable ASTM standard for the pipe material used.

C. Deflection testing: test 100 percent of flexible pipe (HDPE, PVC, corrugated steel) not less than 30 days after backfilling is complete, using a rigid ball or mandrel with a diameter equal to 95 percent of the pipe's published inside diameter. Mechanical pulling units shall not be used.

D. Provide the results of deflection and other required testing to the Engineer and, where the line connects to a public storm sewer, to the applicable public works/drainage district authority.

END OF SECTION 33 42 00

DIVISION 34

TRANSPORTATION

DIVISION 40

PROCESS INTEGRATION

DIVISION 44

POLLUTION CONTROL EQUIPMENT