Lake Charles Event Center Green Rooms

#CP 3507

900 Lakeshore Drive
Lake Charles, Louisiana 70601

Construction Documents Specifications

Date: April 10, 2026
GHC Project #: 4024119

GRACE HEBERT CURTIS ARCHITECTS, LLC

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Owner:

City of Lake Charles
326 Pujo Street
Lake Charles, LA. 70601
p. 337.491.1481

Architect/Interior Design:

Grace Hebert Curtis Architects, LLC
501 Government Street, Suite 200
Baton Rouge, LA 70802
p. 225.338.5569

Mechanical Engineer

Grace Hebert Curtis Architects, LLC
501 Government Street, Suite 200
Baton Rouge, LA 70802
p. 225.338.5569

Electrical Engineer

Parish Engineering
7600 Innovation Park Drive
Baton Rouge, LA 70820
p. 225.332.0222

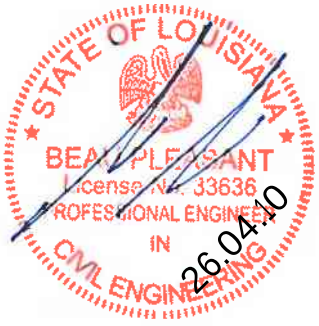
Structural Engineer

Duhon & Pleasant Consulting Engineers, LLC
5393 Big Lake Road
Lake Charles, LA 70605
p. 337.564.5918

Civil Engineer

Duhon & Pleasant Consulting Engineers, LLC
5393 Big Lake Road
Lake Charles, LA 70605
p. 337.564.5918

SECTION 00 0003 – PROFESSIONAL SEALS

 ARCHITECT – GRACE HEBERT CURTIS ARCHITECTS, LLC	 ELECTRICAL ENGINEER	 MECHANICAL & PLUMBING ENGINEER
 CIVIL ENGINEER	 STRUCTURAL ENGINEER	LANDSCAPE ARCHITECT

Lake Charles Event Center Green Rooms CP 3507

900 Lakeshore Drive
Lake Charles, Louisiana 70601

Date: April 10, 2026
GHC Project #: 4024119

Project Description:

GREEN ROOM ADDITIONS AND RENOVATIONS PROJECT FOR THE LAKE CHARLES EVENT CENTER (LCEC) SPACES INCLUDES:
BASE BID - MULTIPURPOSE ROOM ADDITION (GREEN ROOM),
ALTERNATE No.1 - EAST AND WEST RESTROOM / SHOWER & DRESSING ROOM RENOVATION,
ALTERNATE No. 2 - LOCKERS WITH CURTAIN SYSTEM ADDED TO ALTERNATE No. 1 SCOPE, AND
ALTERNATE No. 3 - SOUTH RESTROOM, SHOWERS, DRESSING ROOMS, AND LOUNGES (EAST & WEST SIDES OF ARENA) (GREEN ROOMS).

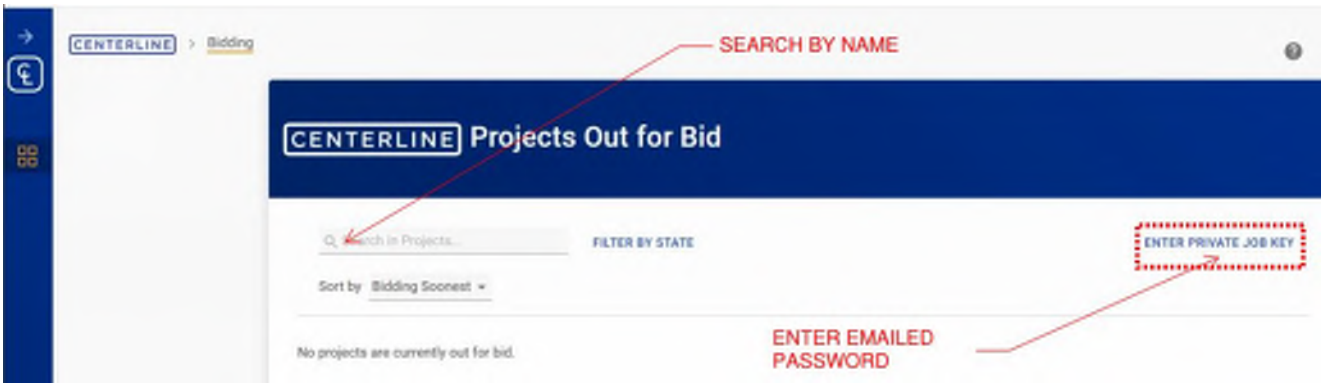
SECTION 00 0005a - HOW TO ACCESS BIDDING DOCUMENTS - PLAN HOLDER'S LIST

1. Go to the following site:
   www.centerline.co

If this is your first time to Centerline's bidding module, you will need to go to bottom left hand corner of the screen and press the BID MODULE LOGIN button, fill out the form and your password will be emailed to you, then continue with instructions. Sign up if you are a first time user.

2. **Type in your username (complete email address) and password. (if you forgot it, press "forgot password", your password will be emailed to you. Go back to loginscreen.**

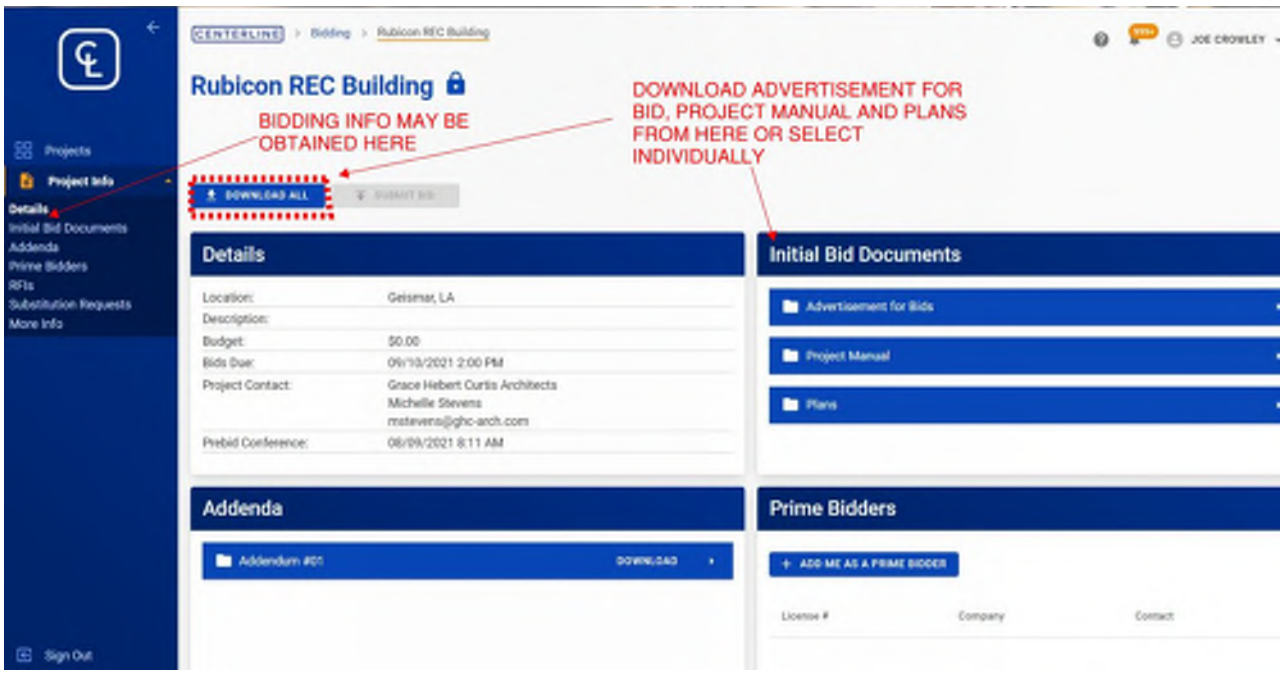
3. **If this is a PRIVATE bid that you have been invited to, you will need to enter the PRIVATE PROJECT PASSWORD that was emailed to you with theinvite. The PASSWORD is in the BID MANAGEMENT tab. See next page.**
4. **The first time you log in, you will be asked to change your password.**
5. **Once in scroll until you will see the project name that you are lookingfor.**
6. **Click on the project.**
7. **The BID MODULE IS ON THE LOWER LEFTHAND SIDE OF THE SCREEN.**
8. **You will be taken to a page that looks like the screenshot on the next page that reads "Projects Out for Bid".**



9. **Select Project Info and a drop down menu is seen to the left.**

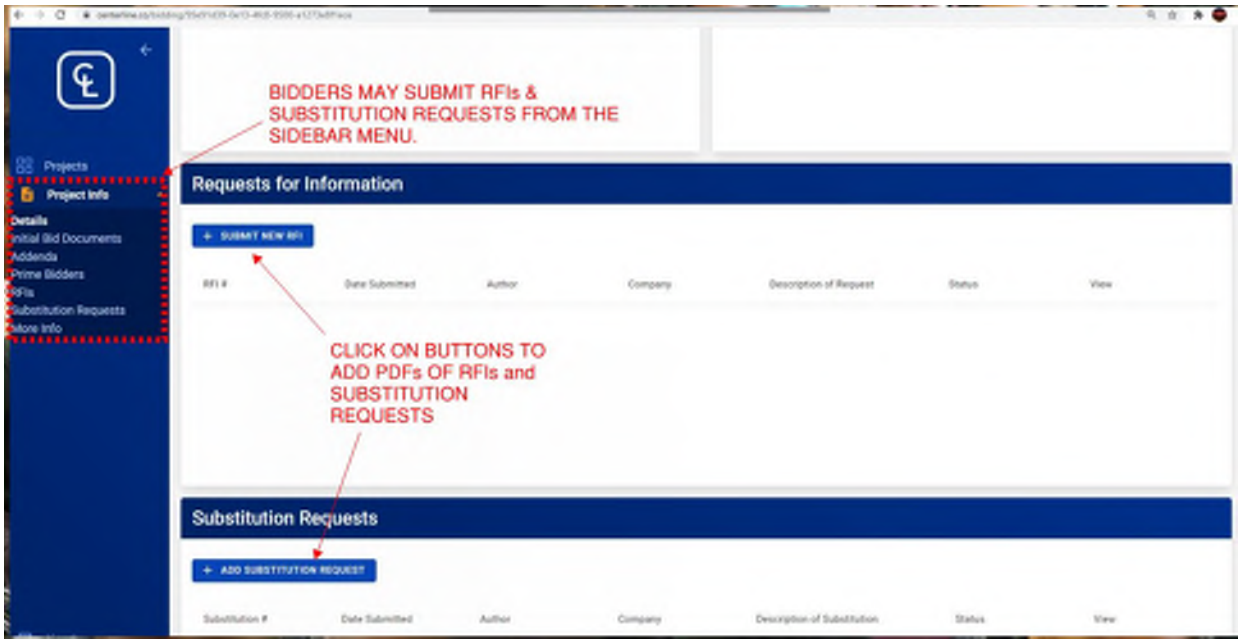
10. **You may download all Bid Documents, add yourself as a prime bidder and submit a bid on this page. Addenda, Prime Bidders, RFIs, Substitution Requests and More Info are placed here.**

11. **Print and download any info from this page.**



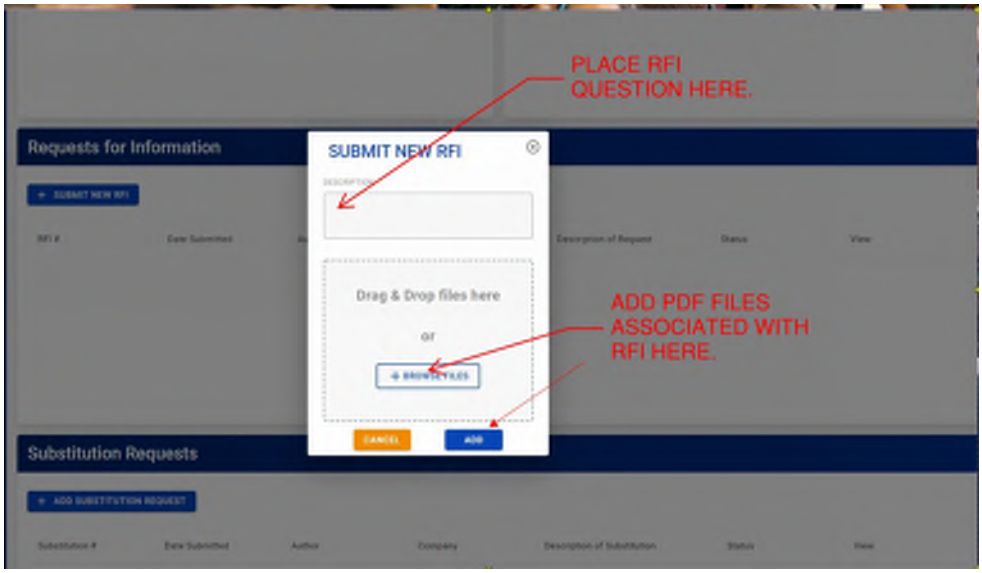
00 0005b - HOW TO ENTER REQUEST FOR INFORMATION (RFI) AND SUBSTITUTION REQUESTS FROM BIDDING SIDE

Once the bid is set up, and the User chooses the project and enters the password if a private bid, they will see the Submit buttons for NEW RFI's and SUBSTITUTION REQUESTS.

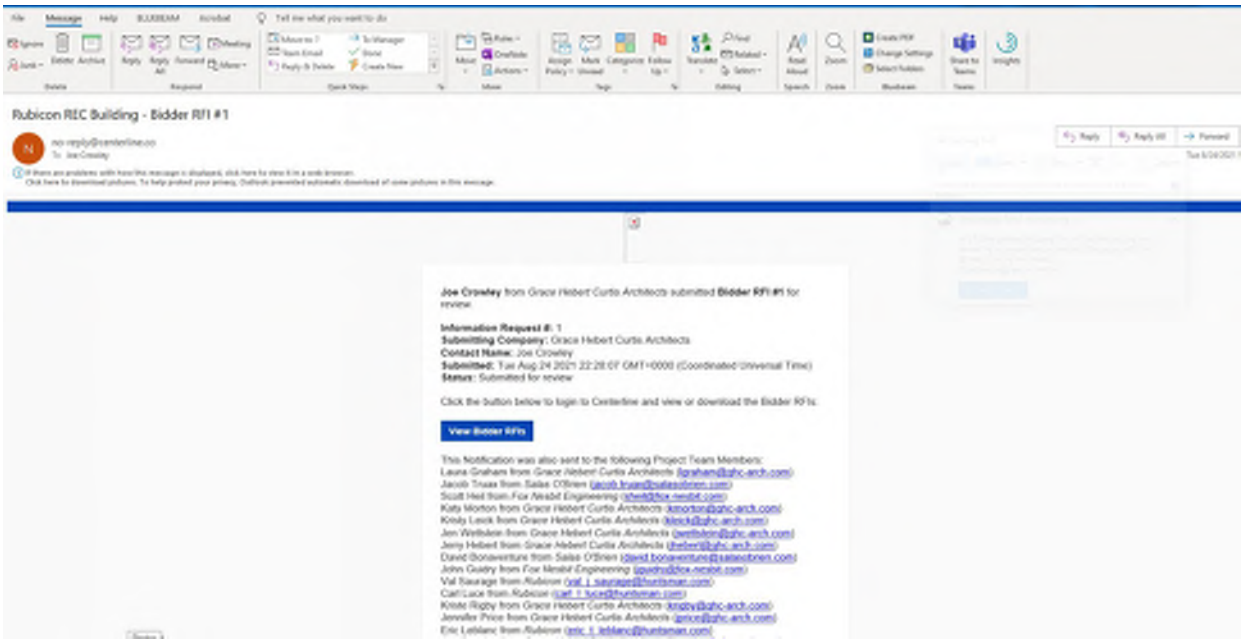


RFI

This is the SUBMIT NEW RFI form the contractor/sub-contractor will get. **Simply fill in the information and attach files and press SUBMIT RFI. Your RFI will then appear in the log below.**

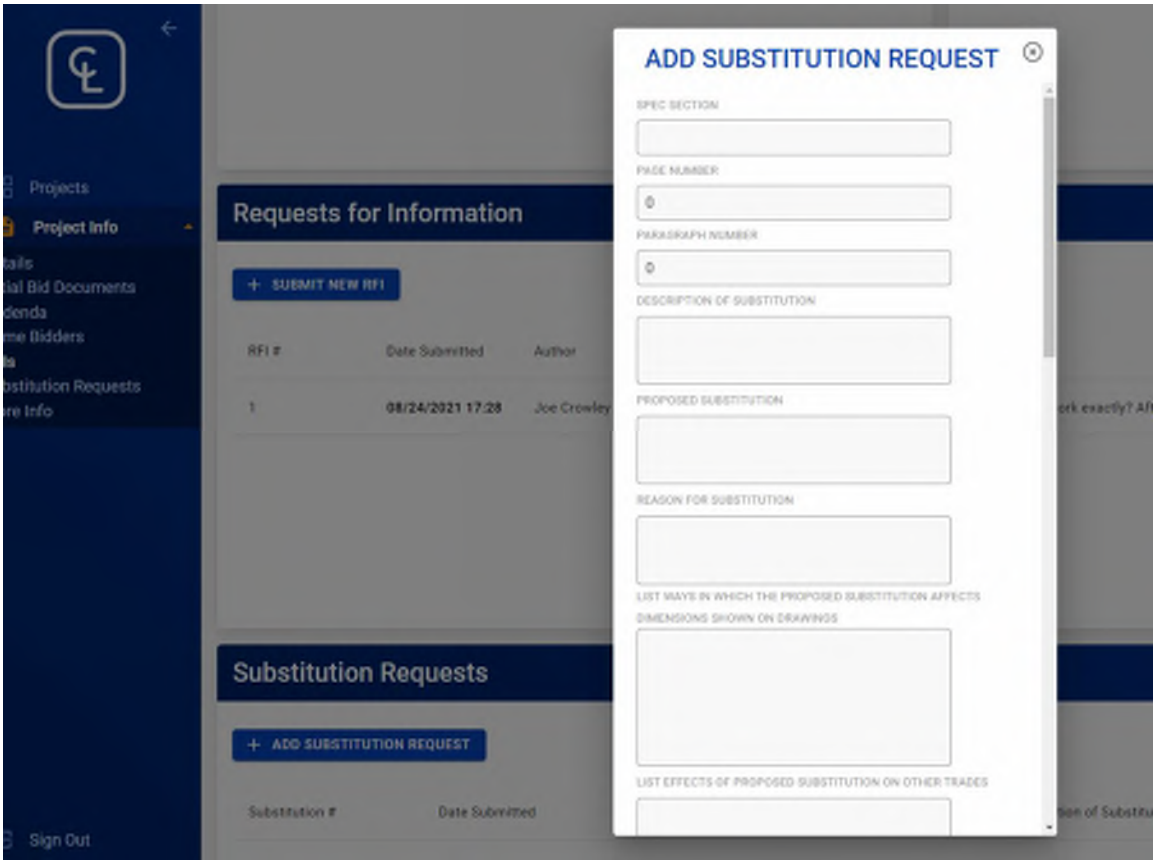


Once it is submitted, the User will receive an email to the person submitting it that it has been received. The Architect will receive a notification they have received an RFI for his project. You can click on the blue button in the email to take you to the RFI.



SUBSTITUTION REQUEST

This is what the Substitution Request looks like.
Simply fill in the information, attach necessary files and press SUBMIT SUBSTITUTION REQUEST.

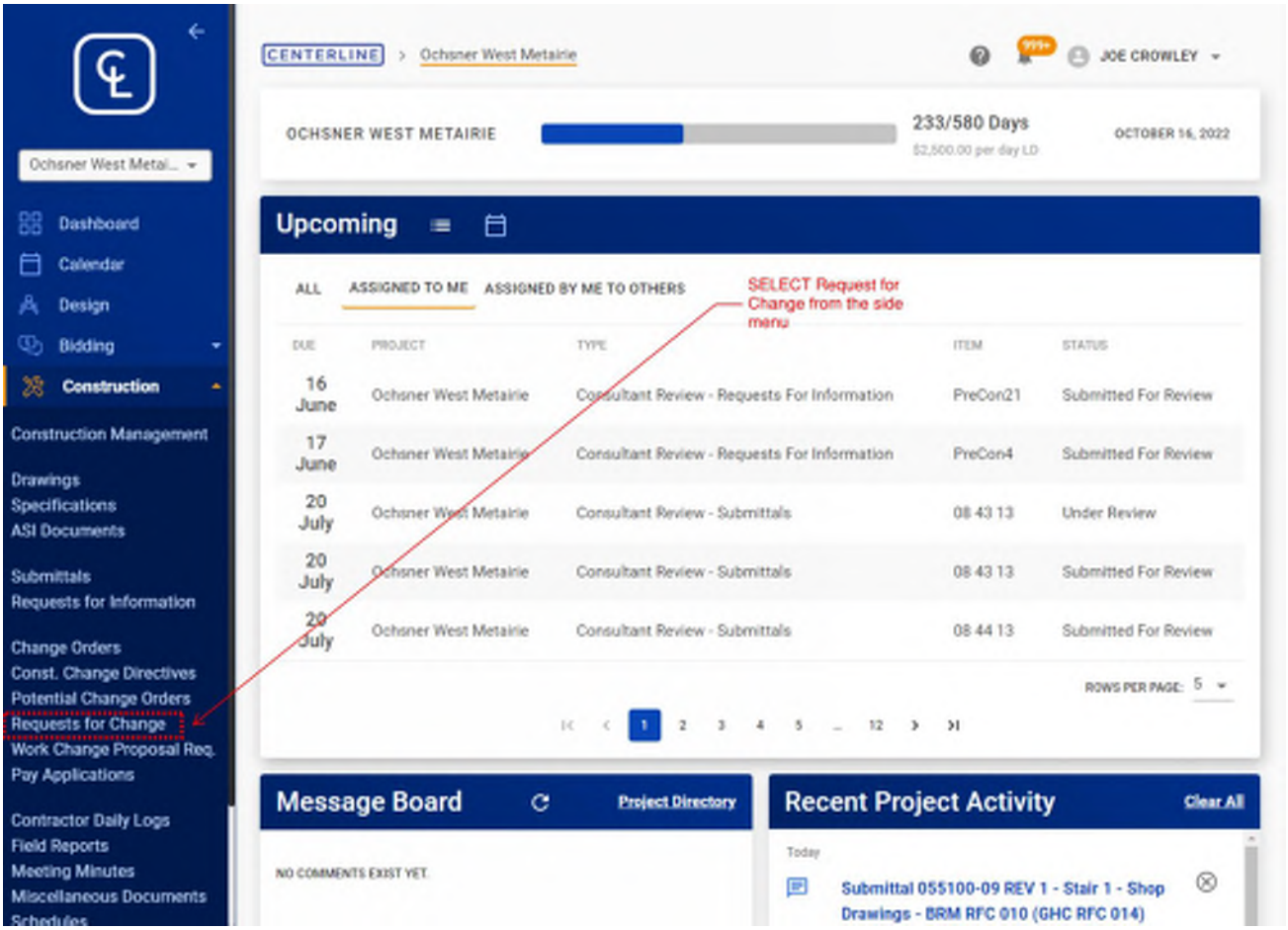


When you see the Substitution Request appear on the list where you submitted it, your Substitution Request has been submitted; you may VIEW the document and save or print as well from this location by clicking on the VIEW eyeball icon.

Once it is submitted, similar to RFIs, the User will receive an email noting that it has been received and the Architect will receive a notification that there is a Substitution Request for the project.

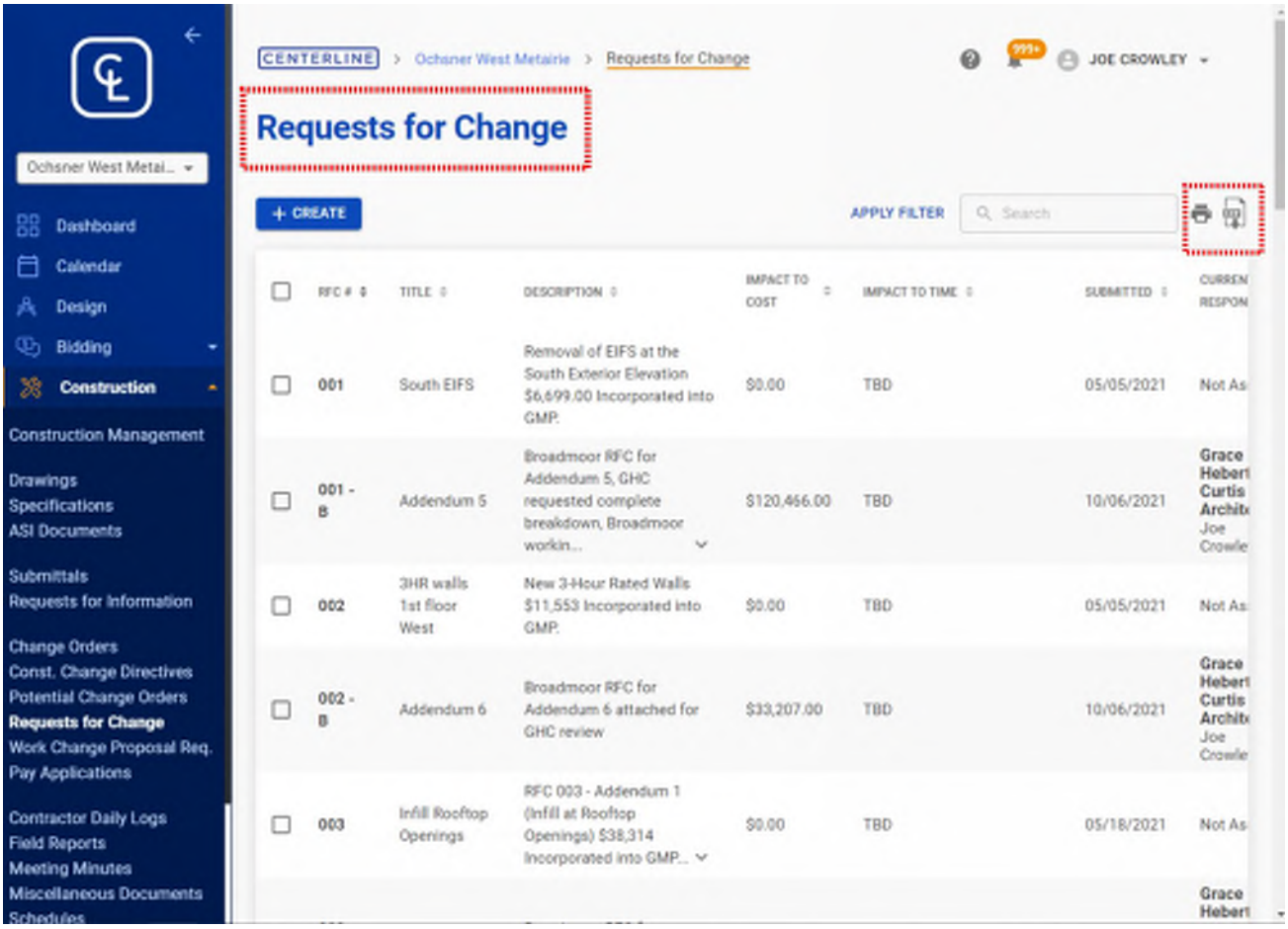
00 0005c – HOW TO ENTER REQUEST FOR CHANGE DURING CONSTRUCTION

Once the construction tab is open, and the User chooses the project and may select Request for Change to view documents that the Contractor is to price:



RFCs

The list of RFCs are displayed with the RFC #, brief description, potential impact to cost, impact to time, date submitted and current responsible party shown as seen below:



To print or save a copy of the RFC Log in PDF or Excel, click on the red rectangle in the upper right seen above.

Scroll down to view **SUPPORTING DOCUMENTS** which are organized by:

Current File and Previous Files.

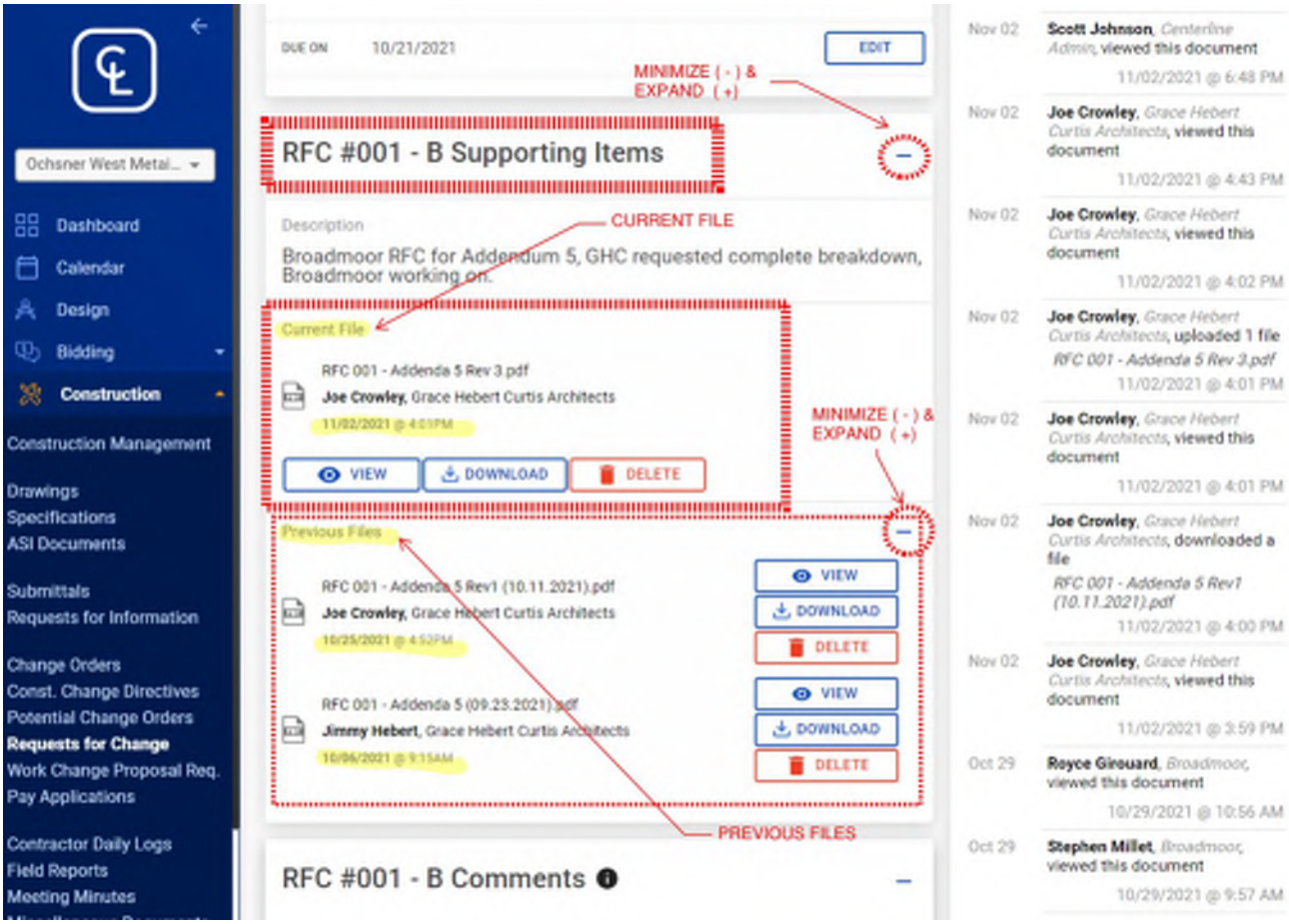
The Architect will place the Current File to be reviewed and responded to by the Contractor under the Current File tab highlighted below.

Only the files necessary to price the RFC will be located here. Previous files will be considered superseded by the Current File. Previous files may include a version of the Contractor's proposal with backup. Each file is date and time stamped to be able to easily track history of each document version.

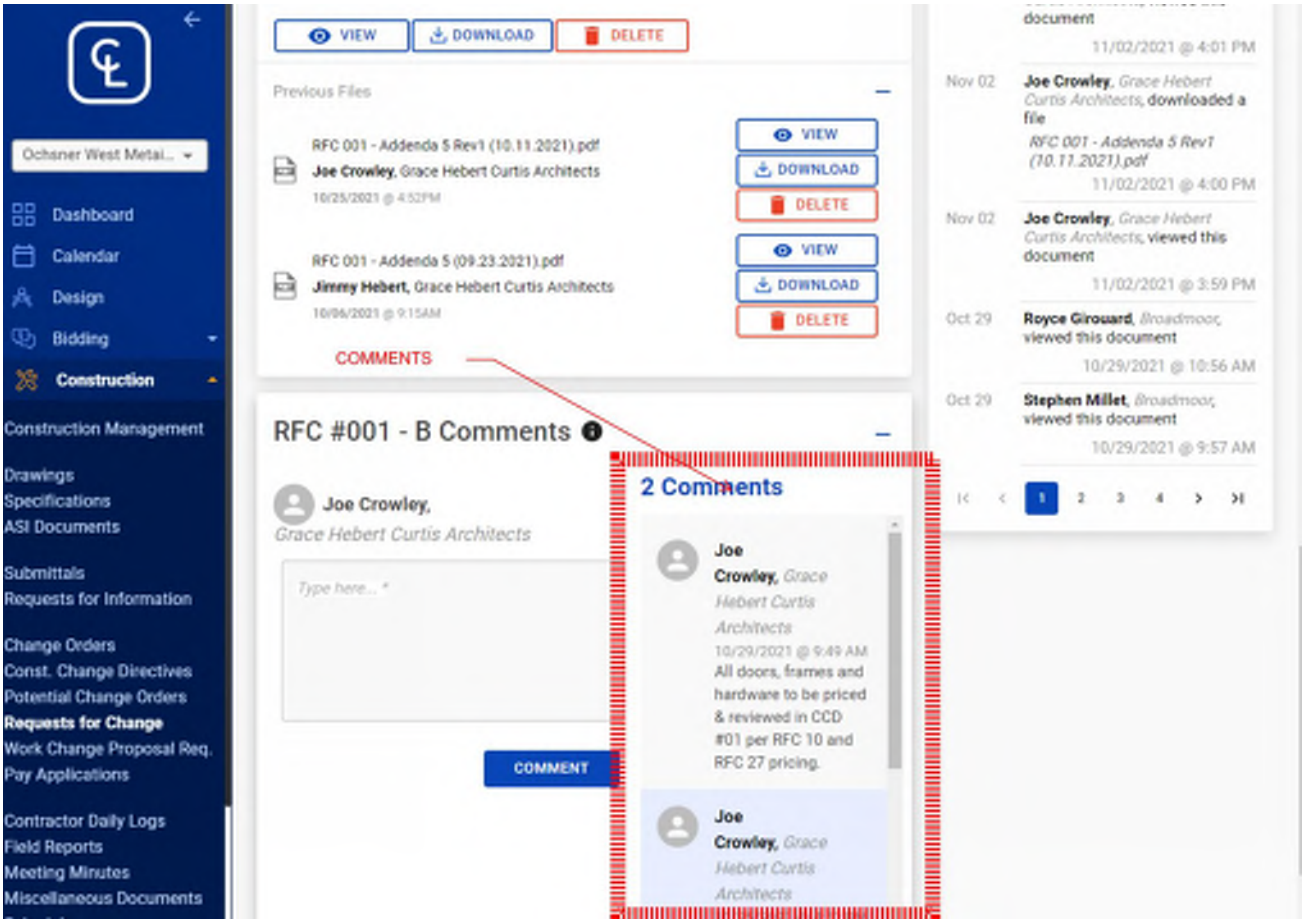
Minimize to not view all previous files if printing a summary page or expand to view previous version of files. See red circled area in the screenshot below.

Important Note to Architect, Contractor, et al:
Current file must be a **single file**.

If posting multiple files, i.e.: drawings, specifications, sketches, narratives, cutsheets and similar, Zip the files together and post the Zip folder. If files are similar in size format, i.e.: ALL full size drawings, they may be included in a single file PDF as well and posted.



Comments relevant to the RFC are below the Previous Files and are date and time stamped. Anybody in the distribution group may add comments here. While they are not part of the current file, they may modify the Request for Change and need to be reviewed. Status updates and similar comments may also be added here.



Date of Award: Month/Day/2026

TO: Contractor Name

ADDRESS: Address
State, LA Zip

PROJECT: Lake Charles Event Center Green Rooms

Client Bid# CP-3507
Grace Hebert Curtis Architects LLC Project No.: 4024119

Contract For: City of Lake Charles
326 Pujo Street
Lake Charles, LA 70601

You are notified that your Bid dated Month Day, 2026 for the above Contract has been considered. You are the apparent Successful Bidder and have been awarded a Contract for: Lake Charles Event Center Green Rooms.

The Contract Price of your Contract is: xx Dollars, ($xxx,xxx.xx).

This price includes Alternates numbered: List Alternates Included

Three original contracts accompany this Notice of Award.

You must comply with the following conditions precedent within fifteen (15) days of the date of this Notice of Award, this is by: Month Day, 2026.

1. You must deliver to the Architect three (3) fully executed original Contract documents. Each original of the Contract must bear your signature on all signatory lines within the Agreement

2. You must deliver with the executed contract, the signed Notice of Award, the required Performance and Payment Bonds and the required Insurance Certificates, (verifying additional insurer as required), and specified in Specification Section 00 0009 Supplementary Conditions.

Failure to comply with these conditions within the time specified will entitle the Owner to consider your bid in default, to annul this Notice of Award and to declare your Bid Security forfeited.

Within ten (10) days after you comply with the above conditions, the Owner will return to you one (1) fully signed counterpart of the Agreement and Notice to Proceed.

_____

By: _____
(Authorized Signature)

_____
(Title)

ACCEPTANCE OF AWARD

_____
(Contractor)

By: _____
(Authorized Signature)

_____
(Title)

_____
(Date)

SECTION 00 0010b – NOTICE TO PROCEED

TO: Contractors Legal Name

ADDRESS: Contractors Address

PROJECT: Lake Charles Event Center Green Rooms

Clint Bid# CP-3507
Grace Hebert Curtis Architects LLC, Project Number: 4024119

Contract For: City of Lake Charles
326 Pujo Street
Lake Charles, LA 70601

You are notified that the Contract Times under the above Contract will commence to run on Start Date. By that date, you are to start performing your obligations under the Contract Documents. The date of Substantial Completion is: Date of Substantial Completion.

Also, before you may start any Work at the site you must notify Architect of Start Date.

By: _____
(Authorized Signature)

_____
(Title)

ACKNOWLEDGED:

_____
(Contractor)

By: _____
(Authorized Signature)

_____
(Title)

_____
(Date)

SECTION 00 0023
AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) HAZARDS REPORT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. American Society of Civil Engineers (ASCE) Hazards Report for 900 Lakeshore Drive, Lake Charles, LA 70601.

PART 2 - PRODUCTS (Not Used)

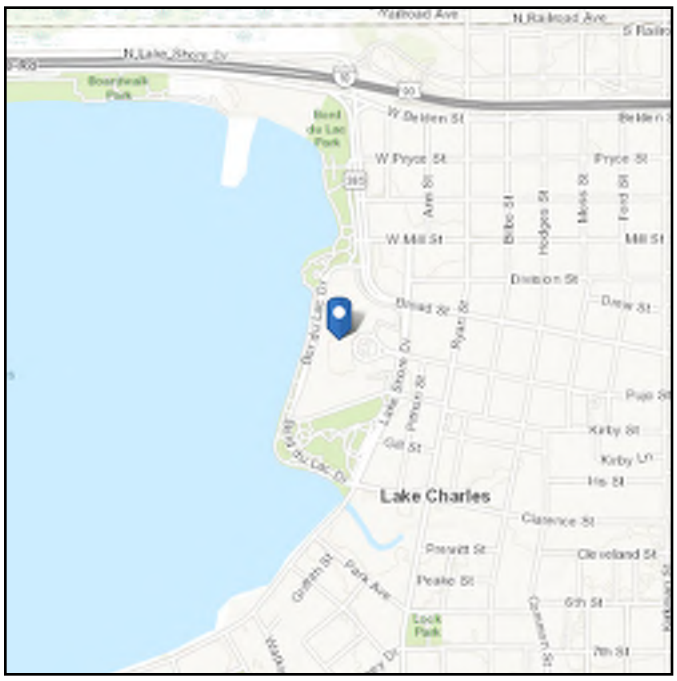
PART 3 - EXECUTION (Not Used)

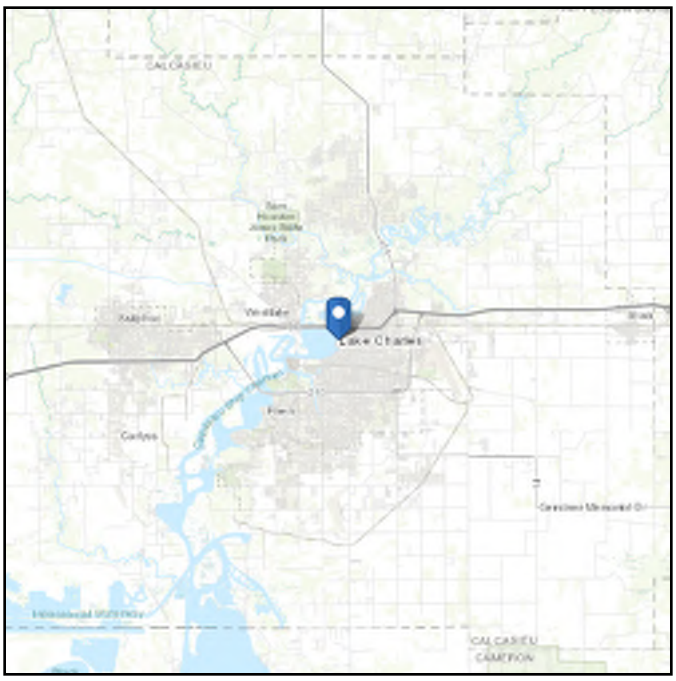
ASCE Hazards Report

Address:
900 Lake Shore Dr
Lake Charles, Louisiana
70601

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: undefined

Latitude: 30.22859
Longitude: -93.221468
Elevation: 10.049423215282319 ft (NAVD 88)





Wind

Results:

Wind Speed	131 Vmph
10-year MRI	75 Vmph
25-year MRI	86 Vmph
50-year MRI	97 Vmph
100-year MRI	106 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Thu Feb 26 2026

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE Hazard Tool.

SECTION 00 0024
FEMA FIRMETTE WITH FLOOD ZONE DETERMINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

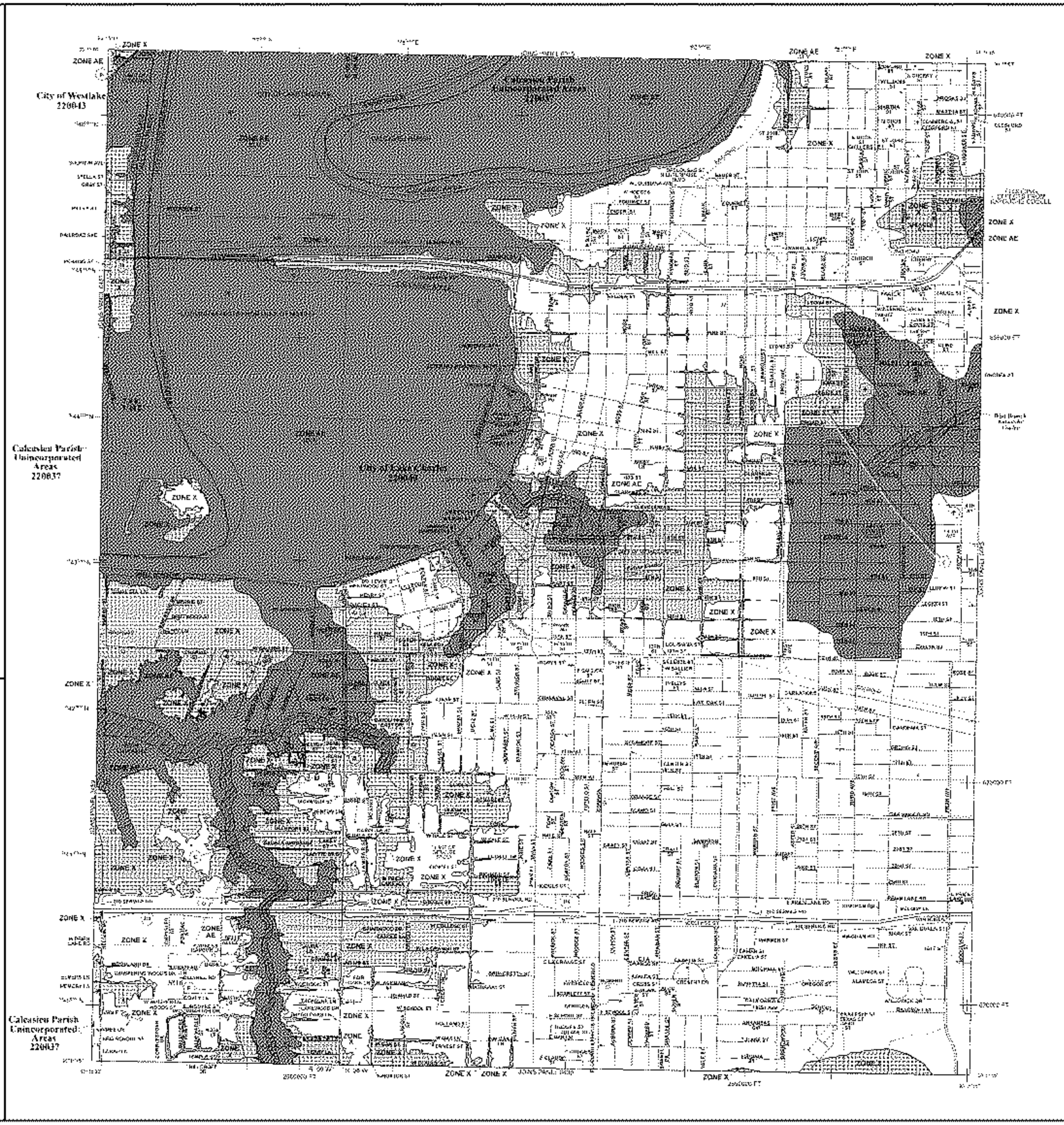
1. FEMA FIRMette with Flood Zone Determination for located at 900 Lakeshore Drive, Lake Charles, LA 70601.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

NOTES TO USERS

LEGEND



PANEL 0460F

FIRM

FLOOD INSURANCE RATE MAP

CALCASIEU PARISH,
LOUISIANA
AND INCORPORATED AREAS

PANEL 460 OF 715

MAP NUMBER
22019C0460F

EFFECTIVE DATE
FEBRUARY 18, 2011

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

ADVERTISEMENT FOR BIDS

Public notice is hereby given that sealed bids are to be received at www.bidexpress.com or by mail or hand delivered in the office of Clerk of Council of the City of Lake Charles, located on the 4th Floor of City Hall at 326 Pujo Street, Lake Charles, Louisiana, 70601 until two forty five p.m. (2:45 p.m.) central standard time on the **19th day of May 2026**, and will be publicly opened and read aloud in the City Council Chambers on the 1st Floor of City Hall at 326 Pujo Street, Lake Charles, Louisiana 70601 at three p.m. (3:00 p.m) central standard time. For the following Project:

City of Lake Charles, Louisiana
Lake Charles Event Center Green Rooms
CP 3507

All bids must be submitted on the proper bid form or electronic bid form. The Contractor shall display his Contractor's license number prominently on the outside of the envelope on paper bids. Bids received after the above specified time for opening shall not be considered and shall be returned unopened to the sender.

Complete Bid Documents as prepared by Grace Design Studios for this Project are available in electronic form. They may be obtained without charge and without deposit from www.bidexpress.com or from www.centerlinebidconnect.com. If you are not currently a subscriber, you will need to apply for "Free Access". Access to the project will allow you to view, download or send documents to a printer. Printed copies are not available from the Owner or Architect, but arrangements can be made to obtain printed Bid Documents through most reprographic firms. Bidders are responsible for any subscription, downloading, reproduction or mailing costs.

All bids shall be accompanied by a certified check, cashier's check, or bid bond payable to the City of Lake Charles, the amount of which shall be five percent (5%) of the base bid and all alternates. 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 to write individual bonds up to ten percent of policyholders' surplus as shown in 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. The bid bond shall be issued by a company licensed to do business in Louisiana and who is under contract with the surety company or bond issuer as a licensed agent in this state and residing in this state. The certified check, cashier's check or bid bond shall be given as a guarantee that the bidder shall execute the contract, should it be awarded to him, in conformity with the contract documents within fifteen (15) days of the Notice of Award.

No Bidder may withdraw his bid within forty-five (45) days after the actual date of the opening thereof; except as prescribed in LA R.S. 38:2215 A. Bids and Bid Bonds shall be submitted only on the forms provided with the specifications.

The successful bidder shall be required to furnish a Performance and Payment Bond in an amount equal to 100% of the Contract amount, shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list (Circular 570) or approved bonding companies which is published annually in the Federal Register. The public shall incur no obligation to the Contractor until the contract between the City and the Contactor is fully executed.

Contractors or contracting firms doing work which is classed as "Hazardous Materials" or any sub classification, shall be properly licensed when the work to be performed is $1.00 or more. Contractors or contracting firms submitting bids for work besides Hazardous Materials, shall be properly licensed for any work in the amount of $50,000.00 or more. All such bidders shall certify that they are licensed Contractors under Chapter 24 of Title 37 of the Louisiana Revised Statutes.

As a requirement under LA R.S. 37:2163, this project is classified by the Architect. The Contractor shall reference Section 00200 – Instructions to Bidders Part 3.6.1 for the required licensure classification.

Bids will be evaluated by the City of Lake Charles based on the lowest responsible bid submitted which is also in compliance with the specifications. The City of Lake Charles reserves the right to reject any and all bids in accordance with the provisions of LA R.S. 38.2211, et seq. Bids in the amounts specified above which have not bid in accordance with the requirements, shall be rejected and shall not be read. Additional information relative to licensing may be obtained from the Louisiana State Licensing Board for Contractors, Baton Rouge, Louisiana.

Attention is called to the fact that the Contractor must ensure that employees and applicants for employment are not discriminated against because of race, creed, color, or national origin. The City of Lake Charles fully complies with Title VI of the Civil Rights Act of 1964, Americans with Disabilities Act, and related statutes, executive orders, and regulations in all programs and activities. The City operates without regard to race, color, national origin, income, gender, age, and disability. Any person who believes him/herself or any specific class of persons, to be subjected to discrimination prohibited by Title VI/Americans with Disabilities Act may by him/herself or by representative file a written complaint with the City of Lake Charles. The City's Title VI Coordinator/ADA Coordinator may be reached by phone at (337) 491-1440, the Mayor's Action Line at (337) 491-1346, or contact the appropriate Department Head.

A pre-bid conference will be held at the Department of Public Works, 4331 E. Broad Street, Lake Charles LA 70615, phone: 337-491-1308 on May 8, 2026 at 11:00 a.m. Attendance at this conference is **MANDATORY**. Bidders are advised that they will be required to state on the bid form that they have personally inspected and are familiar with the project site.

PUBLISH DATES:
April 24, 2026
May 1, 2026
May 8, 2026

CITY OF LAKE CHARLES, LOUISIANA

By: s/Marshall J. Simien, Jr.
MARSHALL J. SIMIEN, JR, Mayor

ATTEST:
s/Renee P. Deville
CLERK OF THE COUNCIL

SECTION 00200

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS

1.1 Terms used in these Instructions to Bidders which are defined in the Standard General Conditions of the Construction Contract have the meanings assigned to them in the General Conditions. The term "Bidder" means one who submits a Bid directly to Owner, as distinct from a "Sub-bidder", who submits a Bid to the Bidder. The term "Successful Bidder" means the lowest, qualified, responsible, and responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) proposes to make an award. The term "Bidding Documents" includes the Advertisement for Bids, Instructions to Bidders, the Bid Form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids) and the Drawings.

2. COPIES OF BIDDING DOCUMENTS

2.1 Complete sets of Bidding Documents in the number and for the sum stated in the Advertisement for Bids may be obtained as stated in the Advertisement for Bids.

2.2 Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Architect assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents by Bidders and their Sub-bidders.

2.3 Owner and Architect in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

2.4 No Bidding Documents will be issued later than twenty-four (24) hours of the date set for receiving bids, as provided by Louisiana Revised Statutes.

3. QUALIFICATIONS OF BIDDERS

3.1 It is the intention of the Owner to award this contract to a Bidder competent to perform and complete the Work in a satisfactory manner and who proposed to employ Subcontractors, if any, competent to perform their portion of the Work in a satisfactory manner. Accordingly the apparent responsible low bidder shall fully complete and submit the Subcontractor List (Section 00435), provided herein, within ten (10) calendar days after the bid opening. Failure to submit this form within the specified time frame will result in the bidder being declared as non-responsive, in accordance with LA R.S. 38.2212(B)(3)(a).

3.2 The Owner shall consider the Bidder qualifications, Subcontractors, and suppliers in evaluating the Bidder's bid and shall have the right to reject any Bidder for any reason set forth in LA R.S. 38:2211, et seq.

3.3 Should the Owner request additional information about the Bidder and proposed Subcontractors, following the submission of the Subcontractor List (Section 00435), the Bidder shall submit within seven (7) days of Owner's request the specific additional information requested by the Owner to define in greater detail the Bidder's bid proposal for Owner's evaluation. Such information shall have the same legal significance as if submitted with the original bid and, if the bid is accepted, shall become legally binding on the Successful Bidder.

3.4 The following reasons may be considered as being sufficient for the disqualification of a Bidder

and the rejection of his Bid proposal or proposals; however, this list is not all inclusive:

3.4.1 More than one Bid received for the same work from an individual, firm or partnership, a corporation, or association under the same or different names will not be considered. Reasonable grounds for believing that any Bidder is interested in more than one Bid for the same work will cause the rejection of all such Bids in which the Bidder is interested.

3.4.2 If there are reasonable grounds for believing that collusion exists among the Bidders, the Bids of participants in such collusion will not be considered. Participants in such collusion will receive no recognition as Bidders for any future work until any such participant shall have been reinstated as a qualified Bidder.

3.4.3 Default of any contract in force with the Owner at the time of Bid opening.

3.4.4 If the Bidder has withdrawn his bid from consideration after the bids were opened at a previous bid opening under this same project.

3.5 Should a prospective Bidder or low Bidder be rejected on the grounds that such a bidder is not a "responsible bidder" the following procedures shall be followed in accordance with LA R.S. 38:2212(X)(1):

3.5.1 Give written notice of the proposed action to such bidder and include in the written notice all reasons for the proposed action.

3.5.2 Give the bidder who is proposed to be disqualified the opportunity to be heard at an informal hearing at which such bidder is afforded the opportunity to refute the reasons for the proposed action.

3.5.2.1 The informal hearing shall be conducted prior to the award of the public work.

3.5.2.2 The informal hearing shall be a condition precedent to any action by the bidder adverse to the public entity, its representatives, employees, and designers.

3.5.2.3 The informal hearing shall be conducted by the public entity not later than five (5) business days after the date of the notice of disqualification of such bidder. The public entity shall issue a ruling in writing and deliver it to the affected bidder not later than five (5) business days after the date of the informal hearing.

3.5.2.4 No award of the contract for the public work shall be made by the public entity prior to the expiration of at least five working days following the date of issuance of the decision by the hearing official.

3.6 Bidders on projects in the amount of fifty thousand dollars ($50,000) or more shall be required to have a Louisiana Contractor's license and classification applicable to the work in compliance with Louisiana State Licensing Board for Contractors and in compliance with Louisiana Revised Statutes. Any bid that does not require the contractor to hold an active license shall state the exemption on the bid envelope in accordance with (Act 422-R.S. 37:2165).

3.6.1 The worked covered by these bid documents has been classified by the Architect in accordance with LA R.S. 37:2156.1 and LA R.S. 37:2156.2 as: **Building Construction.**

3.6.2 Following an initial an initial contact to the Architect, any person may object to the above stated classification(s) by sending a certified letter to both the State of Louisiana Licensing Board of Contractors and to the Architect. The objection shall be received by State of Louisiana Licensing Board of Contractors and the Architect within ten (10) working days prior to the date on which bids are to be opened. The objection shall explicitly state the

reasons for the objection. The objection shall be submitted to a committee for determination. The Chairman of the Licensing Board shall appoint the committee, which shall consist of board members. The Committee shall have the power to approve the project classification or add an additional classification by vote of a majority of the members of the committee. The matter shall be resolved and the board shall notify the Architect within five (5) working days prior to the date on which bids are to be opened, unless all parties agree that a delay will not cause harm to others.

4. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

4.1 It is the responsibility of each Bidder, before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site to become familiar with local conditions that may in any manner affect cost, progress, performance or furnishing of the Work, (c) consider federal, state and local laws, ordinances, rules and regulations that may in any manner affect cost, progress, performance or furnishing of the Work; (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Architect of all conflicts, errors or discrepancies in the Contract Documents requiring correction, clarification, or interpretation.

4.2 Information and data reflected in the Contract Documents with respect to underground facilities at or contiguous to the site are based upon information and data furnished to Owner and Architect by Owners of such underground facilities or others, and Owner does not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary Conditions.

4.3 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, underground facilities and other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in the General Conditions.

4.4 Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies, and obtain any additional information and data which pertain to the physical conditions (surface, subsurface and underground facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance, or furnishing the Work in accordance with the time, price, and other terms and conditions of the Contract Documents.

4.5 On request in advance, Owner will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the site to its former condition upon completion of such explorations.

4.6 The lands upon which the Work is to be performed, right-of-ways and servitudes for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by Contractor. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by Owner unless otherwise provided in the Contract Documents.

4.7 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and such means, methods, techniques, sequences, or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail

to indicate and convey understanding of all terms and conditions of performance and furnishing of the Work.

5. INTERPRETATIONS AND ADDENDA

5.1 All questions about the meaning or intent of the Contract Documents are to be directed to the Architect. Interpretations or clarifications considered necessary by Architect in response to such questions will be issued by Addenda mailed, faxed, or emailed to all parties recorded by Architect as having received the Bidding Documents. Questions received less than seven (7) working days prior to the date for opening of Bids may not be answered. Only answers to questions by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

5.2 Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner.

5.3 No addenda will be issued within seventy-two (72) hours of the advertised time for the opening of bids, excluding Saturdays, Sundays and any other legal holidays; without resulting in the extending the bid period for at least seven (7) but not more than twenty-one (21) working days, without the requirement of re-advertising as provided by LA R.S. 38:2212(O)(2)(b).

6. BID SECURITY

6.1 Each Bid must be accompanied by Bid security made payable to Owner in an amount of five percent (5%) of the Bidder's maximum Bid price and in the form of a certified or cashier’s check or a Bid Bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions and Paragraph 6.3 below.

6.2 The Bid Security of the apparent Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required Payment and Performance Bonds, whereupon the Bid Security will be returned. If the apparent Successful Bidder fails to execute and deliver the Agreement and furnish the required Bond, Affidavits and Insurance Certificate within fifteen (15) calendar days of the Notice of Award, Owner may annul the Notice of Award, and the Bid Security of that Bidder will be forfeited. The Bid Security of any Bidder whom the Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the forty-sixth (46th) day after the Bid opening, whereupon Bid Security of such Bidders will be returned. The Owner and the Bidder may mutually agree to extend the forty-five (45) day period for holding the Bids and the Bid Security, as provided by Louisiana Revised Statutes. Bid Security of other Bidders will be returned approximately seven (7) days after the Bid opening.

6.3 In accordance with LA R.S. 38:2218.C, all Bid Guaranty Bonds shall be written by a surety or insurance agency currently on the U.S. Department of Treasury Financial Management Service list of approved companies, 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 bonds either domiciled in Louisiana or owned by Louisiana residents.

7. CONTRACT TIME

7.1 The number of days within which, or the dates by which, the WORK is to be Substantially Completed, and also completed and ready for final payment (the Contract Time) are set forth in Article 3.1 of the Agreement, Section 00500.

7.2 This contract time shall be on a **calendar day or working day** basis as set forth in Article 3.1 of the

Agreement, Section 00500. In the case of a calendar day contract, the calendar days shall consist of the consecutive number of calendar days stated in the Agreement, Section 00500, including all Saturdays, Sundays, and Holidays.

7.3 In accordance with LA R.S. 38:2215(C) the Owner shall issue the Notice to Proceed no later than thirty (30) days following the date of execution of the contract by both parties, whichever date is later. However, the public Owner and the Contractor, upon mutual written consent of both parties, may agree to extend the deadline to issue the notice to proceed.

7.4 The WORK shall begin no later than ten (10) calendar days after the date to begin work as stipulated in the Notice to Proceed. Failure to start construction within the ten (10) day grace period and/or conduct the work in such a manner or with sufficient materials, equipment, and labor necessary to insure completion within the Contract time may be first cause for default of the Contract.

8. LIQUIDATED DAMAGES

8.1 In the event the Contractor fails to satisfactorily complete the entire work intended and provided for under this contract within the time as provided, liquidated damages shall be assessed against the Contractor by the Owner by deducting damages as follows:

Original Contract Amount (Dollars)		Daily Charge (Dollars)	
For More Than	To and Including	Calendar Day	Working Day
$0	$25,000	$80	$195
$25,000	$50,000	$210	$345
$50,000	$100,000	$240	$400
$100,000	$500,000	$270	$510
$500,000	$1,000,000	$330	$595
$1,000,000	$2,000,000	$400	$695
$2,000,000	$5,000,000	$480	$825
$5,000,000	$10,000,000	$600	$975
$10,000,000	----------	$630	$1,115

9. SUBSTITUTE MATERIALS OR PRODUCTS – PRIOR APPROVALS

9.1 In unusual cases where a closed specification has been justified for prior acceptance by the Owner in conformance with LA R.S. 38:2291 and LA R.S. 38:2295. A and B, the naming of that product in the Drawings and Specifications will be followed by wording indicating that no substitution is permitted.

9.2 Otherwise, where the Drawings and Specifications identify a product by a single specific brand, make, manufacturer, or definite specification it is to establish the required quality standard for the product regarding style, type, character, materials of construction, function, accessories, dimensions, appearance and durability. Products which are determined to be equivalent by the Architect will be acceptable. Products which are specified by a specific brand, make or

manufacturer's name may also be specified by its applicable model or catalog number or other product designation.

9.3 If the Bidder desires to obtain approval of materials or equipment from other alternative suppliers or manufacturers to those identified in the Specifications or noted on the Drawings, a written request for a substitution shall be submitted to the Architect at least seven (7) working days prior to the Bid date as specified in LA R.S. 38:2295(C). Each such request shall include the name of the material or equipment for which it is to be substituted and complete description of the proposed substitute including drawings, cuts, performance and test data and other information necessary for an evaluation.

9.4 A statement setting forth any changes in other materials, equipment, or Work that incorporation of the substitute would require shall be included. Any proposed substitution shall include the cost of any necessary changes in the Project to substitute the proposed equipment, material or product for a complete installation. Basis of design of this Project is based upon the specified suppliers or manufacturers. Certain materials or equipment may meet the specification requirements with changes and/or modifications to their standard equipment and may include redesign of structures, hydraulics, processes, instrumentation and controls, electrical system and mechanical systems. In such a case, a substituted supplier or manufacturer will be accepted if such offered product is at least equivalent to the product specified, and the cost of any redesign is covered as specified. Should the Contractor propose furnishing substitute materials or equipment, the Contractor shall comply with the following:

a. The Contractor shall reimburse the Architect through the Owner for any associated Architectural costs for redesign and/or construction drawings production generated by any dimensional, mechanical, electrical, instrumentation, civil/site work, architectural, and structural changes and/or requirements for Manufacturer/Supplier. The bid for such Substitute Manufacturer/Supplier shall also include any proof of the merit of the proposed substitute is upon the Bidder.

b. Reimbursement for Architecting redesign shall be based on the Architect’s published hourly rates effective at the time of review or redesign plus any direct non-labor expenses such as travel, per diem, or reproduction services. Work necessary to furnish and install the equipment, including reimbursement described above and other modifications to the Work necessary to make the several parts fit together and perform as specified shall be at no additional cost to the Owner.

9.5 The Architect's decision of approval or disapproval of a proposed substitution shall be final. If Architect approves any proposed substitution, such approval will be set forth in an Addendum issued to all prospective Bidders, within three (3) days, exclusive of holidays and weekends, after the potential Bidder’s submission of a substitute material. Bidders shall not rely upon approvals made in any other manner. If a substitute offered by the Contractor is not found by the Architect to be equal to the material specified, the Contractor shall furnish and install the material specified.

9.6 After the receipt of Bids, the Contract, if awarded, will be on the basis of material and product described in the Drawings or specified in the Specifications without consideration of possible substitute of "or equal" items except as specified in 9.3 above.

10. SUBCONTRACTORS

10.1 All Subcontractors being assigned a portion of the Work in the amount of fifty-thousand dollars ($50,000) or more must possess a current Louisiana Contractor's license of the proper

classification, as provided by Louisiana Revised Statutes. Furthermore, any Subcontractor who enters into a subcontract in the which the Subcontractor is to provide labor only, and the Contractor is to provide the materials, that Subcontractor must possess a current Louisiana Contractor's license of the proper classification if the combined cost of the Subcontractor's labor and the materials provided by the Contractor is $50,000 or more, even if the Subcontractor's labor cost is less than $50,000 pursuant to LA R.S. 37:2150.1(3).

10.2 In accordance with Ordinance No. 12743 of the City of Lake Charles, Louisiana, the Bidder shall identify ALL Subcontractors which he proposes to employ on the Contract by NAME, ADDRESS, TELEPHONE, and SCOPE OF WORK. This information shall be provided in the Subcontractor List (Section 00435) which shall be submitted by the apparent low bidder within ten (10) days following the bid opening. If no Subcontractors are to be used on this project, the Bidder shall state this. The Contractor will be required to use all Subcontractors he identifies as listed on this form.

10.3 Should the Owner request additional information about the Bidder and proposed Subcontractors, following the submission of the Subcontractor List (Section 00435), the Bidder shall submit within seven (7) days of Owner's request the specific additional information requested by the Owner to define in greater detail the Bidder's bid proposal for Owner's evaluation. Such information shall have the same legal significance as if submitted with the original bid and, if the bid is accepted, shall become legally binding on the Successful Bidder.

10.4 If Owner or Architect after due investigation has reasonable objection to any proposed Subcontractor, supplier, other person or organization, either may, before giving the Notice of Award, request the apparent Successful Bidder to submit an acceptable substitute without an increase in Contract Price or Contract Time. If the apparent Successful Bidder declines to make any such substitution, Owner may award the contract to the next lowest responsible and responsive Bidder that proposes to use acceptable Subcontractors, Suppliers, and other persons and organizations. The declining to make requested substitutions will not constitute grounds for sacrificing the Bid security of any Bidder. Any Subcontractor, Supplier, other person, or organization listed and to whom Owner or Architect does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Architect subject to revocation of such acceptance after the "effective date of the Agreement" as provided in Paragraph 6.06 of the General Conditions.

10.5 No Contractor shall be required to employ any Subcontractor, Supplier, other person, or organization against whom he has reasonable objection.

10.6 Unless otherwise approved by the City Council, the total amount of subcontract work shall not exceed forty-nine percent (49%) of the Work.

11. BID FORM

11.1 The Bid Form (Section 00300) is included with the Bidding Documents; additional copies may be obtained from the Architect.

11.2 Bid Form shall be completed in ink or by typewriter. All blanks on the Bid Form must be completed.

11.3 Bids by corporations must be executed in the corporate name by a corporate officer accompanied by evidence of authority to sign in accordance with the Resolution form (Section 00485). The corporate address and state of incorporation must be shown where indicated on the bid form.

11.4 Bids by partnerships must be executed in the partnership name and signed by a partner whose

title must appear where indicated on the bid form, and the official address of the partnership must be shown below the signature.

11.5 All names must either be clearly written and legible or be typed or printed where indicated on the Bid Form.

11.6 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which shall be filled in where indicated on the Bid Form).

11.7 The address and telephone number for communications regarding the Bid must be shown where indicated on the bid form.

12. SUBMISSION OF BIDS

12.1 Paper bids shall be submitted on forms provided by the Owner at or before the time and at the place indicated in the Advertisement for Bids in accordance with LA R.S 38:2212(B)(6)(a). Both paper and electronic bids shall be subject to all requirements of the Contract Documents including the drawings, specifications, addenda, and these Instructions to Bidders. All bids must be regular in every respect and no interlineations, exclusions, or special conditions shall be made or included on the Bid Form by the Bidder.

12.2 If a bid is a paper bid, the bid, including the Bid Form, the Bid Security, and evidence of authority to sign the bid (if required) shall be enclosed in an opaque envelope. The envelope shall be sealed and clearly labeled with the name of the project, project number, name of bidder, bidder license number (where required), and the date and time of bid opening. All envelopes containing a Bid in the amount of fifty-thousand dollars ($50,000) or more shall bear the BIDDER'S Louisiana Contractor's license number, as provided by Louisiana Revised Statutes. Any bid that does not require the Contractor to be licensed shall state the exemption on the bid envelope. If the Bid is submitted through the mail, the sealed envelope containing the bid shall be enclosed in a separate envelope addressed as specified in the Bid Form and sent by registered or certified mail with a return receipt requested. If the bid is submitted by hand the deliverer shall request a written receipt.

12.3 Electronic bids shall conform to the same requirements of a paper bid described, herein, and shall be encrypted prior to sending using the City's key. The encryption level will ensure security. The City's on-line provider shall follow the standards for the receipt of electronic bids adopted by the office of the Governor, Division of Administration, and the Office of Information Technology as provided for in LAC 4:XV.701.

12.4 Any Bids received after the bid submission deadline will not be accepted under any circumstances. Any uncertainty regarding the time a Bid is received will be resolved against the Bidder. The Owner may consider as irregular any Bid on which there is an alteration of or departure from the electronic bid form or the paper bid hereto attached and at its option may reject the same.

13. MODIFICATION AND WITHDRAWAL OF BIDS

13.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the deadline for submitting Bids. A request for withdrawal or a modification must be in writing and signed by a person duly authorized to do so; and, in case signed by a deputy or

subordinate, the principal's proper written authority to such deputy or subordinate must accompany the request for withdrawal or modifications. Withdrawal of a Bid will not prejudice the rights of a Bidder to submit a new Bid prior to the Bid Date and Time. After expiration of the period for receiving Bids, no Bid may be withdrawn or modified.

13.2 If, within forty-eight (48) hours of the Bid opening, exclusive of Saturdays, Sundays and legal holidays, any Bidder who files a duly signed, and sworn written notice with Owner to the satisfaction of Owner that there was a patently obvious mechanical, clerical or mathematical error in its Bid, that Bidder may withdraw its Bid and the Bid Security will be returned as provided by LA R.S. 38:2214 [C]. Thereafter, the Bidder will be disqualified from future bidding and will not be permitted to provide any subcontract work on the Contract, for which the withdrawn bid was submitted, as provided by LA R.S. 38:2214 [D].

14. OPENING OF BIDS

14.1 Bids will be opened and (unless obviously nonresponsive) read aloud publicly. An abstract of the amounts of the base Bids and major alternates (if any) will be made available to Bidders after the opening of Bids.

14.2 For projects requiring licensing, any bid which does not show on the paper bid envelope or the electronic bid form, the Contractor's Louisiana Contractor's license number and contain the Contractor's license certification on the Bid Form, or any bid which does not state the exemption on the bid envelope or electronic bid form if the bid does not require the Contractor to hold a Louisiana Contractor's license shall be automatically rejected and returned to the bidder marked "Rejected," and shall not be read aloud.

15. BIDS TO REMAIN OPEN

15.1 As provided by LA R.S. 38:2215A., all Bids shall remain open for forty-five (45) calendar days after the day of the Bid opening, however as provided under LA R.S. 38:2215.D, these provisions are not applicable for projects requiring the sale of bonds or financed in whole or in part by federal or other funds which will not be readily available at the time bids are received.

15.1 Extensions of time when Bids shall remain open beyond the forty-five (45) calendar day period specified in LA R.S. 38:2215A may be made only by mutual agreement between the Owner and the lowest responsible bidder by one or more thirty (30) calendar day extensions.

16. NON-COLLUSION AFFIDAVIT

16.1 In accordance with the LA R.S. 38:2224, the apparent responsible low bidder shall execute and submit the Non-Collusion Affidavit (Section 00440) provided herein, within ten (10) calendar days after the bid opening, declaring that he has not entered into a collusive agreement with any other corporation, firm, nor person in preparation of his bid. Failure to submit this affidavit within the specified time frame will result in the bidder being declared as non-responsive.

17. FELONY CONVICTION/E-VERIFY AFFIDAVIT

17.1 In accordance with LA R.S. 38:2227 and LA R.S. 38:2212.10(C), the apparent responsible low bidder shall execute and submit the Felony Conviction and Employee Verification Affidavit (Section 00420) provided herein, within ten (10) calendar days after the bid opening, attesting that he has satisfied the requirements contained within said affidavit. Failure to submit this

affidavit within the specified time frame will result in the bidder being declared as non-responsive.

18. AFFIDAVIT OF COMPLIANCE WITH CLEAN AIR ACT AND WATER POLLUTION ACT

18.1 The apparent responsible low bidder shall execute and submit the Affidavit of Compliance with Clean Air Act and Water Pollution Act (Section 00425) provided herein, within ten (10) calendar days after the bid opening, attesting that he has satisfied the requirements contained within said affidavit. Failure to submit this affidavit within the specified time frame will result in the bidder being declared as non-responsive.

19. AWARD OF CONTRACT

19.1 For reasons of just cause, as provided by LA 38:2214 B, the Owner reserves the right to reject any and all Bids, to waive any informalities allowable by statute, and to disregard all nonconforming, nonresponsive, unbalanced or conditional Bids. Bids which are unsigned or are not accompanied by the required bid security shall be irrevocably rejected. When one or more bids are rejected, the reason therefore shall be given. Bids may be considered irregular and subject to rejection if they show serious omission, unauthorized alteration of form, unauthorized alternate bids, incomplete or unbalanced unit prices, or irregularities of any kind. Also, Owner reserves the right to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner. Discrepancies between words and figures will be resolved in favor of words. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

19.2 In evaluating bids, Owner will consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data as may be requested in the Bid Form or prior to the Notice of Award.

19.3 Owner will also consider the qualifications and experience of Subcontractors, suppliers, and other persons and organizations proposed for those portions of the Work whose identity must be submitted as provided in Article 3 of these Instructions to Bidders.

19.4 Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

19.5 If the contract is to be awarded, it will be awarded to the lowest responsible, responsive Bidder. Alternates, if accepted, shall be accepted in the order in which they are listed in the bid form. Determination of the low bidder shall be on the basis of the sum of the base bid and any alternates accepted. However, the Owner shall reserve the right to accept alternates in any order which does not affect determination of the low bidder.

19.6 If this contract should involve financial assistance with funds from other agencies, the Owner shall refer to the regulations of that agency concerning the determination of the Bidder to be awarded this contract.

20. CONTRACT SECURITY

20.1 Article 11.7 of the General Conditions sets forth Owner's requirements as to Performance and Payment Bonds. When the Successful Bidder delivers the executed Agreement to Owner, it must

be accompanied by the required Performance and Payment Bonds.

20.2 In addition to the requirements in Article 11.7 , in order to be acceptable to the Owner, a surety company issuing Bid Guaranty Bonds, or 100% Performance/Payment Bonds, called for in these Specifications, shall meet and comply with the following minimum standards:

20.2.1 Surety must be admitted to do business in the State of Louisiana and shall comply with the provisions of LA R.S. 38:2241. The Surety Company shall be listed by the U.S. Department of Treasury Financial Management Service (Circular 570 as amended) with an A-rating as provided under LA R.S. 38:2219.

20.2.2 Surety shall have been in business and have a record of successful continuous operations for at least five (5) years.

20.2.3 Attorneys-in-fact who sign bid bonds or performance/payment bonds must file with such bond a certified copy of their power of attorney to sign such bond.

20.2.4 Agents of surety companies must list their name, address and telephone number on all bonds.

20.2.5 Surety shall have at least the following minimum ratings:

CONTRACT AMOUNT	BEST'S RATINGS
up to $2,500,000	Class IV A- or better
$2,500,000 to $5,000,000	Class V A- or better
Above $5,000,000	Class V A- or better

20.2.6 The life of the bonds shall extend twelve (12) months beyond the date of final acceptance for warranty purposes and shall contain a waiver of alteration to the terms of the Contract, extensions of time and/or forbearance on the part of the Owner.

21. SIGNING OF AGREEMENT

21.1 When the Owner issues the Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement, as well as, all other Contract Documents attached. No more than fifteen (15) calendar days thereafter, the Contractor shall sign and deliver the required number of counterparts of the Agreement, additional Contract Documents, and the required Performance and Payment Bonds with insurance certificates to Owner.

21.2 Having satisfied all conditions of the award as set elsewhere in these documents, the successful bidder shall, within the period specified above, furnish bonds in the penal sum not less than the amount of the contract as awarded, as security for the faithful performance of the contract and for payment of all persons performing labor and furnishing materials in connection with this contract. Such bonds shall be in the form of the City of Lake Charles Performance and Payment Bonds and shall bear the same date as, or a date subsequent to that of the Agreement. The bonds shall be written by the Surety of Insurance Company satisfying all of the minimum standards set forth in Article 20 of The Instructions to Bidders.

21.3 The failure of the successful bidder to execute such agreement, additional contract documents, and to supply the required bonds within fifteen (15) calendar days after the Notice of Award is issued, or within such extended period as the Owner may grant, based on reasons determined sufficient by the Owner, shall constitute a default, and the Owner may either award the Contract to the next lowest bidder or re-advertise for bids, and may charge against the bidder the

difference between the amount of the bid and the amount for which a contract for the work is subsequently executed, irrespective of whether the amount thus due exceeds the amount of the bid bond. If a more favorable bid is received by re-advertising, the defaulting bidder shall have no claim against the owner for a refund.

21.4 Within fifteen (15) calendar days thereafter, Owner shall deliver one (1) fully signed counterpart of the Agreement, as well as, all other Contract Documents to Contractor.

22. RETAINAGE

22.1 Retainage of 10% of the value of WORK completed and materials stored on-site shall be deducted from the Contractor's Application for Payment for contract prices up to $500,000.00.

22.2 Retainage of 5% of the value of WORK completed and materials stored on-site shall be deducted from the Contractor's Application for Payment for contract prices of $500,000 or more.

23. RELATED WORK UNDER SEPARATE CONTRACTS

23.1 The Bidder's attention may be directed to the fact that the Work to be done under this contract may be only part of a Project consisting of improvements under several different contracts, that contracts may be let for the other portions of the Project, and that the success of the Project may be dependent upon the completion of the Work under this contract and the work to be done by others.

24. TAXES

24.1 In accordance with applicable rules adopted and promulgated by the Louisiana Department of Revenue, the Owner will designate the Contractor and all Subcontractors as its agents for the purchase and lease of materials, supplies or equipment for this Project as per LA R.S. 47:301 (8)(c). The Contractor and all Subcontractors shall accept the agency designation. The designation and acceptance thereof shall be made on the form prescribed by the Louisiana State Department of Revenue which form shall be part of the contract between the Owner, and the Contractor. A copy of this form is included in Section 00445.

24.2 The agency relationship between the Owner and the Contractor and all Subcontractors shall relieve the Contractor and Subcontractors (1) from paying any state or local sales taxes or state or local use taxes on materials, supplies or equipment which is affixed to and/or made a part of the real estate of the project or work or which is permanently incorporated into the project or work and, (2) from paying any state or local use taxes on any materials, supplies or equipment which is leased and used exclusively for the project or work. Accordingly, in preparing their bids and computing costs, the Contractor and Subcontractors shall not consider sales and/or use taxes which would otherwise be due.

24.3 The Contractor and Subcontractor shall furnish a copy of such certificate to all vendors or suppliers of any of the materials, supplies or equipment described above.

24.4 The Contractor and Subcontractors shall make all purchases and leases on behalf of and as the agent of the Owner.

24.5 The Contractor shall be responsible for reviewing the pertinent State Statutes involving the sales and use taxes and complying with all requirements. Rules and regulations of the Louisiana Department of Revenue shall prevail over any conflicting provisions or specifications of the

Contract.

25. REQUIRED DISCLOSURE

25.1 At its sole discretion the Owner may reject any Bidder the Owner finds to lack, or whose present or former executive employees, officers, directors, stockholders, partners, or Owners are found by the Owner to lack, honesty, integrity, or moral responsibility. The discretion of the Owner may be exercised based on the disclosure required herein. By submitting a Bid, Bidder recognizes and accepts that the Owner may reject the Bid based upon the exercise of its sole discretion, and Bidder waives any claim it might have for damages or other relief resulting from the rejection of its bid based on these grounds.

25.2 In accordance with LA R.S. 38:2212(B)(3)(a) within ten (10) days of its bid submission the Bidder shall disclose all material facts pertaining to any felony conviction or any pending felony charges in the last three (3) years in Louisiana or any other state or the United States against (I) Bidder, (ii) any business entity related to or affiliated with Bidder, or (iii) any present or former executive employee, officer, director, stockholder, partner, or Owner of Bidder or of any such related or affiliated entity. This disclosure shall not apply to any person or entity which is only a stockholder, which person or entity owns twenty percent (20%) or less of the outstanding shares of the Bidder whose stock is publicly owned and traded.

25.3 The apparent, responsible low bidder is required by the State of Louisiana Public Bid Law to furnish the following information or documentation within ten (10) calendar days after the date bids are opened; Felony Conviction and E-Verification Affidavit (Section 00420) the Non-Collusion Affidavit (Section 00440). If the apparent low bidder does not submit the proper information or documentation as required by the bidding documents within the ten (10) calendar day period, such bidder shall be declared non-responsive, and the public entity shall award the bid to the next lowest bidder, and afford the next lowest 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 may continue such process until the public entity either determines the low bidder or rejects all bids.

26. PROTESTS

26.1 Owner is responsible for resolution of protests of contract award, claims, disputes, alleged patent infringements, alleged license fees, and other related procurement matters in accordance with sound business judgment and good administrative practice. The following procedures shall be used for this purpose:

26.1.1 Any party with a direct financial interest adversely affected by Owner's procurement decision shall file a protest under this Article or be barred further relief.

26.1.2 A protest must (a) be in writing (oral protests shall not be permitted); (b) adequately state the basis of the protest and the relief requested; and (c) be received by Owner within seven (7) calendar days from the date the basis of the protest was, or should have been, known.

26.1.3 Owner shall take action on protests within forty-five (45) calendar days of the receipt thereof. Owner may defer the protested procurement upon receipt of a procedurally

adequate protest, provided that, in any event, award of a contract or subcontract or procurement of a sub-item may be permitted, at the Owner's sole discretion, where it will not materially affect resolution of the protest.

26.1.4 A protest shall be limited to (a) issues arising from the procurement provisions of the Contract and (b) state or local law. No protest may be filed with respect to basic project design.

26.1.5 The Owner's Attorney will establish procedures for resolution of protests. The Owner will rely for resolution of the protest, on decisions issued under Louisiana law, as well as decisions issued by other states, Federal courts, the U.S. Comptroller General, or other Federal agencies with extensive procurement expertise if Louisiana law is not clearly established.

27. OSHA REQUIREMENTS

27.1 Successful bidder shall comply with all applicable OSHA requirements.

28. CONSTRUCTION UTILITIES

28.1 Electric power required by the Bidder shall be secured by the Bidder and through his own arrangement with a Utility Company, or by other means.

28.2 Any water needed by the Bidder during construction will be shall be secured by him through his own arrangements. All water withdrawn from City of Lake Charles fire hydrants shall be metered. The Contractor shall obtain the water meter from the City of Lake Charles Water Division. The Contractor shall be responsible for all deposits, meter, and consumption charges. There will be no direct payment for this water usage, water deposit, or fee.

28.3 All sanitary facilities required during construction shall be provided by the Bidder and made satisfactory to the Architect and Public Health Authorities.

29. QUANTITIES OF ESTIMATE

29.1 Wherever the estimated quantities of work to be done and materials to be furnished on a unit price basis under this contract are shown in any of the documents, including the bid form, and the right is expressly reserved, except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this contract, and such increase or diminution shall in no way vitiate this contract, nor shall any such increase or diminution give cause for claims or liability for damages.

29.2 Bidders must satisfy themselves of the accuracy of the estimated quantities in the bid schedule by examination of the site and review of the drawings and specifications including addenda. After bids have been submitted, the bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done.

30. STATE PREFERENCE

30.1 Preference shall be given in accordance with the prevailing Statutes under Title 38, as follows:

30.1.1 Preference is hereby given to materials, supplies, and provisions, produced,

manufactured or grown in Louisiana, quality being equal to articles offered by competitors outside of the State.

30.1.2 In the letting of contracts for public work by any entity, except contracts financed in whole or in part by contributors or loans from any agency of the United States government, preference shall be given to Louisiana resident Contractors over non-resident Contractors, in accordance with LA RS 38:2211 et seq.

30.1.3 Additionally, public works contracts shall comply with the City of Lake Charles Ordinance No. 7911 whereby no less than eighty percent (80%) of non-management persons employed and fulfilling public works contracts with the City of Lake Charles shall be residents of the State of Louisiana. Except for Public Works contracts that require specialized equipment or knowledge, including, but not limited to, pipe bursting and cured-in-place (CIPP) lining of underground stormwater or sewerage lines.

31. PRE-EMPLOYMENT DRUG SCREENING

31.1 The City of Lake Charles has passed Ordinance No. 12943 amending the Code of Ordinances requiring language regarding pre-employment drug screen tests to be added to all City of Lake Charles' advertisement for bids on building and construction projects.

31.1.1 By submittal of this bid proposal, Contractor hereby certifies that has in place and employs a pre-employment drug screen test for each employee of the Contractor and administers periodic, random drug screen testing for each such employee and agrees that it will not enter into any Subcontractor agreement, whether verbal or written, unless said Subcontractor has in place and employs pre-employment drug screen testing and periodic, random drug screen testing. All such pre-employment drug screen testing and random testing shall meet or exceed the standards of drug screen testing as promulgated by the Associated General Contractors of Louisiana.

32. TITLE VI OF THE CIVIL RIGHTS ACT OF 1964

32.1 Title VI Notice

32.1.1 The City of Lake Charles fully complies with Title VI of the Civil Rights Act of 1964, Americans with Disabilities Act, and related statutes, executive orders, and regulations in all programs and activities. The City operates without regard to race, color, national origin, income, gender, age, and disability. Any person who believes him/herself or any specific class of persons, to be subjected to discrimination prohibited by Title VI/Americans with Disabilities Act may by him/herself or by representative file a written complaint with the City of Lake Charles. The City's Title VI Coordinator/ADA Coordinator may be reached by phone at (337) 491-1440, the Mayor's Action Line at (337) 491-1346, contacting the appropriate Department Head, or see the City of Lake Charles' website at www.cityoflakecharles.com. A complaint must be filed no later than 180 days after the date of the alleged discrimination has occurred.

32.1.2 City of Lake Charles meetings are conducted in accessible locations and materials can be provided in accessible formats. If you would like accessibility or language accommodation, please contact the Title VI Coordinator at (337) 491-1440 (phone) or (337) 491-1437 (fax) or the Mayor's Action Line at (337) 491-1346.

33. CITY OF LAKE CHARLES SMALL BUSINESS OPPORTUNITY PROGRAM (SBOP)

33.1 The City has gone on record to encourage general Contractors to provide opportunities for small businesses owned and operated by socially or economically disadvantaged persons to become involved as Subcontractors. To that end, the City requires all general Contractors to make good faith efforts to award at least 25 percent of the funds to be spent on their subcontracted work, in all City funded projects that are subject to the Louisiana public bid laws, to small businesses owned and operated by socially or economically disadvantaged persons as defined in Section 2-28(h) in the City of Lake Charles Code of Ordinances.

33.2 Those Contractors who actually have accomplished the goal of awarding 25 percent as set forth in section 2 above shall be entitled to a discount on the payment of the building permit fee associated with the project in an amount of ten percent with a maximum of $2,000.00.

33.3 Small Business Opportunity Program Reporting Requirements

33.3.1 In accordance with Section 2-33 of the City of Lake Charles Code of Ordinances, the apparent low Prime Bidder is required to submit a completed City of Lake Charles SBOP Good Faith Compliance Form (Section 00430) within ten (10) days following the bid opening. Nothing herein shall be deemed to require that the General Contractor accept the bid of any Subcontractor.

NOTE: This form is in addition to the Subcontractors List (Section 00435) which is also to be submitted within 10 days of the bid opening.

34. GUIDANCE CONCERNING GOOD FAITH EFFORTS

34.1 Prime Bidders must have exerted efforts that were of an intense, aggressive, and sincere nature that goes far beyond any simple paperwork exercise to demonstrate a good faith effort in achieving the project goal. The most recent list of Disadvantaged Small Business Enterprises (DSBE) can be found under the Business tab at www.cityoflakecharles.com. Prime Bidders will take necessary affirmative effort steps to assure that Disadvantaged Small Business Enterprises are used when possible. Affirmative effort steps shall include:

34.1.1 Placing certified Disadvantaged Small Business Enterprises on solicitation lists;

34.1.2 Assuring that Disadvantaged Small Business Enterprises are solicited whenever they are potential sources;

34.1.3 Dividing the work, when economically feasible, into smaller tasks or quantities to permit maximum participation by Disadvantaged Small Business Enterprises;

34.1.4 Establishing delivery schedules, where the requirement permits, which encourages participation by Disadvantaged Small Business Enterprises;

34.1.5 Using the services and assistance of the Small Business Administration, and the Minority Business Development Agency of the Department of Commerce;

34.1.6 Requiring the prime Contractor, if subcontracts are to be let, to take the affirmative effort steps listed in this section;

34.1.7 Attending any pre-bid meetings at which DSBE's could be informed of contracting and subcontracting opportunities;

34.1.8 Advertising in general circulation, trade association, and disadvantaged focused media

concerning the subcontracting opportunities;

34.1.9 Providing written notice to all certified DSBE's who have capabilities pertinent to the work of the contract that their interest in the contract is being solicited. This notice shall be in sufficient time to allow the DSBE's to respond to the written solicitation;

34.1.10 Following up initial solicitations of interest by contacting DSBE's to determine with certainty if the DSBE's are interested;

34.1.11 Providing interested DSBE's with adequate information about the plans, specifications, and requirements of the contract;

34.1.12 Negotiating in good faith with interested DSBE's. The evidence of such negotiations should include the names, addresses, and telephone numbers of DSBE's that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and a statement as to why additional agreements could not be reached for DSBE's to perform the work;

34.1.13 Not rejecting DSBE's as unqualified without sound reasons based on thorough investigation of their capabilities;

34.1.14 Making efforts to assist interested DSBE's in obtaining bonding, lines of credit, or insuring as required by the recipient or Contractor;

34.1.15 Making efforts to assist interested DSBE's in obtaining necessary equipment, supplies, materials, or other related services; and

34.1.16 Effectively using the services of available community organizations; disadvantaged Contractors' groups; local, state, and federal Disadvantaged Small Business Enterprise assistance offices; and other organizations as allowed on a case by case basis to provide assistance in the recruitment and placement of DSBE's.

END OF SECTION

SECTION 00300
LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: City of Lake Charles
Office of the Clerk of Council, City Hall, 4th Floor
326 Pujo St.
Lake Charles, LA 70601
(BIDEXPRESS.COM TO SEND AN ELECTRONIC BID)

BID FOR: City of Lake Charles, Louisiana
Lake Charles Event Center Green Rooms

Capital Project Number CP 3507

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:

Grace Design Studios LLC and dated: April 10, 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 ($ _____)

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 *(East and West Restroom / Shower & Dressing Room Renovation)* for the lump sum of:

_____ Dollars ($ _____)

Alternate No. 2 *(Lockers with Curtain System Added to the Alternate No. 1 Scope)* for the lump sum of:

_____ Dollars ($ _____)

Alternate No. 3 *(South Restroom, Showers, Dressing Rooms and Lounges)* for the lump sum of:

_____ Dollars ($ _____)

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 FOLLOWING ITEMS ARE TO BE INCLUDED WITH THE SUBMISSION OF THIS LOUISIANA UNIFORM PUBLIC WORK BID FORM

* 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.

** **A CORPORATE RESOLUTION OR WRITTEN EVIDENCE** of the authority of the person signing the bid for the public work as prescribed by LA R.S. 38:2212(B)(5).

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.

SECTION 00410

BID BOND

(For a paper bid, one original required of all Bidders with Power of Attorney attached. For an electronic bid, an electronic bid bond will still be accepted if received prior to the bid opening)

KNOW ALL MEN BY THESE PRESENTS, that we, _____ as PRINCIPAL, and _____ as Surety, are hereby held and firmly bound unto the CITY OF LAKE CHARLES, LOUISIANA, as OWNER in the penal sum of DOLLARS ($_____) for the payment of which sum well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed this _____ day of _____, 20_____.

The Condition of the above obligation is such that whereas the PRINCIPAL has submitted to the CITY OF LAKE CHARLES, LOUISIANA, a Bid, attached hereto and hereby made a part thereof, to enter into a contract in writing, for the construction of the following project:
Lake Charles Event Center Green Rooms, Capital Project No. CP 3507.

NOW THEREFORE,

a. If said Bid shall be rejected, or

b. If said Bid shall be accepted and the PRINCIPAL shall execute and deliver a contract in the Form of Agreement attachment hereto (properly completed in accordance with said Bid) and shall furnish a Bond for faithful performance of said contract, and for the payment of all persons performing labor and furnishing materials in connection therewith, and shall in all other respects perform the Agreement created by the acceptance of said Bid, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its Bond shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such Bid; and said Surety does hereby waive notice of any such extensions.

IN WITNESS WHEREOF, the PRINCIPAL and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

PRINCIPAL (BIDDER)	SURETY
ADDRESS: _____	ADDRESS: _____
_____	_____
BY: _____	BY: _____
AUTHORIZED OFFICER-OWNER-PARTNER	AGENT OR ATTORNEY-IN-FACT (SEAL)
TITLE: _____	TITLE: _____
SIGNATURE: _____	SIGNATURE: _____
WITNESS _____	WITNESS _____

IMPORTANT: Bid Guaranty Bonds: In accordance with LA R.S. 38:2218.C, all Bid Guaranty Bonds shall be written by a surety or insurance agency currently on the U.S. Department of Treasury Financial Management Service list of approved companies, 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 bonds either domiciled in Louisiana or owned by Louisiana residents.

SECTION 00420

FELONY CONVICTION AND EMPLOYEE VERIFICATION AFFIDAVIT

This document must be executed and furnished by the **lowest responsive bidder** no later than ten (10) calendar days after the Bid Opening. Failure to submit within the specified timeframe will result in the bidder being declared as non-responsive.

Name of Project: Lake Charles Event Center Green Rooms, Capital Project No. CP 3507

By signing this document in accordance with LA R.S. 38:2227, the appearer, as a bidder on the above project, does hereby attest that:

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 (LA R.S. 14:118)

(b) Corrupt influencing (LAR.S. 14:120)

(c) Extortion (LA R.S. 14:66)

(d) Money laundering (LA R.S. 14:23)

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 (LA R.S. 14:67)

(b) Identity Theft (LA R.S. 14:67.16)

(c) Theft of a business record (LA R.S. 14:67.20)

(d) False accounting (LA R.S. 14:70)

(e) Issuing worthless checks (LA R.S. 14:71)

(f) Bank fraud (LA R.S. 14:71.1)

(g) Forgery (LA R.S. 14:72)

(h) Contractors; misapplication of payments (LA R.S. 14:202)

(i) Malfeasance in office (LA R.S. 14:134)

By signing this document in accordance with LA R.S. 38:2212.10, the appearer, as a bidder on the above project, does hereby attest that:

A. The private employer is registered and participates in a status verification system (E-Verify) to verify that all employees in the State of Louisiana are legal citizens of the United States or are legal aliens.

B. The private employer 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. The private employer shall require all Subcontractors to submit to the employer a sworn affidavit verifying compliance with Paragraphs (A) and (B) of this Subsection.

If evidence is submitted substantiating that a false attestation has been made and the project must be readvertised or the contract cancelled, the awarded entity making false attestation shall be responsible to the public entity for the cost of rebidding, additional costs due to increased cost of bids and any and all delay costs due to the rebid or cancellation of the contract.

_____ _____

NAME OF BIDDER **NAME OF AUTHORIZED SIGNATORY OF BIDDER**

_____ _____

DATE **TITLE OF AUTHORIZED SIGNATORY OF BIDDER**

_____

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER

Subscribed and sworn to before me WITNESSES

This _____ day of _____, 20 _____ _____

_____ _____

(NOTARY PUBLIC)

My commission expires _____ SEAL

END OF SECTION

SECTION 00425

AFFIDAVIT OF COMPLIANCE WITH CLEAN AIR ACT AND WATER POLLUTION ACT

This document must be executed and furnished by the **lowest responsive Bidder** no later than ten (10) calendar days after the Bid Opening. Failure to submit within the specified timeframe will result in the Bidder being declared as non-responsive.

STATE OF LOUISIANA

PARISH OF CALCASIEU

BE IT KNOWN _____being first duly
(Name of Authorized Representative of Bidder)

sworn, deposes and says that:

(1) He is the_____, of _____,
(Title) (Firm Name)

the Bidder, that has submitted the accompanying Bid for the Construction of the

Lake Charles Event Center Green Rooms, Capital Project No. CP 3507,
(Project Name)

, a public project of the City of Lake Charles, Louisiana;

(2) He certifies that he will comply with all of the requirements of Section 114 of the Clean Air Act, as amended (42 U.S.C. 1857 et. seq.) and Section 308 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1318), relating to inspection, monitoring, entry, reports, and information, as well as all requirements, regulations, and/or guidelines issued under the above Sections;

(3) He further certifies that he nor any of his non-exempt subcontractors will not use any facility in the performance of any non-exempt Contract which is listed on the List of Violating Facilities issued by the Environmental Protection Agency;

(4) He further agrees that prompt notice will be given to the Agency or Agencies involved in this Contract of any notification received from the Director, Office of Federal Activities, Environmental Protection Agency, indicating that any facility utilized or to be utilized for this Contract is under consideration to be listed on the Environmental Protection Agency List of Violating Facilities; and

(5) He further agrees to include or cause to be included the criteria and requirements of paragraphs 2 through 4 of this Section in every non-exempt subcontract and

further that he will take such action as the proper Agency may direct as a means of enforcing such provisions.

WITNESSES: **BIDDER:**

_____ **BY:** _____

_____ **TITLE:** _____

Subscribed and sworn to before me

This _____ day of _____, 20 ____

_____
(NOTARY PUBLIC)

My commission expires _____ SEAL

END OF SECTION

SECTION 00430

CITY OF LAKE CHARLES SMALL BUSINESS OPPORTUNITY PROGRAM (SBOP)
GOOD FAITH COMPLIANCE FORM

This form is to be submitted by the lowest responsive Bidder within 10 days of bid opening. All Good Faith Effort forms **MUST BE COMPLETE AND IN COMPLIANCE** by the 10th day **IN ORDER FOR THE BID TO BE CONSIDERED RESPONSIVE.** Bid Opening Day counts as Day 1.

Project No: 3507

Project Title: Lake Charles Event Center Green Rooms, Capital Project No CP 3507

The total amount of subcontracted work for this project is valued at approximately $_____

which is approximately _____% of the total project.

BIDDER (FIRM): _____

Contact Person: _____ Telephone: _____

Address: _____ City: _____

State _____ Zip _____ E-Mail: _____

By: _____, _____ _____/_____/_____
(Signature) (Title) (Date)

The City of Lake Charles has gone on record to encourage general Contractors to provide opportunities for disadvantaged small business enterprises (DSBE) to become involved as Subcontractors as specifically stated in City Ordinance Section 2-33. Accordingly, this form is required of the lowest responsive Bidder to document his or her specific plan to provide such opportunities.

The City requires all general Contractors to make good faith efforts to award at least 25% of their subcontracted work in all City funded projects to DSBE.

If the lowest responsive Bidder does not plan to provide DSBE opportunities on this project, please explain why.

_____

_____

_____

If the lowest responsive Bidder plans to provide DSBE opportunities on this project, please list on the following page(s).

1. The lowest responsive Bidder plans to engage the following DSBE firm as a Subcontractor

Name of DSBE Firm: _____

DSBE Firm Owner or Contact: _____

Telephone: _____ **Fax:** _____ **E-Mail:** _____

SCOPE OF WORK: Describe the work to be performed by the DSBE firm.

_____

_____

The estimated dollar value of the scope of work is $_____ which is approximately _____% of the amount to be spent on subcontracted work for this project.

DSBE AFFIRMATION
The above-named DSBE affirms that it can perform the scope of work required in a thorough and competent manner to the satisfaction of the lowest responsive Bidder and as per the specifications for the estimated dollar value as stated above.

By: _____ , _____, _____/_____/_____
(Signature) (Title) (Date)

2. The lowest responsive Bidder plans to engage the following DSBE firm as a Subcontractor

Name of DSBE Firm: _____

DSBE Firm Owner or Contact: _____

Telephone: _____ **Fax:** _____ **E-Mail:** _____

SCOPE OF WORK: Describe the work to be performed by the DSBE firm.

_____

_____

The estimated dollar value of the scope of work is $_____ which is approximately _____% of the amount to be spent on subcontracted work for this project.

DSBE AFFIRMATION
The above-named DSBE affirms that it can perform the scope of work required in a thorough and competent manner to the satisfaction of the lowest responsive Bidder and as per the specifications for the estimated dollar value as stated above.

By: _____, _____, _____/_____/_____
(Signature) (Title) (Date)

If more space is needed, please make more copies of this page.
The City of Lake Charles considers the actions listed below evidence of the good faith efforts to award at least 25% of their subcontracted work to DSBE. **Please mark appropriate boxes.**

YES	NO	EVIDENCE OF GOOD FAITH EFFORTS
		PRE-BID MEETING(S): The bidder attended the pre-bid meeting if held.
		SMALL CONTRACT(S): The bidder selected specific portions of the work to be performed by DSBE firms in order to increase the likelihood of meeting the SBOP goals (including breaking down contracts into smaller units to facilitate DSBE participation).
		SBOP LIST(S): The bidder utilized the City's Small Business and Disadvantaged Small Business Enterprise List or lists of certified DSBE firms found at www.cityoflakecharles.com.
		FOLLOW-UP: The bidder followed-up initial indications of interest by DSBE firms by contacting those DSBE firms to determine with certainty if they remained interested in bidding.
		ADVERTISEMENT: The bidder advertised in general circulation, public journals, and/or trade association publications concerning subcontracting opportunities, and allowed DSBE firms reasonable time to respond.
		GOOD FAITH NEGOTIATIONS: The bidder negotiated in good faith with interested DSBE firms and did not reject DSBE firms as unqualified without sound business reasons based on a thorough investigation of their capabilities.
		INFORMATION: The bidder provided interested DSBE firms with adequate information about the plans, specifications, and requirements of the subcontract.
		WRITTEN NOTICE(S): The bidder took the necessary steps to provide written notice in a manner reasonably calculated to inform DSBE firms of subcontracting opportunities and allowed sufficient time for them to participate effectively.
		COMMUNITY RESOURCES: The bidder used the services of the City's SBOP office, available community organizations, small and/or disadvantaged business assistance offices and other organizations that provide assistance in the recruitment and placement of DSBE firms.
		CONTRACT RECORDS: The bidder has maintained the following records for each DSBE firm that has made bid on the subcontracting opportunity: 1. Name, address, and telephone number; 2. A description of information provided by the bidder or Subcontractor; and 3. A statement of whether an agreement was reached, and if not, why not, including any reasons for concluding that the DSBE was unqualified to perform the job.

Please list the DSBE contacts made and the results of said contact.

Name of DSBE Firm: _____

DSBE Firm Owner or Contact:_____

Telephone: _____ **E-Mail: _____**

Type of work solicited for this project:

_____

Results of Bidder's contact with the DSBE firm:

_____

SBOP Office Use Only:

_____

Name of DSBE Firm: _____

DSBE Firm Owner or Contact: _____

Telephone: _____ **E-Mail:** _____

Type of work solicited for this project:

_____

Results of Bidder's contact with the DSBE firm:

_____

SBOP Office Use Only:

_____

_____

Name of DSBE Firm: _____

DSBE Firm Owner or Contact: _____

Telephone: _____ **E-Mail:** _____

Type of work solicited for this project:

_____

Results of Bidder's contact with the DSBE firm:

_____

SBOP Office Use Only:

_____

_____

Name of DSBE Firm: _____

DSBE Firm Owner or Contact: _____

Telephone: _____ **E-Mail:** _____

Type of work solicited for this project:

_____

Results of Bidder's contact with the DSBE firm:

_____

SBOP Office Use Only:

_____

_____

If more space is needed, please make more copies of this page.

SECTION 00435

SUBCONTRACTOR LIST
(Required from Apparent Low Bidder within 10 Days of Receipt of Bids)

Capital Project No.: **CP3507**

In accordance with Ordinance No. 12743 of the City of Lake Charles, Louisiana, the following is a list of Subcontractors proposed to be used on above listed Project or Capital Project No., including the category or scope of work, which each Subcontractor will be performing. Any disadvantaged small business enterprise (DSBE) should be identified as such next to their name. *If no Subcontractors are to be used on this project, the bidder shall so indicate by insertion of the phrase* ***"No Subcontractors will be used on this project"*** *written or typed across this submittal.*

The Contractor will be required to use all Subcontractors listed on this form in the identified scope of work. Listing Subcontractors with a duplicate category or scope of work will not be permitted.

The obligation to submit the names of Subcontractors on the Subcontractor's Submittal form is not applicable for subcontracts amounting to less than Five Thousand Dollars ($5,000.00), or less than one percent (1%) of the total amount bid.

SUB'S NAME, ADDRESS AND TELEPHONE	***CATEGORY OR SCOPE OF WORK***
1)	
2)	
3)	
4)	

Signed: _____ Title: _____

SECTION 00440

NON-COLLUSION AFFIDAVIT

This document must be executed and furnished by the **lowest responsive Bidder** no later than ten (10) calendar days after the Bid Opening. Failure to submit within the specified timeframe will result in the Bidder being declared as non-responsive.

STATE OF LOUISIANA

PARISH OF CALCASIEU

BE IT KNOWN _____being first duly
(Name of Authorized Representative of Bidder)

sworn, deposes and says that:

(1) He is the_____, of _____,
(Title) (Firm Name)

the Bidder, that has submitted the accompanying Bid for the Construction of the

Lake Charles Event Center Green Rooms, Capital Project No CP 3507,
(Project Name)

, a public project of the City of Lake Charles, Louisiana;

(2) He is fully informed respecting the preparation and contents of the Bid and of all pertinent circumstances respecting the Bid;

(3) The Bid is genuine and is not a collusive or sham Bid;

(4) Neither the said Bidder nor any of its officers, partners, Owners, agents, representatives, employees or parties in interest, including this affiant, have in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other Bidder, firm, or person to submit a collusive or sham Bid in connection with the Contract or Work for which the attached Bid has been submitted; or to refrain from bidding in connection with such Work; or have in any manner, directly or indirectly, sought by agreement, collusion, communication or conference with any Bidder, firm, or person to fix the price or prices in the Bid or the Bid of any other Bidder; or to fix any overhead, profit, or cost elements of the Bid price or the Bid price of any other Bidder; or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against the Owner, or any person interested in the proposed Work;

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or

any other of its agents, representatives, Owners, employees, or parties in interest, including this affidavit;

(6) That he has employed no one person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he is to receive payment, other than persons regularly employed by him whose services in connection with the construction of the public building or project or in securing the public contract were in the regular course of their duties for him; and that no part of the contract price to be received by him as 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 him whose services in connection with the construction of the public building or project were in the regular course of their duties for him;

APPEARER FURTHER DECLARES that they will, in all respects, comply with the public contract laws of the State of Louisiana, including Title 38 of the Louisiana Statutes, and particularly Section 2224, as amended, of such Title 38 of the Louisiana Revised Statutes.

WITNESSES: **BIDDER:**

_____ **BY:** _____

_____ **TITLE:** _____

Subscribed and sworn to before me

This _____ day of _____, 20 ____

_____
(NOTARY PUBLIC)

My commission expires _____ SEAL

END OF SECTION

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

City of Lake Charles (LA)
Legal Name of Governmental Entity

, an agency of the United 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 Emily K. McDaniel, Director of Finance		
Name of Governmental Entity City of Lake Charles		
Address 326 Pujo Street, 6th Floor		
City Lake Charles	State LA	ZIP 70601

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.

SECTION 00450

CITY OF LAKE CHARLES NOTICE OF AWARD

Project: Lake Charles Event Center Green Rooms, Capital Project No CP3507	
Owner: City of Lake Charles, LA	Owner's Contract No.: CP3507
Architect: Grace Design Studios LLC	Architect's Project No.: 4024119
Bidder:	
Bidder's Address:	

You are notified that your Bid dated _____ for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for _____

[Indicate total Work, alternates, or sections of Work awarded.]

The Contract Price of your Contract is _____ Dollars ($_____).

PDF or Hard copies of the proposed Contract Documents (except Technical Specifications and Drawings) accompany this Notice of Award.

Three (3) sets of the Drawings and Specifications will be delivered separately or otherwise made available to you with, or prior to, your Notice to Proceed.

You must comply with the following conditions precedent within fifteen (15) working days of the date you receive this Notice of Award.

1. Deliver to the Architect seven (7) fully executed counterparts of ALL Contract Documents signed in ink.
2. Executed the Agreement and the Surety Bonds as specified in Article 19 of the Instructions to Bidders and Article 11 of the General Conditions.
3. Other conditions precedent:
   Insurance Certificate per the General Conditions and Other Required Documents per Specifications Including but May Not be Limited to the following:

   - Section 00485 Corporate Resolution (When Applicable)
   - Section 00500 Agreement (DO NOT DATE)
   - Section 00610 Contractor's Performance Bond (DO NOT DATE)
   - Section 00615 Contractor's Payment Bond (DO NOT DATE)
   - Provide Certifications of Insurance as specified (Article 11 of the General Conditions)

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within fifteen (15) calendar days after you comply with the above conditions, the Owner will return to you one fully executed counterpart of the Contract Documents.

City of Lake Charles, Louisiana
Owner

By: _____
Authorized Signature

_____
Title

_____
Date

SECTION 00485

CORPORATE RESOLUTION

Excerpt from minutes of meeting of the board of directors of _____

_____, incorporated.

At the meeting of directors of _____,

Incorporated, duly noticed and held on _____, 20____,

A quorum being there present, on motion duly made and seconded. It was:

Resolved that _____, be and is hereby appointed, constituted and designated as agent and attorney-in-fact of the corporation with full power and authority to act on behalf of this corporation in all negotiations, bidding, concerns and transactions with The City of Lake Charles or any of its agencies, departments, employees or agents, including but not limited to the execution of all bids, papers, documents, affidavits, bonds, sureties, contracts and acts and to receive and receipt therefor all purchase orders and notices issued pursuant to the provisions of any such bid or contract, this corporation hereby ratifying, approving, confirming and accepting each and every such act performed by said agent and attorney-in-fact.

I hereby certify the foregoing to be a true and correct copy of an excerpt of the minutes of the above dated meeting of the board of directors of said corporation, and the same has not be revoked or rescinded.

_____
SECRETARY-TREASURER

_____
DATE

END OF SECTION

SECTION 00500
AGREEMENT BETWEEN OWNER AND CONTRACTOR

THIS AGREEMENT is by and between the CITY OF LAKE CHARLES, LOUISIANA hereinafter called the OWNER, and _____, hereinafter called the CONTRACTOR.

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents for the Lake Charles Event Center Green Rooms, Capital Project No. 3507. The Work includes, but is not limited to:

- The Lake Charles Event Center Green Rooms project consisting of the renovation of a portion of the existing building at 900 Lakeshore Drive and adjacent site. The renovation consists of approximately 1,500 sf of interior renovations for the locker rooms and approximately 3,000 sf of addition for the green rooms. Selective site demolition scope includes but is not limited to paving and driveways, brick planters, knee wall, steps and railing, select bollards, mechanical equipment and pads, select wall and soffit mounted lights, wall select mounted devices, and chainlink gate. Selective building demolition scope includes but is not limited to demolition and removal of the existing walls, doors, frames, hardware, windows, toilet partitions, millwork, countertops, shelving, flooring, base, wall finishes, act ceilings, slab, lighting, and plumbing fixtures. Sitework includes but is not limited to new parking lot paving and new bollards. New exterior construction scope includes but is not limited to cold formed metal framed walls with continuous insulation, fluid applied vapor barrier, fire retardant plywood sheathing, prefinished metal wall panels, aluminum framed storefront system and glazing, modified bitumen roofing system, stairs with painted metal railings. New interior construction scope includes but is not limited to installation of new acoustic ceiling tile, linear wood ceiling planks, carpet, LVT, and sealed concrete flooring, painted gypsum board walls, millwork with plastic laminate and solid surface, porcelain tile walls and flooring, wall coverings, toilet partitions and accessories, lockers, and curtains. Project includes all associated MEP, structural, civil and landscape scope

ARTICLE 2. ARCHITECT

2.1 The Project has been designed by Grace Design Studios LLC who is hereinafter called ARCHITECT and who will assume all duties and responsibilities and have the rights and authority assigned to ARCHITECT in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

2.2 The Architect's Contact Information is as follows:
Alex Deshotels
Grace Design Studios LLC
501 Government Street, Suite 200
Baton Rouge, LA 70802
225-338-5569

ARTICLE 3. CONTRACT TIME

3.1 Time is of the Essence

A. All time limit Milestones, if any, Substantial Completion, and completion and readiness for final payments as stated in the Contract Documents are of the essence of the Contract.

3.2 Days to Achieve Substantial Completion and Final Acceptance

A. The CONTRACTOR shall be substantially complete with the Work within 270 calendar days after the date when the Contract Time commences to run as provided in Article 8 of the General Conditions of the Construction Contract (Section 00700), complete and ready for final acceptance in accordance with Section 9.10 of the General Conditions within 315 calendar days after the date when the Contract Time commences to run.

3.3 Liquidated Damages

A. OWNER and CONTRACTOR recognize that the OWNER will suffer direct financial loss if Work is not completed within the Contract times specified in Paragraph 3.2 above plus any extensions thereof allowed in accordance with Article 7 of the General Conditions, and therefore, time is of the essence. They also recognize the delays, expense, and difficulties involved in proving in a legal proceeding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, CONTRACTOR and Surety agree to forfeit and pay OWNER as liquidated damages for delay (but not as a penalty) the amount of $TBD based on Contract Value, see Instructions to Bidders Item 8.1 for each calendar day that expires after the Contract Time specified in Paragraph 3.2 for substantial completion until the Work is substantially complete; and $ TBD based on Contract Value, see Instructions to Bidders Item 8.1 for each calendar day that expires after the time specified in Paragraph 3.2 for final completion and ready for final acceptance until the Work is completed. These amounts represent a reasonable estimate of OWNER's expenses for extended delays and for inspection, architectural services, and administrative costs associated with such delay. This provision shall be effective between the parties ipso facto and without demand or putting in default, it being specifically agreed that the CONTRACTOR by his mere failure to complete the work on or before the date specified shall be deemed in default.

ARTICLE 4. CONTRACT PRICE

CONTRACT PRICE: The amount to be paid to the CONTRACTOR by the OWNER for completion of all work hereunder is:

_____ Dollars ($_____)

and all extra work in connection therewith, in accordance with the plans and specifications made part of this this Contract Document.

ARTICLE 5. PAYMENT PROCEDURES

5.1 Submittal and Processing of Payments

A. CONTRACTOR shall submit Applications for Payment in accordance with Article 9 of the General Conditions. Applications for Payment will be processed by ARCHITECT as provided in the General Conditions.

5.2 Progress Payments and Retainage

A. OWNER shall make progress payments which exceed $5,000 on account of the Contract price on the basis of CONTRACTOR's Applications for Payment, as recommended by ARCHITECT, on or about the thirtieth (30th) day following receipt by the OWNER. Applications for Payments less than $5,000 shall be accumulated until the next payment period or until final payment.

B. Progress payments will be based upon estimated quantities of completed contract unit price items or upon estimated percentages of completion of the schedule of lump sum values of labor and materials incorporated into the Work on the last day of each month or other mutually agreed regular monthly date ending the progress payment period.

C. Prior to final completion and acceptance of all Work covered by the Contract Documents, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as ARCHITECT may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Article 15 of the General Conditions. Retainage indicated below does not include withholdings for known incomplete work. Such withholdings are not included in calculating the retainage but are additional monies withheld:

1. For Contract Prices of $500,000 or less, 90% of Work completed and/or cost of materials and equipment not incorporated in the Work (with the balance of 10% being retainage).

2. For Contract Prices in excess of $500,000, 95% of Work completed and/or cost of materials and equipment not incorporated in the Work (with the balance of 5% being retainage).

D. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to CONTRACTOR to the applicable percent based on the preceding Paragraph 6.02.C of the Work completed, less such amounts as ARCHITECT shall determine in accordance with Paragraph 9.8 of the General Conditions and less the value of ARCHITECT’s estimate of the Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion. When substantial completion is granted by the OWNER, the Certificate of Substantial Completion is then filed with the Recorder of Mortgages of the City of Lake Charles. This begins the lien period which shall not be less than forty-five (45) days as prescribed for Public Works by Louisiana Revised Statutes 38:2242.

5.3 Final Acceptance and Final Payment

A. Upon the final completion of all Work, the CONTRACTOR may request a final inspection and may make a final Application for Payment as provided by Article 9.10 of the General Conditions, upon the OWNER's certificate of final acceptance.

B. At the expiration of the lien period it is the CONTRACTOR's responsibility to obtain a certificate from the Recorder of Mortgages of the City of Lake Charles that the Contract is clear of any liens or privileges, and said certificate shall be presented to the OWNER for final payment and release of retainage, less any such sums as may be lawfully withheld under the Contract.

ARTICLE 6. CONTRACTOR'S REPRESENTATIONS

6.1 In order to induce OWNER to enter into this Agreement, CONTRACTOR makes the following representations:

A. CONTRACTOR has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

B. CONTRACTOR has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. CONTRACTOR is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. CONTRACTOR has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any, that have been identified in containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in as containing reliable "technical data."

E. CONTRACTOR has considered the information known to CONTRACTOR; information commonly known to CONTRACTORs doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) CONTRACTOR’s safety precautions and programs.

F. Based on the information and observations referred to in Paragraph 6.1.D above, CONTRACTOR does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

G. CONTRACTOR is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

H. CONTRACTOR has given Architect written notice of all conflicts, errors, ambiguities, or discrepancies that CONTRACTOR has discovered in the Contract Documents, and the written resolution thereof by ARCHITECT is acceptable to CONTRACTOR.

I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work

ARTICLE 7. CONTRACT DOCUMENTS

7.1 The following Contract Documents, which comprise the entire Agreement between OWNER and CONTRACTOR, are all hereby made a part of that Agreement to the same extent as if incorporated herein in full:

A. This Agreement (Pages 00500-1 to 00500-9, inclusive).

B. CONTRACTOR'S Performance Bond (Pages 00610-1 to 00610-2, inclusive).

C. CONTRACTOR's Payment Bond (Pages 00615-1 to 00615-3, inclusive) and Insurance Certificates.

D. Addenda (Nos. _____through _____, inclusive).

E. Specifications and Drawings, as listed in the table of contents of the Project Manual and bearing the general title, "**Lake Charles Event Center Green Rooms, Capital Project No 3507**".

F. General Conditions (pages 00700-1 through 00700-65, inclusive).

G. Exhibits to this Agreement (enumerated as follows)

1. CONTRACTOR's Bid Form (Pages 00300- 1 to 00300- **X**, inclusive).
2. Felony Conviction and Employee Verification Affidavit (00420)
3. Affidavit of Compliance with Clean Air Act and Water Pollution Act (00425)
4. City of Lake Charles SBOP Good Faith Compliance Form (00430)
5. SubCONTRACTOR List (00435)
6. Non-Collusion Affidavit (00440)
7. Sales Tax Exemption Certificate (00445)
8. Corporate Resolution (00485)

H. The following may be delivered or issued on or after the Effective Date of the Agreement:

1. Notice to Proceed (00640)
2. Change Orders (00650)
3. Work Change Directives (00660)

4. Field Orders (00670)

7.2 There are no Contract Documents other than those listed above in this Article 7. The Contract may only be amended, modified or supplemented as provided in Article 7 of the General Conditions.

ARTICLE 8. MISCELLANEOUS

8.1 Terms

A. Terms used in this Agreement will have the meanings stated in the General Conditions.

8.2 Assignment of Contract

A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents. Notwithstanding the foregoing, the OWNER may assign this contract to the State of Louisiana or any political subdivision, municipality, special district or authority thereof without CONTRACTOR's consent and without recourse.

8.3 Successors and Assigns

A. Owner and CONTRACTOR each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

8.4 Severability

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

8.5 CONTRACTOR'S Certifications

A. CONTRACTOR certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.5:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.6 Remedies for Dispute Resolution

A. In the event of dispute arising between the parties, both parties shall have all rights granted by the general laws of The State of Louisiana. It is hereby further agreed upon and understood by the parties hereto that any and all disputes that may arise in litigation shall be litigated in the 14th Judicial District Court for the Parish of Calcasieu or United States District Court Western District of Louisiana if jurisdiction is proper.

8.7 Relationship between the parties

A. The CONTRACTOR is engaged by the Owner for the purposes set forth in this agreement. The relationship between the CONTRACTOR and the Owner shall be, and only be, that of an independent CONTRACTOR and the owner shall not be construed to be an employee, agent, partner of, or in joint venture with, the Owner.

8.8 Acknowledgement of Exclusion from Worker's Compensation Coverage

A. The OWNER and the CONTRACOR expressly agree that the CONTRACTOR is an independent CONTRACTOR as identified in R.S 23:1021(7) and, as such, expressly agree that the OWNER shall not be liable to the CONTRACTOR or to anyone employed by the CONTRACTOR for any benefits or coverage as provided by the Worker's Compensation Law of the State of Louisiana.

8.9 Acknowledgement of Exclusion from Unemployment Compensation Coverage

A. The OWNER and the CONTRACTOR expressly declare and acknowledge that the CONTRACTOR is an independent CONTRACTOR, as such, is being engaged by the OWNER under this agreement as noted and defined in R.S. 23:1472(12)(E) and, therefore, it is expressly declared and understood between the parties hereto, that for the purposes of unemployment compensation only:

1. The CONTRACTOR has been and will be free from any control or direction by the Owner over the performance of the services covered by this agreement;

2. The services to be rendered by the CONTRACTOR are outside the normal course and scope of the OWNER's usual business; and

3. The CONTRACTOR is customarily engaged in an independent established trade, occupation, profession, or business.

B. Consequently, neither the CONTRACTOR nor anyone employed or contracted by the CONTRACTOR shall be considered an employee of the Owner for the purpose of unemployment compensation coverage.

8.10 Employment of Owner Personnel

A. The CONTRACTOR certifies that it has not employed and will not employ any person to engage in the performance of this agreement who is, presently, or at the time of such employment, and employee of the OWNER.

8.11 Legal Compliance

A. The OWNER and CONTRACTOR shall comply with all federal, state, and local laws and regulations, including, specifically, the Louisiana Code of Governmental Ethics (R.S. 42:1101,*et seq.*) in carrying out the provisions of this agreement.

8.12 Covenants against Contingency Fees

A. The CONTRACTOR warrants that it has not employed or retained any entity or person, other than bona fide employees working solely for the CONTRACTOR, to solicit or secure this agreement, and that it has not paid or agreed to pay any entity or person, other than a bona fide employee working solely for the CONTRACTOR any fee, commission, percentage, brokerage fee, gift, or any other consideration, contingent upon or resulting from the award or making of this agreement. For breach or violation of this warranty, the Owner shall have the right to annul this agreement without liability or, in the OWNER's discretion, to deduct from the contract price or consideration, or otherwise recover the full amount of such fee, commission, percentage, brokerage fee, gift, or contingent fee.

8.13 Non-Discrimination Clause

A. The CONTRACTOR agrees to abide by the requirements of the following as applicable: Title VI and VII of the Civil Rights Act of 1964, as amended by the Equal Opportunity Act of 1972, Federal Executive Order 11246, the Federal Rehabilitation Act of 1973, as amended, the Vietnam Era Veteran's Readjustment Assistance Act of 1974, Title IX of the Education Amendments of 1972, as amended, the Age Act of 1975, as amended, and CONTRACTOR agrees to abide by the requirements of the American Disabilities Act of 1990, as amended. CONTRACTOR agrees not to discriminate in its employment practices, and will render services under this contract without regard to race, color, religion, sex, sexual orientation, national origin, veteran status, political affiliation, or disabilities. The CONTRACTOR acknowledges and agrees that any act of unlawful discrimination committed by the CONTRACTOR, or any other failure to comply with these statutory obligations when applicable shall be grounds for termination of this agreement.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement effective as of the date

first written above. All portions of the Contract Documents have been signed or have been identified by OWNER and CONTRACTOR on their behalf.

This Agreement will be effective on _____, _____ (which is the Effective Date of the Agreement).

OWNER:

_____

By: Honorable Mayor Marshall J. Simien, Jr.

Title: Mayor of the City of Lake Charles

⌈CORPORATE SEAL⌉

Attest: _____

Title: _____

Address for giving notices:

P.O. Box 900

Lake Charles, Louisiana 70602-0900

(If OWNER is a corporation, attach evidence of authority to sign. If OWNER is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

Designated Representative:

Name: Honorable Mayor Marshall J. Simien, Jr.

Title: Mayor of the City of Lake Charles

Address: P.O. Box 900

Lake Charles, LA 70602-0900

Phone: (337) 491-1201

CONTRACTOR

_____

By: _____

Title: _____

⌈CORPORATE SEAL⌉

Attest: _____

Title: _____

Address for giving notices:

_____

_____

_____

License No.: _____
(Where applicable)

Agent for Service or process:

_____

(If CONTRACTOR is a corporation or a partnership, attach evidence of authority to sign.)

Designated Representative:

Name: _____

Title: _____

Address: _____

_____

Phone: _____

E-mail: _____

END OF SECTION

a. Submit certificates that are listed on one of the following websites:
1) https://spot.ul.com/.
2) https://sustainabilitydirectory.intertek.com/home.
3. Detailed description of equipment anchorage devices on which the certification is based, and their installation requirements.

B. Product Test Reports: For each air Cleaner, for tests performed by a qualified testing agency.

C. Field quality-control reports.

1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit operation and maintenance data and recommended spare parts lists. Include 10 years of operations and energy costs.

B. Warranty Certificate

1.06 QUALITY ASSURANCE

A. Testing Agency Qualifications: An NRTL.

B. Manufacturer Qualifications: Company that specializes in manufacturing products specified in this section.
1. ISO 9001-compliant manufacturing process.
2. ISO 9001: 2015-compliant administrative processes.
3. Documented Experience: 10 years, minimum.
4. Furnish services of manufacturer's qualified representative to inspect finished air ionization system.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery: In factory-fabricated shipping containers.
1. Identify product type and installation location on outside of container.
2. Do not crush or bend product packaging.

B. Storage: In original packaging. Protect products from weather and construction work traffic.
1. Store products indoors, and in accordance with manufacturer's written storage instructions.

1.08 WARRANTY

A. Furnish equipment having manufacturer's warranty against defects in material and workmanship for a period of three years after date of shipment.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. ASHRAE Compliance:
1. Comply with applicable requirements in ASHRAE 62.1, Section 4 "Outdoor Air Quality", Section 5 "Systems and Equipment", and Section 7 "Construction and Startup."

2.02 CAPACITIES AND CHARACTERISTICS

A. Provide NPBI Air cleaning system at locations on Drawings

B. Maximum Ozone Emissions: In accordance with limits stated in UL 2998.
1. Products not certified in accordance with UL 2998 are unacceptable.
2. Provide products listed on UL SPOT or Intertek Sustainability product database(s) as UL 2998-compliant. Products not listed in either database are unacceptable. Submit manufacturer's test report showing compliance with UL 2998.

C. Humidity: Provide ionization devices:
1. That do not require preheat protection when relative humidity of entering air exceeds 85 percent.
2. That are suitable for relative humidity from zero to 100 percent, condensing, without causing damage, deterioration, or dangerous conditions within air ionization system.

D. Ionization Requirements
   1. Ionization Output: Provide systems that produce positive and negative ions. Unipolar ionization devices are unacceptable.
   2. Ionization Device Enclosures: Provide corrosion-resistant, non-metallic materials. Configure enclosure without thermal bridging.
   3. Provide integral alarm dry contacts, SPST (NO), rated 1.0 A at 250 V ac.
   4. Mounting: Magnets or self-tapping sheet metal screws.

E. Design Requirements for Non-Coil Cleaning Installations:
   1. Provide ionization units having manufacturer's recommended number of electrodes and power generators, sized to system air flow.
   2. NPBI Electrodes:
      a. Materials: Carbon fiber clusters having minimum 45000 needles each.
         1) Metal electrodes are unacceptable.
         2) Bipolar ionization tubes manufactured of glass, composite, mica, or similar dielectric materials are unacceptable.
      b. Energize ionization system continuously.
      c. Multi-Voltage Input: 24 V to 240 V ac or dc.

F. Control Requirements:
   1. NPBI Devices:
      a. Internal short-circuit protection.
      b. Overload protection.
      c. Automatic fault reset circuit breakers. Units having fuses are unacceptable.
      d. Provide integral alarm dry contacts, SPST (NO), rated 1.0 A at 250 V ac.
   2. Ionization Output: Provide unit that varies ion output in proportion to airflow velocity.

2.03 AUTO-CLEANING - DC VOLTAGE OUTPUT

A. Description: Auto-cleaning NPBI device for duct or unit mounting.
   1. Basis-of-Design: Product for Constant Volume Systems: Subject to compliance with requirements, provide GPS Air; Model GPS-DM48-AC, or comparable product.
   2. Capacity and Characteristics:
      a. Materials: Nonmetallic composite with carbon fiber ion emitters.
      b. Capacity: 0 to 4800 cfm (136 cu. m/minute).
      c. Provide integral alarm dry contacts, SPST (NO), rated 1.0 A at 250 V ac.
      d. Provide programmable auto-cleaning cycle.
      e. Temperature Range: Minus 20 to plus 140 degrees Fahrenheit.
      f. Relative Humidity Range: Zero to 100 percent.
      g. Power Entry: UL listed, line cord, in conduit.
      h. Emitter Dimensions:
         1) Diameter for Duct Penetration: 3.75 inches.
         2) Duct Insertion Length: 5.25 inches.
         3) Overall Unit Diameter: 6.5 inches.
         4) Overall Unit Length: 7.5 inches.
      i. Ionizer Unit Weight: 2.31 lb (1050 g).
   3. Electrical Characteristics:
      a. Electrical Listings: UL, cUL.
      b. Compliance and Certifications: CARB, CE, FCC Part 18, UL 867, UL 2043, UL 2998.
      c. Input Voltage: 24 V dc, 50 Hz.
      d. Power Consumption: 8 W, operating; 12 W, cleaning.
      e. Output Power: 2 kV RMS, plus or minus 10 percent.
      f. Total Ion Output: Minimum 400 million ions/cc, measured 1 inch from carbon fiber brushes.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine electronic air cleaners and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Mount and wire devices at locations indicated on Drawings.

B. Install devices in accordance with manufacturer's written instructions.

C. Electrical Requirements: Wiring, conduit, and junction boxes.
   1. Install within housing plenums in accordance with NFPA 70.

D. Position each electronic air cleaner unit with clearance for service and maintenance. Anchor electronic air cleaners to substrate.

E. NPBI Systems:
   1. Prior to Owner acceptance, remove damaged or failed components from site and replace with new components at no cost additional cost.
   2. Protect components from dust and damage from time of installation until Owner acceptance.

F. Do not operate fan system until electronic air cleaners and associated prefilters and final filters are in place.
   1. Replace temporary filters used during construction and testing with new, clean filters.

G. Operate electronic air cleaners for 24 hours as part of startup before ventilations systems are put into operation.

H. Coordinate electronic air cleaner and associated prefilter and final filter installations with duct and air-handling-unit installations.

3.03 INSTALLATION, AUTO-CLEANING – DC VOLTAGE OUTPUT

A. Product: GPS-DM48-AC, NPBI Auto-Cleaning Air Ionization System.
   1. Install air ionization system in supply duct of a Constant Volume System.
      a. Do not install air ionization system upstream from unit filter.
   2. Mechanical Installation:
      a. Install ionization emitter perpendicular to air flow direction. Mount so ion emitters are exposed to, and perpendicular to airstream. Mount ion emitters so airflow passes between them.

3.04 CONTROL WIRE, CABLE AND RACEWAYS INSTALLATION

A. Comply with NECA 1.

B. Wire and Cable Installation:
   1. Comply with installation requirements in Section 260523 "Control-Voltage Electrical Power Cables."
   2. Comply with installation requirements in Section 271313 "Communications Copper Backbone Cabling."
   3. Comply with installation requirements in Section 271513 "Communications Copper Horizontal Cabling."
   4. Install cables with waterproof protective sheathing capable of withstanding continuous temperatures of 194 degrees Fahrenheit with no measurable effect on physical and electrical properties of cable.
      a. Provide shielded twisted pair cable. Connect shield at one end. Tape back and insulate shield at opposite end.
   5. Terminate Wiring in Junction Box.
      a. Clamp cable over jacket in junction box.

b. Install individual conductors in stripped section to have slack between clamping point and terminal block.

6. Terminate field wiring and cable not directly connected to instruments and control devices having integral wiring terminals using terminal blocks.
7. Install signal transmission components in accordance with IEEE C2, REA Form 511a, NFPA 70, and as otherwise indicated.
8. Perform continuity and megger testing on wire and cable after installation.
   a. Remove cable that fails testing from site and replace with new.
   b. Do not repair or splice cable between termination points.

C. Conduit Installation:
   1. Comply with electrical specifications for conduit installation.

3.05 FIELD QUALITY CONTROL

A. Field Inspection: Coordinate field inspection in accordance with "Quality Assurance" Article in this Section and in appropriate Sections in Division 01.
   1. Manufacturer's Inspection and Training Services: Furnish services of manufacturer authorized representative to verify correct installation and perform training of Owner's staff.

3.06 STARTUP, COMMISSIONING, AND TRAINING

A. Manufacturer's Startup Services: Provide startup supervision and training of Owner's personnel in the proper operation and maintenance of equipment.

B. Commissioning Agent: Use Alpha Labs Air Ion Counter's Model fiAIC2" or fiAIC3-Profl and confirm, on installed units, that ion output meets value listed on product data sheet when both polarities are measured and added together.
   1. Measurement: One inch (0.98 inch) from electrode without airflow.
   2. For Each Installation: Randomly select and test minimum 10 percent of installed units to confirm compliance and Submit test report.

C. Training: Train Owner's™ personnel on use and replacement of NPBI air ionization system or NPBI components.

END OF SECTION €23 4316

SECTION 23 8126.13
SMALL-CAPACITY SPLIT-SYSTEM AIR CONDITIONERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Air cooled condensing units.

B. Indoor air handling (fan and coil) units for ducted systems.

C. Controls.

1.02 RELATED REQUIREMENTS

A. Section 22 1005 - Plumbing Piping: Includes indoor coil condensate drain.

B. Section 23 3100 - HVAC Ducts and Casings.

C. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections and installation and wiring of thermostats and other controls components.

1.03 REFERENCE STANDARDS

A. AHRI 210/240 - Standard for Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2008, Including All Addenda.

B. AHRI 520 - Performance Rating of Positive Displacement Condensing Units; 2004.

C. ASHRAE Std 15 - Safety Standard for Refrigeration Systems; 2019, with All Amendments and Errata.

D. ASHRAE Std 23 - Methods for Performance Testing Positive Displacement Refrigerant Compressors and Compressor Units; 2022.

E. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2021.

G. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2018.

H. UL 207 - Standard for Refrigerant-Containing Components and Accessories, Nonelectrical; Current Edition, Including All Revisions.

I. UL 1995 - Heating and Cooling Equipment; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.

C. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.

D. Warranty: Submit manufacturers warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.

1.05 WARRANTY

A. Provide three year manufacturers warranty for solid state ignition modules.

B. Provide five year manufacturers warranty for heat exchangers and condensing units.

C. Provide five year manufacturers warranty for electronic air cleaners.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Carrier Corporation: www.carrier.com/#sle.

B. Rheem Manufacturing Company Inc: www.rheem.com/#sle.

C. Trane Technologies, PLC: www.trane.com/#sle.

D. Lennox: www.lennox.com/#sle.

E. Substitutions: See Section 01 6000 - Product Requirements.

F. Basis of Design: Lennox

2.02 SYSTEM DESIGN

A. Split-System Heating and Cooling Units: Self-contained, packaged, matched factory-engineered and assembled, pre-wired indoor and outdoor units; UL listed.
   1. Heating: Electric resistance heating.
   2. Cooling: Outdoor electric condensing unit with evaporator coil in central ducted indoor unit.
   3. Provide refrigerant lines internal to units and between indoor and outdoor units, factory cleaned, dried, pressurized and sealed, with insulated suction line.

B. Performance Requirements: See Drawings for additional requirements.
   1. Efficiency:
      a. Seasonal Energy Efficiency Ratio (Nominal): 18, minimum.

2.03 INDOOR AIR HANDLING UNITS FOR DUCTED SYSTEMS

A. Manufacturers:
   1. Carrier Corporation: www.carrier.com/#sle.
   2. Rheem Manufacturing Company Inc: www.rheem.com/#sle.
   3. Trane Technologies, PLC: www.trane.com/#sle.
   4. Lennox: www.lennox.com/#sle..

B. Basis of Design: Lennox - Units shall be 2 stages

C. Indoor Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heating and cooling element(s), controls, and accessories; wired for single power connection with control transformer.
   1. Air Flow Configuration: Upflow.
   2. Cabinet: Steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner.

D. Supply Fan: Centrifugal type rubber mounted with direct or belt drive with adjustable variable pitch motor pulley.

E. Air Filters: 1 inch thick glass fiber, disposable type arranged for easy replacement.

F. Evaporator Coils: Copper tube aluminum fin assembly, galvanized or polymer drain pan sloped in all directions to drain, drain connection, refrigerant piping connections, restricted distributor or thermostatic expansion valve.
   1. Construction and Ratings: In accordance with AHRI 210/240 and UL 207.
   2. Manufacturers: System manufacturer.

2.04 OUTDOOR UNITS

A. Outdoor Units: Self-contained, packaged, pre-wired unit consisting of cabinet, with compressor and condenser.
   1. Comply with AHRI 210/240.
   2. Refrigerant: Use only refrigerants that have ozone depletion potential (ODP) of zero and global warming potential (GWP) of less than 50.
   3. Refrigerant: Provide A2L refrigerant to meet ASHRAE 15.

4. Construction and Ratings: In accordance with AHRI 210/240 with testing in accordance with ASHRAE Std 23 and UL 207.

B. Air Cooled Condenser: Aluminum fin and copper tube coil, AHRI 520 with direct drive axial propeller fan resiliently mounted, galvanized fan guard.

C. Accessories: Filter drier, high-pressure switch (manual reset), low pressure switch (automatic reset), service valves and gauge ports, thermometer well (in liquid line).
   1. Provide thermostatic expansion valves.

D. Operating Controls:
   1. Control by room thermostat to maintain room temperature setting.
   2. Low Ambient Kit: Provide refrigerant pressure switch to cycle condenser fan on when condenser refrigerant pressure is above 285 psig and off when pressure drops below 140 psig for operation to 0 degrees F.

2.05 ELECTRIC FURNACE COMPONENTS

A. Electric Heater: Helix wound bare nichrome wire heating elements arranged in incremental stages of 5 kW each, with porcelain insulators.

B. Operating Controls:
   1. Heater stages energized in sequence with pre-determined delay between heating stages.
   2. High limit temperature control to de-energize heating elements, with automatic reset.
   3. Supply fan started before electric elements are energized and continues operating after thermostat is satisfied until bonnet temperature reaches minimum setting. Include manual switch for continuous fan operation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrates are ready for installation of units and openings are as indicated on shop drawings.

B. Verify that proper power supply is available and in correct location.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions and requirements of local authorities having jurisdiction.

B. Install in accordance with NFPA 90A and NFPA 90B.

C. Install refrigeration systems in accordance with ASHRAE Std 15.

END OF SECTION 23 8126.13

PART 1 GENERAL

1.1 SCOPE

A. The work to be performed under these specifications shall include the furnishing of all labor, materials, equipment and services required for a complete electrical system as specified herein and as shown by the Drawings. A state of Louisiana licensed Electrical Contractor shall perform the work specified herein. The work includes but is not limited to:

1. Furnishing and installing conduits with conductors from existing switchboard to the 45 kVA stepdown transformer as shown on the drawings.
2. Furnishing and installing new 45 kVA step down transformer as shown on the drawings.
3. Furnishing and installing new distribution panel ‘GR’ to feed the new Green Room as shown on the drawings.
4. Furnishing and installing lighting fixtures, receptacles, toggle switches, and special outlet boxes for electrical systems shown on Drawings.
5. Furnishing and installing emergency lighting and exit lighting fixtures and circuits.
6. Furnishing and installing lighting controls, low-voltage switches, occupancy sensors, and control wiring.
7. Furnishing and installing electrical conduit and wiring required for connection of mechanical equipment furnished under other sections of these specifications.
8. Furnishing and installing light fixtures.
9. Furnishing and installing rough-ins (outlet boxes and empty conduit) for future communications devices and wiring as shown on the drawings.
10. Installation of temporary construction power required by the General Contractor and Sub-Contractors during the construction period.

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. The word "shall" where used, is to be understood, as mandatory and the word "should" as advisory. "May" is used in the permissive sense.

1.3 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.

1.4 MINIMUM STANDARDS

A. Applicable rules of the National Electrical Code apply as a minimum standard for this contract, but do not replace or reduce any specific requirement herein.

1.5 DRAWINGS

A. Plans and detail sketches are submitted to limit, explain, and define structural 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.

1.6 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, 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.

1.7 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.

1.8 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.

1.9 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.

1.10 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.

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.

2.2 SHOP DRAWINGS

A. The Contractor shall submit to the Architect complete descriptive and dimensional data on the following items for review and approval:
   1. Panelboards
   2. Disconnect Switches
   3. Lighting Fixtures
   4. Lighting Control Panel
   5. Occupancy Sensors and Dimmer Switches
   6. Conduit, Conduit Fittings, and Conduit Ground Bushings
   7. Conductors
   8. Ground Rods/Wells

9. Surge Protection Devices
10. Data Cables and Jacks
11. Dry-Type Transformer

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.

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 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.
1. National Electrical Code, Latest Edition as accepted by the State Fire Marshal
2. National Electrical Manufacturers Association Standards
3. National Fire Protection Association Recommended Practices
4. Local, City and State Codes and Ordinances
5. National Board of Fire Underwriter's Recommended Practices
6. Life Safety Code, 2015 Edition
7. International Building Codes

B. Equipment that has been inspected and approved by the Underwriter's Laboratory shall bear its label or appear on its list of approved apparatus.

3.5 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.

3.6 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.

3.7 HEATING AND AIR CONDITIONING SYSTEM

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.

3.8 EQUIPMENT NAMEPLATE

A. Each item of electrical equipment installed by the Contractor shall be provided with an engraved nameplate noting the equipment's function or designation. Nameplates shall be engraved laminated plastic with black letters on a white background. Letters shall be 1/4" high, all caps.

3.9 PANELBOARD SCHEDULES

A. The Contractor shall provide and affix typed panelboard schedules for each panelboard. Schedule will accurately list equipment served by each branch circuit, and not simply indicate “LIGHTING” or “RECEPTACLES”, etc. Schedules shall indicate rooms served and device or devices connected to the circuit.

B. Where new loads are connected to existing panels, and where loads are rearranged in existing panels as part of this project, the Contractor shall update the respective panel directory so as to provide a complete, accurate, and typewritten panel schedule. The new panel schedule shall incorporate all existing loads, including loads “existing to remain”. Provide all required testing and investigations necessary to accomplish this work.

3.10 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.

3.11 RECORD DRAWINGS

A. The Contractor shall furnish one (1) complete set of drawings on which any changes in the work shall be shown. These drawings must be turned over to the Architect prior to final acceptance of the work.

3.12 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.

3.13 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.

3.14 INSTRUCTION MANUALS

A. The Contractor shall provide three (3) operating and maintenance instruction manuals on all systems and equipment installed in the electrical work.

3.15 CONTRACTOR SPECIAL NOTE

A. The Contractor is again cautioned to refer to all parts of these Specifications and all Drawings, not just electrical sections, and the individual cross references made to other standard specifications or details describing any electrical work, which may be required under these other sections. The Contractor is cautioned to note carefully any other sections which may reference electrical work in order for this Contractor to fully understand the wiring requirements and electrical work that is required. Any conflicts found between the electrical sections of these Specifications or Drawings shall be immediately directed to the General Contractor for clarification.

B. These Specifications and the electrical Drawings size equipment, wire, conduit, etc. based on the horsepower of motors and/or wattages of equipment as shown on the plans or specified herein. The Contractor shall install electrical raceways, conductors, fuses, safety switches, breakers, contactors, starters or any other electrical equipment with the capacities to suit the horsepower and/or wattages of the equipment actually furnished and installed. The Contractor shall not furnish or install any electrical raceways, conductors, safety switches, contactors or motor starters of sizes smaller than those shown on the Drawings or specified herein. The Contractor shall coordinate with the various sections of the Specifications and/or Drawings and with the various Sub-Contractors to provide the properly sized equipment without additional cost to the Owner.

C. The Contractor shall be required to install electrical services underground. Existing underground utilities should be disconnected. Refer to the electrical and mechanical drawings for demolition plans. However, some existing underground utilities may remain in service at the site. Contractor is cautioned to exercise extreme care when digging to not damage any existing utilities or equipment. Contractor shall be required to repair any utilities or equipment he may damage during construction.

END OF SECTION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. All material furnished shall be new and shall conform to all rules and codes as recommended or adopted by the National Association governing the manufacture, rating and testing of the material. All electrical equipment shall be UL listed for the intended use.

PART 2 PRODUCTS

2.1 RACEWAYS AND FITTINGS

A. Raceways permitted on this project shall be hot dipped galvanized rigid steel conduit; electrical metallic tubing (EMT); flexible metallic tubing; liquid-tight flexible metal conduit; and rigid polyvinyl chloride (PVC) conduit. All conduits shall be new and shall bear the inspection label of the Underwriter's Laboratories, Inc. MC cable shall not be permitted to be used.

B. Metallic conduit shall be metalized, or hot-dipped galvanized. Non-metallic conduit shall be schedule 40 PVC.

C. Fittings for conduit shall be an approved type specially designed and manufactured for their purpose. EMT fittings shall be watertight, compression type. Rigid metal conduit fittings, bushings, and other components shall be galvanized. All fittings for rigid steel or aluminum conduit shall be threaded and coupled unless specifically approved otherwise by the Engineer.

D. Where conduit connects to an outlet box, it shall have an insulated throat type connector.

2.2 EXPOSED CONDUIT

A. Exposed conduit shall be firmly supported on galvanized hangers; on brackets, hangers, or pipe straps; or by beam clamps. Conduit installed exposed shall be neatly aligned and run at right angles to the building walls or walls of the rooms in which installed. All exposed conduit shall be located to avoid all conflicts with architectural or mechanical components.

2.3 FLEXIBLE CONDUIT

A. Liquid-tight flexible metal conduit shall have a spiral wound, flexible, galvanized steel core and a tough extruded synthetic moisture-tight outer covering. All flexible conduits shall be UL listed.

2.4 GALVANIZED CONDUIT

A. Galvanized conduit furnished in accordance with these specifications shall be of mild steel piping, galvanized inside and outside, and shall conform in all respects to the American

Standard Association Rigid Steel Conduit Specification C80.1-1959 and Underwriter's Laboratories Specifications.

B. The galvanized coat of zinc shall be of uniform thickness applied by the hot-dipped process to not only the inside surfaces of the conduit, but also to the threads of the conduit. It shall be further dipped in a chromic acid bath to chemically form a corrosive resistant protective coating of zinc chromate over hot-dipped galvanized surface. Each piece of conduit shall be straight, free from blisters and other debris, cut square and taper reamed, and furnished with coupling in 10-foot length threaded each end. The interior threaded surface of each coupling shall be galvanized to insure 100% galvanic protection on all surfaces. The hot galvanized zinc chromate on the inside and outside surfaces shall be sufficiently elastic to prevent cracking or flaking when sample of finished conduit is bent 90^{o} at a minimum temperature of 60^{o}F, the inner edge of the bend having a radius of six (6) times the inside diameter of the conduit.

2.5 RACEWAYS

A. Lay-in duct, JIC Wireway and troughs shall be NEMA 1 for indoor application and NEMA 3R for outdoor or applications exposed to weather or water. Raceways shall be sized as noted on Drawings and shall have hinged or screw covers with captive screws. Finish shall be gray enamel. All components shall be UL listed for steel enclosed wireway or auxiliary gutter.

2.6 OUTLET AND SWITCH BOXES

A. Outlet boxes in concealed conduit systems shall be flush mounted. Boxes shall be galvanized steel of sufficient size to accommodate devices shown and shall have raised covers where required to meet requirements of NEC Article 314.

B. All boxes shall be stamped, one-piece, galvanized steel, of proper size and shape for conduits entering them, and shall be UL listed and NEC approved for the intended use. Boxes shall be installed so that device and/or coverplates shall be tight and plumb with wall finish, have all unused openings closed with knock-out plugs, and be weatherproof for exterior locations.

C. Boxes for lighting fixtures shall be 4 inches octagon, not less than 1-1/2 inches deep, with fixtures stud fastened through from back box. Where boxes are installed in a concrete slab, boxes designed for this application shall be used.

D. Outlet boxes for switches in concealed work shall be standard switch boxes of required number of gangs. Outlet boxes for receptacles, telephone, and communication use in concealed work shall be 4-inch square, not less than 1-1/2 inches deep. Outlet boxes for switches and receptacles installed in exposed conduit system shall be cast type FS or FD, number of gangs as required. Outlet boxes for telephone and communication use in exposed systems to be cast, 4 inches square, not less than 1-1/2 inches deep.

E. Boxes shall not to be installed back-to-back in walls. Offset with connecting conduit as

specified. Do not use long, extended boxes that would effectively couple light and sound between adjoining spaces.

2.7 WIRE (600 VOLT AND BELOW)

A. All conductors used in the work shall be of soft drawn annealed copper having a conductivity of not less than 98% of that of pure copper. Conductors shall be standard code gauge in size, insulated and shall have insulation rated for use at 600 volts.

B. Unless noted otherwise or specified, insulation shall be type THW, THWN, or THHN for sizes up to and including No. 2 AWG. Insulation for wire sizes larger than No. 2 AWG shall be type THW, XHHW, or THHN. Lighting fixture wire shall be heat resistant type TF (150^{o}C) with 300-volt insulation minimum. Wires shall be of the single conductor type. Sizes No.14 AWG and larger shall be stranded. No wire shall be single strand solid copper.

C. Throughout the system, all conductors shall be identified as to the phase and voltage of the system by color-coding in accordance with NEC 210.5. Color-coding shall be continuous the full length of the wire with surface printing at regular intervals on all conductors and for neutral conductors.

D. Color coding shall be as follows:

3phase, 480V System	3phase, 208V System
Phase 1-Brown	Phase 1-Black
Phase 2-Orange	Phase 2-Red
Phase 3-Yellow	Phase 3-Blue
Neutral-Gray	Neutral-White
Ground-Green	Ground-Green

2.8 WEATHERPROOF RECEPTACLES

A. Weatherproof receptacles shall be GFCI duplex receptacles as specified under WIRING DEVICES, mounted in a cast iron type FD conduit box and fitted with gasketed metal cover with spring. Weatherproof receptacles shall be flush mounted in exterior walls.

2.9 WIRING DEVICES

A. Wiring devices shall be as listed. The color of device shall match color of outlet cover plate. It shall be the responsibility of the Contractor to provide plugs, receptacles and fittings required for any equipment furnished or installed or connected under the contract. Color as selected by the Architect.

	Leviton	P & S	Hubbell
Toggle Switches: 20A 120/277V			
Single pole	1221-I	20AC1-I	1221-I
Three-way	1223-I	20AC3-I	1223-I
Duplex Receptacle: 20A, 125V,			

NEMA 5-20R	5362-I	5362-I	5363-I
Ground Fault Circuit Interrupter:			
20A, 125V, Feed Through, NEMA 5-20R	6899-I	2091-S	GF-5362-I

B. Quad receptacles shall be 20-amp, 125 volt rated, NEMA 5-20R, with two (2) duplex receptacles or single four-plex device.

2.10 OUTLET COVER PLATES

A. Unless otherwise specified, all outlets shall be fitted with cover plates. Cover plates shall be standard size, uniform in design and finish for switches, receptacles and other outlets requiring cover plates. Plates shall be one piece of the required number of gangs. All cover plates shall be lexan unbreakable type. Architect shall select coverplate color.

2.11 SPECIAL PURPOSE RECEPTACLE

A. Provide receptacles for special purpose devices as indicated on the plans. Refer to equipment specification for proper receptacle to be supplied. Provide stainless steel cover plate.

2.12 FIRESTOPPING PRODUCTS

A. The Contractor shall provide and install at all fire-rated wall through-penetrations, a non-hardening, conformable firestop system. The system shall consist of a water insoluble putty and suitable damming materials (where required). The non-hardening putty shall be a two-staged intumescent and capable of expanding up to 8 times its original volume. This putty shall contain no asbestos, no fiberglass, no solvents nor corrosive mineral salts of any kind. It shall remain soft during its installed life and shall be capable of being removed and reinstalled to facilitate the addition of cables or pipes. The putty shall exhibit aggressive adhesion to all common building materials and penetrants and shall allow reasonable movement of penetrants without being displaced. The firestop system shall be tested to the time/temperature requirements of ASTM E119 and shall be tested to UL 1479 (ASTM E814) and classified for up to 3 hours.

2.13 GROUND ROD

A. Ground rods shall be pure copper with a minimum diameter of ¾" and 10' long. Erico LPC711 or equivalent.

2.14 TRAFFIC RATED IN GRADE PULL BOXES

A. Pull boxes shall be heavy duty, traffic bearing type. Boxes shall be polymer concrete and fiber reinforced polyester construction. Boxes shall be furnished complete with bottom and cover with logo. All pull boxes shall be sized 30" wide x 48" long x 36" deep. Pull boxes shall include two-piece cover with stainless steel bolts, POWER legend, and pull slots for lifting. Boxes shall be Tier 15 traffic rated. Boxes shall be factory assembled.

B. Boxes shall be Hubbell/CDR Systems Corporation Straight Wall Style (Stackable) Assembly, or Quazite Composolite “PC” Style.

2.15 FLOOR BOXES

A. Floor boxes shall meet UL 514A and 514B and be metallic (unless otherwise noted on the drawings). Floor boxes shall be selected with respect to the particular substrate (concrete or wood) and have all colors, trims, and coverplates approved by the Architect. Floor boxes shall be metallic and have separations for the installation of low voltage cabling in the same box as power receptacles where indicated by the drawings.

B. Floor boxes for use with furniture systems shall be sized as per the furniture manufacturer’s instructions and per the NEC for the number of splices and connections in the box. Provide all required coordination with the furniture manufacturer for correct rough-in locations, wiring convention, and final connections to the modular furniture.

C. Floor box coverplates shall be flush mounted, metallic, and the style (carpet, tile, etc.) shall be approved by the architect prior to ordering.

D. Floor boxes shall be able to accommodate a minimum of two (2) 2” incoming conduits, one for power conductors, and one for data/communications/low voltage cabling.

E. The box shall meet or exceed the fire rating of the floor in which it is installed.

2.16 ALUMINUM CONDUCTOR OPTION

A. Aluminum feeder conductors will be allowed as a replacement of copper conductors ONLY where shown on the drawings. Aluminum conductors shall meet the following product description.

B. APPLICABLE STANDARDS: The following standards form a part of this specification to the extent specified herein: Underwriters Laboratories Standard 44 for Rubber Insulated Wires and Cables. ICEA Pub. No. S-95-658, NEMA Pub. No. WC70 for Nonshielded Power Cables Rated 2000 Volts or Less.

C. CONDUCTORS: Conductors shall be Class B stranded annealed uncoated aluminum per UL Standard 44.

D. SEPARATOR: A suitable separator over the conductor may be used at the option of the manufacturer.

E. INSULATION: Each conductor shall be insulated with Rome FR-XLPE, a flame retardant crosslinked polyethylene complying with the physical and electrical requirements of UL Standard 44 for Type XHHW-2. In addition, the Rome FR-XLPE insulation shall comply with the For CT Use (sizes 1/0 AWG and larger) and VW-1 flame test ratings and the Gasoline and OilResistant II ratings of UL Standard 44. The insulation shall maintain a dielectric constant of 3.5 or less. The average thickness of insulation shall be as specified in UL Standard 44 for Type XHHW-2. The minimum thickness at any point shall be not less

than 90% of the specified average thickness. The insulation shall be applied tightly to the conductor and shall be free-stripping.

F. IDENTIFICATION: The wire shall be identified by surface marking indicating manufacturer's identification, conductor size and metal, voltage rating, UL symbol, VW-1, type designation, Gasoline and Oil Resistant II and Sunlight Resistant For CT Use (1/0 AWG and larger).

G. TESTS: Wire shall be tested in accordance with the requirements of UL Standard 44 for Type XHHW-2.

H. LABELS: The wire shall bear the Underwriters Laboratories label for Type XHHW-2.

PART 3 EXECUTION

3.1 WIRING - GENERAL

A. Unless otherwise specified, all wiring shall be installed in conduit. No wire shall be smaller than No. 12 unless noted otherwise. Wiring for low voltage control may be #14 AWG. Wire for each branch circuit shall be of single size and type from the branch circuit protective device the last outlet of the circuit. BX wiring shall not be allowed.

B. Feeders, motor circuit conductors and main service entrance conductors shall run their entire length without joints or splices. Wiring for branch circuits shall run the entire length without splices, with splices and joints made only at outlets or in accessible junction boxes only when absolutely necessary and approved by the Engineer. Joints and splices in branch circuit wiring shall be made with compression type solderless connectors.

C. Connectors of the non-metallic screw on type are not acceptable. Terminations or splices for conductors No. 6 AWG and larger shall utilize bolted connecting lugs. All splices and terminations shall be insulated in an approved manner by an integral or separate cover or by taping to provide insulating value equal to that of the conductors being joined.

D. Type THW or THWN conductors may be connected directly to recessed fixtures only when the fixtures are equipped with outlet boxes listed by Underwriter's Laboratories, Inc. for use with wire having insulation rated for maximum operating temperatures of 75^{o}C (167^{o}F); otherwise, for fixtures not rated for 75^{o}C directly connection, use 125^{o}C insulated conductors from the fixture to an outlet box placed at least one (1) foot, but not more than four (4) feet from the fixture.

E. Branch circuit home run numbers shown on the drawings shall be used as a guide for connection of circuit wiring to similarly number protective devices in branch circuit panelboards. Requests for changes in the plans shall be directed to the Architect. No changes shall be made without approval from the Architect.

F. Each circuit shall be furnished with its own neutral conductor. There shall be no sharing of neutral conductors.

G. In instances where a junction box, wireway, etc. contains three (3) or more branch circuits, the feeders shall be labeled within the junction box, wireway, etc. with circuit location, including panel name and breaker number. Labeling shall be neatly typed and affixed to each feeder. Labeling shall meet all applicable Code requirements.

H. No more than three (3) 20A/1P circuits may be installed in a single conduit. Circuits may not share grounds or neutrals. Conductors sharing raceways shall be derated per table 310.15(B)(3)(a) of the NEC.

3.2 ELECTRICAL SERVICE GROUNDING

A. Main electrical service equipment, conduit work, motors, panelboards and all other electrical equipment shall be effectively and permanently grounded. Grounding connections and conductor sizes shall be in accordance with requirements of the National Electrical Code, Article 250 and local or State ordinances.

B. Provide as part of the service grounding system an ufer ground in the building slab. The ufer ground shall be 20' long bare #4 copper wire and bonded to the main service ground lug with a grounding electrode cable of the size indicated on the drawings.

C. The building foundation steel and structural steel (if applicable) shall be connected to the service entrance ground lug with a grounding electrode cable of the size indicated on the drawings.

D. All ground lugs shall be properly torqued, as per the gear manufacturer's instructions and provide pictures of all ground connections to the architect and engineer for inspection before they are covered.

E. All grounding connections shall be mechanically made. Cadwell style connections are not permitted.

3.3 EQUIPMENT GROUNDING

A. All conduit entering panelboards shall be grounded to the panelboard by means of a grounding type locknut installed on the inside of the panelboard. Where the continuity of the metallic conduit system is interrupted by a section of non-metallic conduit, as separate grounding conductor, sized in accordance with NEC table 250.122 shall be installed in the conduit with the insulated conductors. A separate grounding conductor, as described above or as called for on the plans, shall be run in the conduit with the circuit conductors for all circuits serving multi-outlet assemblies.

B. Conduit runs shall be increased in size where necessary to accommodate the grounding conductor in addition to circuit conductors. The grounding screw on all grounding type receptacles shall be securely grounded to the outlet box using a No. 12 green insulated

conductor attached to the outlet box with lug screw.

C. The grounding screw on all grounding type receptacles shall be security grounded to the outlet box using a No. 12 green insulated conductor attached to the outlet box with lug screw. Ground screws shall be green.

D. All switch legs shall include a green ground conductor connected to the circuit ground conductor and terminated in the switch outlet box.

3.4 CONDUIT - MATERIALS AND METHODS

A. Conduit shall be installed as per NEC and NEMA regulations and the manufacturer's recommendations. Conduit shall be as follows:

B. Rigid Steel Conduit shall be used for all conduits exposed to the weather, and underground conduit except where non-metallic conduit is specified or approved. Underground and under slab runs are to be watertight. All horizontal runs of underground conduit shall utilize rigid steel elbows on vertical risers. Conduits used for receptacles and run under the building slab shall be hot dipped galvanized rigid steel and shall be 3/4" minimum size.

C. All conduits routed underground shall not be placed in building slab. Conduits larger than 1" routed under building slab shall be routed below the vapor barrier. Minimum conduit size allowed to be routed underground shall be 3/4". Conduits routed under building slab may be PVC. All conduits rising vertically out of slab or out of ground shall be type RMC to 48” above finished floor.

D. Electrical Metallic Tubing or metal clad cabling (if permitted) shall be used for all other feeders, branch circuit and communications and control wiring where rigid steel or non-metallic conduit is not specified.

E. Non-metallic conduit, minimum schedule 40 PVC, shall be permitted to be installed underground. Non-metallic conduit shall not be used in any environmental air plenum. If PVC conduit is run, a full-sized grounding conductor shall be pulled with the circuit conductors. PVC conduit shall not be run exposed. Where PVC conduit is run underground, it shall be encased in concrete or run minimum 24" below grade, or at the depth below grade shown on the drawings.

F. Flexible metallic tubing and EMT shall only be permitted in spaces above finished ceilings and within enclosed walls within the interior of buildings. Flexible metallic tubing shall only be permitted for the final four (4) feet of conduit runs to fixtures located above finished ceilings. No flexible metallic tubing or EMT will be permitted exposed. Also, EMT may not be installed in or below concrete slabs.

G. Flexible metal conduit or liquid-tight flexible metal conduit shall be used for the final connection of runs to motors. Flexible conduit shall be at least twelve (12) inches, but not

more than 48 inches long. Where used, an external grounding conductor shall be run with conduit unless conductor is made as a part of the conduit.

H. Conduits installed underground and used for communications system wiring shall be reviewed with the communications contractor prior to installation. As an example, conduits below the vapor barrier may require moisture proof wiring to comply with the structured connectivity solution or conduits may need to be installed above the vapor barrier to maintain connectivity solution compliance. All conduit shall conform to the requirements of the data manufacturer's warranty and be accepted by the communications contractor.

I. Set screw conduit fittings shall not be permitted.

3.5 CONDUIT - GENERAL

A. Fittings for rigid steel conduits shall be hot-dipped galvanized steel and shall be of a type especially designed and manufactured for their purpose. Fittings for EMT shall be die cast zinc type. Rigid conduit joints for single conduit runs shall be made with threaded fittings made tight with at least five threads fully engaged. Fittings for rigid non-metallic conduit shall be solvent welded.

B. All conduits shall be installed concealed or as indicated or scheduled on the drawings and shall be of sufficient size to accommodate the required number of insulated conductors including equipment grounding conductor where such grounding conductor is required or specified.

C. Conduit runs shall be straight; elbows and bends shall be uniform, symmetrical and free from dents or flattening. Exposed conduit shall be firmly supported on galvanized hangers; on brackets, hangers, or pipe straps; or by beam clamps. Conduit installed exposed shall be neatly aligned and run at right angles to the building walls or walls of the rooms in which they are installed. All exposed conduit shall be located to avoid all conflicts with architectural or mechanical components.

D. Pull boxes shall be installed as required to permit proper installation of conductors and expansion fittings installed where conduit runs cross building expansion joints.

E. Conduit shall be run no closer than six (6) inches to covering of hot water or steam piping except where crossings are unavoidable. Conduit shall be kept at least one (1) inch from crossing steam and hot water piping.

F. Conduit shall be held securely in place by hangers and fasteners of appropriate design and dimensions for the particular application. Support shall be such that no strain will be transmitted to outlet box and pull box supports. Wire shall not be used, with or without spring steel fasteners, clips or clamps, for the support of any conduit. Conduit shall not be supported by or attached to duct work unless specifically allowed otherwise.

G. Hangers and other fasteners shall be supported on solid masonry with inserts or expansion sleeves and bolts, on wood with wood screws, hollow masonry with toggle

bolts, on steel with machine screws or welded threaded studs. Fastenings shall be proof tested by the Contractor for secure mounting.

H. All conduits shall be cut square and reamed at the ends. The conduit system shall be complete and cleaned before any conductors are installed. Open ends of all conduits shall be capped until conductors are installed. A non-metallic fish wire shall be installed in all empty conduits. Empty conduit shall remain capped.

I. Contractor shall refer to National Electrical Code Appendix C, Conduit and Tubing Fill Tables for Conductors and Fixture Wire of the Same Size. Contractor shall refer to the appropriate table for the conduit and wire condition and shall install wiring in accordance with code requirements.

J. Conduits entering buildings from exterior mounted equipment or devices shall be properly sealed per NEC Section 300.7 requirements to avoid condensation build up.

K. Threaded hubs shall be utilized for conduits entering exterior mounted enclosures and shall be rated for outdoor installation.

3.6 FLEXIBLE CONDUIT

A. Flexible metal conduit may be used for short final connections to equipment where permitted by governing codes. Flexible metal conduit shall be sized and supported in accordance with Article 350 of the NEC or more stringent local codes. A separate equipment-grounding conductor sized in accordance with NEC Table 250.122 shall be installed in flexible conduit unless exceptions are allowed by governing codes and if the fittings used are UL listed for the purpose.

B. Liquid-tight flexible metal conduit shall be used where flexible conduit is permitted and desired and conditions of installation, operation, or maintenance require protection from liquids, vapors, or solids and in other hazardous locations where specifically approved. Flexible conduit for all exterior motor connections shall be liquid tight. Liquid-tight flexible conduit shall be used with terminal fittings approved for the purpose.

3.7 FIRE-RATED WALL AND FLOOR THROUGH-PENETRATIONS

A. All fire-rated walls or floors penetrated by this Contractor shall be properly sealed with fire stopping materials. All floor through-penetrations shall be fire stopped with a light-weight mortar material. Wall through-penetrations shall be fire stopped with a non-hardening putty material. Contractor shall see that all penetrations are fire stopped and seals are inspected.

3.8 SUPPORTS AND FITTINGS

A. The Contractor shall furnish and install all supports for equipment under this contract. Supports shall be spaced at intervals of eight (8) feet maximum for rigid conduit and five (5) feet maximum for EMT and as necessary to obtain rigid support. Perforated strap

supports will not be permitted.

B. All conduits shall be firmly secured with pipe clamps, conduit straps, or suspension hangers as appropriate. Fasten to steel with screws in tapped holes, to wood with wood screws, and to masonry with expansion anchors. Expansion anchors shall have a minimum pull out load of 1,200 pounds and an ultimate shear load of 1,950 pounds.

C. All conduit, fixtures, and accessories shall be rigidly supported to form a firm, well-braced installation.

D. Joints shall be made tight with standard galvanized or sheradized couplings; corners turned with fittings, elbows, or long radius bends.

E. Low voltage wiring installed above accessible ceilings shall be supported on J-hooks. J-hooks installed for communications system wiring shall not be used for other low voltage system wiring (fire alarm, security, EMS controls, etc.).

3.9 WEATHERPROOF EQUIPMENT

A. All disconnect switches, starters, and other electrical equipment located on the exterior of the building or exposed to the outside shall be enclosed in a rain-tight enclosure.

B. All lighting fixtures or other devices located on an exterior wall of the building shall be mounted on a flush-mounted, cast outlet box.

3.10 MOUNTING HEIGHTS

A. Unless otherwise noted on the drawings or required by the Architect, the following mounting heights shall apply:

Toggle Switches	4'-0"
Receptacles	1'-6"
Panelboards	6'-0" to top
Telephone Outlets	1'-6" (48" for wall phone)
Safety Switches	5'-0" to top
Motor Control Equipment	5'-0" to top
Wiring Devices above counters	0'-6" above countertop
Fire Alarm Manual Stations	4'-0"
Fire Alarm Annunciation Devices	80" or 6" below ceiling (whichever is lower)

B. Upon permission of the Architect, mounting heights may be adjusted to simplify cutting of masonry units or to facilitate furniture and cabinet arrangements. Dimensions above refer to the centerline of the device unless noted otherwise.

3.11 HOUSE KEEPING PADS

A. 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 3" beyond the edge of the respective electrical equipment.

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

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 26 05 72 "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.
   e. 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.
   f. 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

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 26 05 72 "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 26 05 73 "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 26 05 53 "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 26 05 73 "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

PART 1 GENERAL

1.1 SYSTEM VOLTAGE

A. The building service from the existing switchboard is 277/480V, 3 phase, 4 wire. Voltage shall be stepped down via new 45 kVA 480V to 120/208V, 3 phase dry-type transformer.

1.2 TERMINATIONS

A. All wiring shall be sized based on 75°C rated conductors. All connectors shall be rated for 75°C in accordance with N.E.C. Article 110-14 requirements.

PART 2 PRODUCTS

2.1 SAFETY SWITCHES

A. Furnish and install safety switches as shown on the Drawings. All switches shall be fused NEMA Heavy Duty Type HD and Underwriter's Laboratories listed. All 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 suppressers. Lugs shall be UL listed for copper and aluminum conductor and front removable. All current carrying parts shall be plated to resist corrosion. Switches shall be quick-make, quick-break type. During operation of the switch, the movable contacts shall not be able to be restrained by the handle once the closing or the opening action of the contacts has been initiated. Switches shall have cover interlocks to prevent opening of the switch door while the switch is in the "ON" position or closing the switch with the door open. Switch shall have padlocking capabilities in the "OFF" position.

B. Safety switches shall be rated 600 volts for 480 volt service and rated 240 volts for 208 volt service. Switches shall be motor rated when used for motor loads. Switches shall be NEMA 1 enclosed for indoor applications and NEMA 3R for outdoor or wet area locations.

C. Switches used for service entrance shall be service entrance rated. Safety switches shall be furnished complete with fuses.

D. Safety switches shall be Square D Heavy Duty Class 3110 type, Eaton Heavy Duty type, or prior approved equal.

2.2 FUSES

A. All fuse holders shall be provided with dual-element, time-lag fuses as scheduled on the Drawings or as recommended by the equipment manufacturer. Fuses shall be rated 200,000 AIC. Fuses shall be Buss Fusetron, Economy Econ, or Gould Shawmut Tri-Onic for component protection and Buss Limitron, Economy Econolin, or Gould Shawmut Amp-Trap for circuit protection.

2.3 CIRCUIT BREAKER PANELBOARDS

A. Panelboards shall be sized as shown on the drawings and schedules, and shall be the bolted breaker panelboard type. Panelboards shall have copper bussing. Panelboards shall have door-in-door trim.

B. All branch breakers are to be quick-make, quick-break (over center toggle device) with trip indication and common trip on all multiple breakers. Trip indication shall be clearly shown by breaker handle taking a position between "ON" and "OFF" position. Breakers shall be ambient compensated to carry full NEC load in 120 degree F room temperature. Panelboards shall have 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. All breakers shall be bolt on type.

C. Minimum interrupting capacity of breakers shall be as shown on panel schedules. No breakers shall be rated less than 10,000 RMS symmetrical amperes.

D. Branch breakers shall be numbered 1, 3, 5, etc. from top to bottom beginning at the top of the left hand column so that #1 shall be on phase A, #3 on phase B, and #5 on phase C.

E. Panelboards for 120/208 volt or 120/240 volt service shall be Square D type NQ, Eaton Pow-R-Line series, or prior approved equal. Panelboards for 480/277 volt service shall be Square D type NEHB, Eaton Pow-R-Line series, or prior approved equal.

F. Replacement breakers to be installed in existing panels shall be fully compatible with the existing panel and shall be sized as shown on the Drawings. Breakers shall be bolt-on breaker type to match existing breakers or plug-on breaker type if plug-on breakers are utilized in the panel. If both bolt-on and plug-on breakers exist in the panel, bolt-on breakers shall be installed.

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. All transformers shall comply and must be tested in accordance with UL, NEMA and ANSI standards. Transformers shall be energy efficient and shall meet NEMA Standard TP-1 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. When transformer is delivering full KVA load continuously, temperature rise shall not exceed 150 degrees C above a 40 degree C ambient with 200 degrees C temperature class insulation system. The average sound level shall not exceed NEMA standards. Transformers shall have four external type taps, two 2-1/2% FCBN and two 2-1/2% FCAN. Windings shall be copper.

C. 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.

D. Transformers shall be floor mounted on isolation pads. 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.

E. Transformers shall be equal to Square D Class 7400 Dry Type, Eaton DT-3 Series, or prior approved equal.

PART 3 EXECUTION

3.1 COORDINATION

A. Contractor shall coordinate all service and distribution work with other crafts on the project.

3.2 TEST AND BALANCING

A. At such times as the Architect directs, the Contractor shall conduct in the Architect's presence operating tests to demonstrate the electrical systems are installed and will operate properly and in accordance with the requirements of the specifications. The Contractor shall furnish instruments and personnel required for such tests. Any work that is found to be defective, or material that are found to vary from the requirements of the drawings or specifications shall be replaced by the Contractor without additional cost of the Owner.

3.3 EMERGENCY CIRCUITS

A. All wiring for emergency power and lighting circuits shall be run in conduits independent of all other circuits or conductors. Emergency circuit installations shall be made in accordance with National Electrical Code Article 700.9.

3.4 EQUIPMENT FUSING

A. All equipment shall be furnished complete with fuses as described herein and/or as shown on the Drawings. Contractor shall furnish one set of spare fuses for each size fuse furnished on the project. Fuses shall be delivered to Owner prior to acceptance of project.

B. Fusing for protective equipment shall be of the type specifically designed for the intended application. Fuses for service entrance rated equipment shall be Class L. Fuses for branch circuit protection shall be Class RK5 unless specified otherwise. Provide protective fuses as specifically required by the equipment manufacturer.

3.5 INSTALLATION

A. The Electrical Contractor shall place a sign at the Main Switchboard indicating the type and location of the emergency generator in accordance with National Electrical Code Article 702.8(A) requirements.

B. Disconnecting means shall be provided for each motor and motor controller, and shall be located within site from the controller and motor locations in accordance with National Electrical Code Article 430.102 requirements.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

A. This section describes the materials and installation requirements for surge protective devices (SPD) for the protection of all AC electrical circuits.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section. Other sections that may relate to the work in this section include, but are not limited to, the following:
   1. Section 26 05 00 – Basic Electrical Materials and Methods

1.3 SUBMITTALS

A. Submit shop drawings and product information for approval and final documentation in the quantities listed according to the Conditions of the Contract. Customer name, customer location, and customer order number shall identify all transmittals.

B. Submittals shall include UL 1449 3rd Edition Listing documentation verifiable by visiting www.UL.com, clicking “Certifications” link, searching using UL Category Code: VZCA.
   1. Short Circuit Current Rating (SCCR)
   2. Voltage Protection Ratings (VPRs) for all modes
   3. Maximum Continuous Operating Voltage rating (MCOV)
   4. I-nominal rating (I-n)
   5. SPD shall be Type 1 UL listed and labeled

C. Upon request, an unencapsulated but complete SPD formally known as TVSS shall be presented for visual inspection.

D. Minimum of ten (10) year warranty

1.4 RELATED STANDARDS

A. The following codes and standards shall be referenced:
   1. IEEE C62.41.1, IEEE Guide on the Surge Environment in Low-Voltage (1000 V and Less) AC Power Circuits,
   2. IEEE C62.41.2, IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and Less) AC Power Circuits,
   3. IEEE C62.45, IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000 V and Less) AC Power Circuits.
   4. National Electrical Code: Article 285
   5. UL 1283 - Electromagnetic Interference Filters
   6. UL 1449, Third Edition, effective September 29, 2009 – Surge Protective Devices

1.5 LISTING REQUIREMENTS

A. SPD shall bear the UL Mark and shall be Listed to most recent editions of UL 1449 and UL 1283. “Manufactured in accordance with” is not equivalent to UL listing and does not meet the intent of this specification.

B. SPD and performance parameters shall be posted at www.UL.com under Category Code: VZCA. Products or parameters without posting at UL.com shall not be approved.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Engage a firm with at least ten (10) years’ experience in manufacturing transient voltage surge suppressors.

B. Manufacturer shall be ISO 9001 or 9002 certified.

C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (10) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

D. The SPD shall be compliant with the Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC.

1.7 DELIVERY, STORAGE AND HANDLING

A. Handle and store equipment in accordance with manufacturer’s Installation and Maintenance Manuals. One (1) copy of this document to be provided with the equipment at time of shipment.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Provide internally mounted transient voltage suppressors as described herein.

B. Manufacturer and/or manufacturer's model number listed in this Specification are used to establish general style, type, character, and quality of product desired. Similar items manufactured by manufacturers other than those listed will be considered, providing submittals are made according to Pre-Bid Approval requirements of Instructions to Bidders.

C. Where no manufacturer or model number are given, any product meeting performance or design criteria, or referenced trade association standard may be used and Pre-Bid Approval is not required.

D. Subject to compliance with the specified requirements, provide products by one of the following manufacturers:

Advanced Protection Technologies
Eaton

2.2 SURGE PROTECTIVE DEVICE FEATURES

A. SPD shall be UL 1449 labeled with 200kA Short Circuit Current Rating (SCCR). Fuse ratings shall not be considered in lieu of demonstrated withstand testing of SPD, per NEC 285.6.

B. SPD shall be UL 1449 labeled as Type 1 intended for use without need for external or supplemental overcurrent controls. Internal overcurrent and thermal overtemperature controls shall protect every suppression component of every mode, including N-G. SPDs relying upon external or supplementary installed safety disconnectors do not meet the intent of this specification.

C. SPD shall be UL 1449 labeled with 20kA I-nominal (I-n) (verifiable at UL.com) for compliance to UL 96A Lightning Protection Master Label and NFPA 780.

D. Suppression components shall be heavy duty 'large block' MOVs, each exceeding 30mm diameter.

E. Standard 7 Mode Protection paths: SPD shall provide surge current paths for all modes of protection: L-N, L-G, L-L, and N-G for Wye systems; L-L, L-G in Delta and impedance grounded Wye systems.

F. If a dedicated breaker for the SPD is not provided in the switchboard, the service entrance SPD shall include an integral UL Recognized disconnect switch. A dedicated breaker shall serve as a means of disconnect for distribution SPD's.

G. SPD shall meet or exceed the following criteria:
   1. Minimum surge current capability (single pulse rated) per phase shall be:
      a. Service Entrance applications:
         Eaton Model SPD300 Series with Maximum surge current capability of 300kA per phase.
         Siemens TPS3 01 series with Maximum surge current capability of 300kA per phase.
      b. Distribution applications:
         Eaton Model SPD200 Series with Maximum surge current capability of 200kA per phase.
         Siemens TPS3 01 series with Maximum surge current capability of 200kA per phase.
      c. Branch Panel applications:
         Eaton Model SPD100 Series with Maximum surge current capability of 100kA per phase.
         Siemens TPS3 01 series with Maximum surge current capability of 100kA per phase.
   2. UL 1449 Listed Voltage Protection Ratings (VPRs) shall not exceed the following:

VOLTAGE	L-N	L-G	N-G
208Y/120V	700V	700V	700V
240S/120V	700V	700V	700V
480Y/277V	1500V	1500V	1500V

H. UL 1449 Listed Maximum Continuous Operating Voltage (MCOV) (verifiable at UL.com):

System Voltage	Allowable System Voltage Fluctuation (%)	MCOV
208Y/120	25%	150V
240S/120	25%	150V
480Y/277V	20%	320V

I. SPD shall include a serviceable, replaceable module (excluding Distribution).

J. Service Entrance SPD shall have UL 1283 EMI/RFI filtering with minimum attenuation of -50dB at 100kHz.

K. SPD shall have a warranty for a period of ten (10) years, incorporating unlimited replacements of suppressor parts if they are destroyed by transients during the warranty period.

L. Service Entrance SPDs shall be equipped with the following diagnostics:
1. Visual LED diagnostics including a minimum of one green LED indicator per phase, and one red service LED.
2. Audible alarm with on/off silence function and diagnostic test function (excluding branch).
3. Form C dry contacts
4. Surge Counter
5. No other test equipment shall be required for SPD monitoring or testing before or after installation.

M. Distribution Panels and Branch Panels SPDs shall be equipped with the following diagnostics:
1. Visual LED diagnostics including a minimum of one green LED indicator per phase, and one red service LED.
2. No other test equipment shall be required for SPD monitoring or testing before or after installation.

N. Surge protection devices installed for individual equipment items shall meet or exceed the following criteria:
1. Minimum surge current capability (single pulse rated) per phase shall be:
   a. ASCO 420 series with dry contact and surge current capability shall be 50kA per phase.
2. UL 1449 Listed Voltage Protection Ratings (VPRs) shall not exceed the following:

VOLTAGE	L-N	L-G	N-G
208Y/120V	700V	1200V	600V
240S/120V	700V	1200V	600V

480Y/277V	1200V	1800V	1000V

3. UL 1449 Listed Maximum Continuous Operating Voltage (MCOV) (verifiable at UL.com):

System Voltage	Allowable System Voltage Fluctuation (%)	MCOV
208Y/120	25%	150V
240S/120	25%	150V
480Y/277V	20%	320V

4. Furnished with NEMA 4X Polycarbonate enclosure.

PART 3 EXECUTION

3.1 INSTALLATION

A. The installation shall meet the following criteria:
1. Install per manufacturer's recommendations and contract documents.
2. Install units plumb, level and rigid without distortion
3. One primary suppressor shall be installed internal to the service entrance in accordance with manufacturer instructions.
4. Service Entrance SPD shall be installed on the line or load side of the main service disconnect.
5. Service Entrance SPD ground shall be bonded to the service entrance ground.
6. At Service Entrance or Transfer Switch, a UL approved disconnect switch shall be provided as a means of servicing disconnect if a 60A breaker is not available.
7. One SPD shall be installed internal to each designated distribution panelboard.
8. At Distribution, MCC and Branch, TVSS shall have an independent means of servicing disconnect such that the protected panel remains energized. A 60A breaker (or larger) may serve this function.
9. SPD shall be installed per manufacturer's installation instructions with lead lengths as short (less than 24") and straight as possible. Gently twist conductors together.
10. Installer may reasonably rearrange breaker locations to ensure short & straightest possible leads to SPDs.
11. Before energizing, installer shall verify service and separately derived system Neutral to Ground bonding jumpers per NEC.

3.2 ADJUSTMENTS AND CLEANING

A. Remove debris from SPD and wipe dust and dirt from all components.

B. Repaint marred and scratched surfaces with touch up paint to match original finish.

3.3 TESTING

A. Check tightness of all accessible mechanical and electrical connections to assure they are torqued to the minimum acceptable manufacture's recommendations.

B. Check all installed panels for proper grounding, fastening and alignment.

3.4 WARRANTY

A. Equipment manufacturer warrants that all goods supplied are free of non-conformities in workmanship and materials for one year from date of initial operation, but not more than eighteen months from date of shipment.

END OF SECTION

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.

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 – Cool White (CW), 5800K nom., CRI > 70
   2. Line Voltage – Universal Voltage 120-277 volts
   3. Governmental Standards – LM79 and LM80 Compliant
   4. 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
   5. Driver – Components must be fully encased in potting material for moisture resistance, and must comply with IEC and FCC standards
   6. Surge Protection – Surge protection must be provided including separate sure protection built into electronic driver
   7. 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 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.

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.

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

PART 1 GENERAL

1.1 SCOPE

A. The Contractor shall furnish and install special systems and accessories as shown on the drawings and/or described herein.

B. Shop drawings shall be submitted for approval and shall include complete catalog data and other data shown to describe the equipment proposed.

1.2 COMMUNICATIONS SYSTEMS

A. Special systems specifications listed in Part 2 of this specification may be found in other specification sections as described herein. The individual specification sections shall be referenced for complete product descriptions.

PART 2 PRODUCTS

2.1 SURVEILLANCE CAMERA SYSTEM

A. The Contractor shall furnish and install a Cat 6 cable for surveillance camera system as described on the drawings. Contractor shall terminate camera station cable to surveillance camera system patch panel in the data cabinet as described on the drawings. Contractor shall complete termination of cable at camera locations. Power for surveillance camera system shall be installed at data closets as shown on drawings. Refer to specification section 27 30 00 for Cat 6 cable description.

B. Cameras to be supplied will include fixed mount inside cameras, exterior cameras, and cameras mounted in elevators. Contractor shall provide traveler cable to be attached to the elevator travel cables for cameras mounted in elevators. Cameras and camera control cabinet shall be provided by Owner.

2.2 FIRE ALARM SYSTEM

A. Refer to specification section 283100 for description of the fire alarm system requirements.

2.3 DATA & TELEPHONE PLANT

A. Refer to specification section 273000 for data and telecommunications system requirements.

2.4 BROADBAND SYSTEM

A. Refer to specification section 274000 for description of the broadband CATV system requirements.

2.5 ACCESS CONTROL SYSTEM

A. Refer to specification section 281600 for description of the security system requirements.

PART 3 EXECUTION

3.1 INSTALLATION

A. Unless otherwise specified, all special systems shall be permanently installed and connected to the wiring system. The systems must be installed according to manufacturer standards and recommendations.

B. The Contractor shall properly support each device, independently from the building structure. Ceiling framing members shall not be used to support devices except for devices specifically intended for such installation.

C. A factory-trained technician shall install the special system equipment. Coordination with the Architect and Owner shall be important for proper positioning of all special systems equipment.

3.2 CONDUIT AND WIRING

A. All special systems wiring shall be run in conduits or other type approved raceways unless specifically noted or allowed otherwise. Horizontal runs of low voltage fire alarm, telephone, data, and controls may be run without a raceway in equipment rooms and accessible ceiling spaces where allowed by code. Surveillance camera wiring shall be considered data wiring.

B. Where run without raceways, cables shall be routed and grouped together utilizing U.L. approved J-hooks attached to the building structure and spaced maximum of 4’-0” in a neat, orderly arrangement. Ceilings considered accessible shall only be those with lay-in panels on T bar grids. Other types of ceilings may be considered accessible if specifically approved as such.

C. Hangers used to support wiring run without raceways shall be Caddy CAT series or B-Line BCH series J-hooks, or other hangers approved with mounting as appropriate to the location. Hangers shall be submitted for approval. Do not use wire wraps or tie straps to support cable. Provide attachment accessory suitable for the substrate the hanger is being attached to.

D. Wiring run without raceways shall be bundled together with reusable Velcro wraps (not

nylon tie wraps) at least once between each 4'-0" support. Wiring must be routed on the supports as high as possible, free and clear of mechanical equipment, lighting fixtures, piping, conduits, ductwork, building structural members, and any other building items.

E. Each wiring system (fire alarm, tele-comm, surveillance camera, etc.) shall be run separate with separate hangers. Do not support from ceiling system supports, HVAC ductwork, conduit, piping, etc.

F. Where wiring run without raceways penetrates walls or ceilings, a metal conduit sleeve with bushings at each end shall be provided for the penetration. Cables shall not be run through in walls or ceilings.

G. Each cable shall be continuous, without splices or connections from the source to the connected device. Routing shall be parallel or perpendicular to building walls. Support arrangement and tension on cables shall be minimized to prevent exceeding the maximum cable bending radius.

H. Where cables transition from sections run without a raceway into sections run with a raceway, a bushing shall be installed on the entrance to the raceway (conduit, surface raceway, etc.).

I. All fire alarm wiring shall have a red colored jacket.

J. Wiring routed without raceways through accessible ceilings or other spaces used for environmental air handling (ceiling spaces used for air return, etc.) shall be listed for the use (plenum rated) and comply with NEC Section 300-22 requirements.

END OF SECTION 27 00 00

PART 1 GENERAL

1.1 SCOPE OF WORK FOR COMMUNICATIONS SYSTEM

A. The Contractor shall furnish labor, materials, and equipment required for the installation of a communication system infrastructure to provide the maximum performance for the system components and subsystems as shown on the Drawings.

1.2 STRUCTURED SYSTEM

A. The infrastructure requires a structured cabling system from general cable forming a channel solution. A channel solution is defined as: The end-to-end transmission path, using a single vendor solution, connecting any two pieces of application-specific equipment. Equipment cables and work area cables are included in the channel. Fiber jumpers and/or data patch cords of appropriate length will be provided for all data drops, switches, and patch panels.

B. The Certified Structured Connectivity Solutions should have as a minimum:
   1. Category 6 for Data and Category 6 for voice wire.
   2. A twenty-year written warranty on material and workmanship.
   3. Work shall be inspected and approved at least two times by the wiring manufacturer's representative - (at rough-in and at final inspection).
   4. All telephone and data wiring work shall be performed by a qualified telecommunications contractor regularly employed in this field. The contracting company performing the telecommunications and data work must have been continuously in the telecommunications business for at least the past five consecutive years.

1.3 QUALITY ASSURANCE

A. All work and equipment shall conform to the appropriate portions of the following specifications, codes and regulations:
   1. Building Industry Consulting Services International (BICSI)
   2. Telecommunications Distribution Methods Manual
   3. ANSI/TIA/EIA Standards:
      a. ANSI/TIA/EIA- 568-B.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 Standards
      d. ANSI/TIA/EIA - 569A- 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/TIA/EIA - 607 (A) - Commercial Building Grounding and Bonding Requirements for Telecommunications
      g. ANSI/TIA/EIA - 526-7 -- Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant.

h. ANSI/TIA/EIA-526-14A -- Measurement of Optical Power Loss of Installed Multimode Fiber Cable Plant.
i. ANSI/TIA/EIA-758(A) -- Customer-Owned Outside Plant Telecommunications Cabling Standard.

4. National Electric Safety Code (NESC)
5. National Fire Protection Agency (NFPA)
6. National Electrical Code (NEC)
7. Any Applicable State and Local Codes.

B. If conflict exists between applicable documents, then the more stringent requirement shall apply.

C. Maintenance Considerations - The cable and wire system shall be installed to maximize the safety, maintainability, and performance effectiveness of maintenance personnel and minimize the demands upon skills, training, and manpower. Splices/terminations shall be placed and supported with convenient accessibility so as to maximize the efficiency and ease with which it can be maintained. No cables shall be spliced unless as shown on plans or approved by the Engineer.

1.5 SHOP DRAWINGS

A. Shop drawings shall be submitted for approval and shall include complete catalog and other information shown to describe the cables, wire, and equipment proposed.

PART 2 PRODUCTS

2.1 DATA STATION CABLES

A. Data station wiring shall be Category 6 (Cat 6) communications wire and cable. Station Cable shall be four-pair, unshielded, twisted pair, inside-station cable, and shall be constructed of solid 24 gauge annealed copper. Each conductor shall be insulated with a continuous layer of fluorinated ethylene propylene (FEP). The sheath shall be all weather, flame resistant, polyvinyl chloride. Station wire shall be constructed of 4 twisted pair sharing one sheath. Cable shall have Category 6 transmission characteristics as specified by ANSI/EIA/TIA-568-B2.1.

B. Cables routed in air plenum shall have a sheath and conductor insulation constructed of material so as to be classified as type CMP as defined by the NEC 800-3(b)(3).

C. Data cable shall be BLUE.

D. Data cabling shall be:
1. General Cable GENSPEED 6500 series, or approved equal

2.2 COMMUNICATIONS OUTLETS

A. Voice and data outlets shall be a modular data communication unit. Wall mounted outlets shall be flush mounted in a double gang utility box and covered with a single gang data

device plates. Complete outlet shall consist of utility box, communication assembly devices, cover plate, and jack inserts. All data outlet inserts shall be eight (8) position/eight (8) conductor, insulation displacement, open system to multi-vendor, EIA/TIA 568-B2.1, Category 6.

B. Outlet shall be furnished with 8-position, Category 6 compliant, RJ-45 modular, gig jacks. Each outlet shall consist of voice or data jack as shown on the Drawings.

C. Cover plates shall be brushed stainless steel and jumbo size.

D. Outlets shall consist of the following items:
1. Double gang outlet box.
2. Plastic cover plate; Electrical Ivory color.
3. Voice and data jack inserts, category 6 compliant: Panduit CJ688TG or approved equal.

E. Each new jack shall be color-coded. Dual jack outlets shall have the top-most, or left-most, jack colored blue and the bottom-most, or right most, jack colored red. Quad jack outlets shall have the top-left-most jack colored blue, the top-right-most jack colored red, the bottom-left-most jack colored green, and the bottom-right-most jack colored EI LABELING REQUIRED.

2.3 PATCH PANELS

A. The patch panels shall support giga-speed transmission for UTP cabling systems utilizing Category 6 performance rated cable. Terminations shall use 110-IDC (Insulating Displacement Connector) field made continuous to the 8-pin modular jack on front of panel via Printed Circuit interconnections. The panel shall mount on nineteen (19") inch rack and be fully EIA/TIA 568-B2.1 compliant. Panels will be T568B wiring. Panels shall be Panduit CPPL24WBLY or CPPL48WBLY or approved equal.

2.4 EQUIPMENT FRAMES

A. General Frame Requirements:
1. Distribution Frames: Freestanding and wall-mounting, modular units designed for telecommunications terminal support and coordinated with dimensions of units to be supported.
2. Module Dimension: Width compatible with 19-inch panel mounting.
3. Panel mounting holes are to be #12-24 tapped on EIA universal spacing on both front and rear of rack.

B. Wall-Mounted Racks: Modular-type, steel construction.
1. Vertical cable management channels, both sides.
2. Racks are to be nominal 30” high, 19" wide, 24” deep.
3. Rack shall have 13 rack units.
4. The rack must be self-supporting with base suitable to floor mount.
5. Must be equipped with a grounding lug.

C. Cable Management for Equipment Frames:
   1. Metal or plastic, with integral wire retaining fingers.
   2. Vertical cable management panels shall have front and rear channels, with covers.

D. Wall mounted racks shall be Chatsworth model 11790-725, or equal.

2.5 CROSS-CONNECT WIRE

A. Cross-connect wire, patch cables, and fiber jumpers shall be furnished and installed by Contractor. Cross-connect and patch cables must be factory certified Category 6 for voice and data wiring. The fiber jumper shall be a duplex, buffered, graded-index fiber, 50/125/900 micron, kevlar yarn over each fiber cladding, and a flame-retardant PVC jacket.

2.6 PATCH CORDS

A. Patch cords shall be provided for each data run indicated on plans. Furnish additional patch cords equal to five percent of the quantity shown. Provide cords of appropriate lengths. For wiring closets provide 5 foot patch cords, and for work station locations patch cords shall be half 10 foot and half 15 foot, appropriate for the wiring solution provided. Patch cords to be installed and dressed from wiring closet to switch. Patch cord color BLUE.

2.7 FIBER CABLES

A. Fiber optic cable installed inside the building shall be a multi-mode fiber cable as shown on the Drawings, 50/125/900 micron, breakout style, riser rated for indoor applications (CMR). Cables shall include twelve (12) strand multimode fiber as shown on the drawings. Each individually jacketed fiber shall contain kevlar strength member to allow direct termination of cable. Cable shall be UL listed and constructed in accordance with EIA/TIA 568 requirements.

B. Fiber optic cables shall meet the following requirements:
Max. attenuation dB/Km @ 850/1300nm: 3.5/1.0
Min. Bandwidth MHz-Km @ 850/1300: 13500/500

C. Fiber cable shall be Systimax LazrSPEED 550, or approved equal.

D. Minimum Six (6) fiber strands shall be run between locations requiring fiber. All Strands will be terminated with LC connectors. Number of strands in cable will be noted for each job.

E. Individual fiber strands shall be color coded per telecommunications industry practice.

2.8 FIBER BREAK-OUT KIT

A. Fiber break-out kits shall be used to terminate fiber into protective buffer tubes. Kit permits separation and protection of individual fiber elements. Kits shall be Corning #FAN-BT47-

06 or approved equal.

2.9 FIBER SHELF

A. Fiber LIUs will be rack mountable in a 19" rack. The LIU shall be sized to accommodate the appropriate number of fiber connections. The LIU at the IDF will have one bulkhead and 1 blank. THE LIU should be Panduit part number FRME4 or approved equal). The LIU at the MDF will have a bulkhead for each IDF. The others will be blank. Fiber cables shall be routed to fiber distribution panels (Panduit FAP6WEIDLC).

A. Fiber distribution panels shall be labeled with each strand marked permanently and appropriately with the corresponding Transmit and Receive the location to which the fiber pair is going.

2.10 FIBER JUMPERS

A. Fiber optic jumper cable shall be a multi-mode, 62.5/125/900 micron, with SC connectors. Fiber connection end will be decided prior to ordering jumpers. Fiber Jumper will be provided for each cable fiber.

2.11 BUILDING PROTECTORS

A. Building protectors shall be 188 Type building cable entrance surge protection terminals that protect personnel and equipment from outside plant cable pairs terminating inside the buildings on the main distribution frames. The 188 Type Protector shall be a combination protector and terminating field with output through a 110 Type Connecting Block. The protectors shall be modular plug-in type, with 110-in/110-out connectivity and grounding lugs as manufactured by AT&T, NTI/Cook, or approved equal.

B. Protector modules shall be plug-in type surge protector modules compatible with modular building protector terminals. The modules shall be gas tube type for the station/BMDF end and gas tube type with sneak current protection for the PBX/MDF end. The modules shall have three (3) element protection, be rated for nominal 400V breakdown, and be color coded black for standard service, and shall be as manufactured by AT&T, NTI/Cook, or approved equal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Unless otherwise specified, all communications systems shall be permanently installed and connected to the wiring system. The systems must be installed according to manufacturer standards and recommendations.

B. The Contractor shall meet with the Engineer, wiring system subcontractor, wiring solution representative and the detention center's technology services representative to review wiring paths. This meeting shall also be used to coordinate the voice/data system installation with the Owner's ordering of electronic equipment required for the facility. This meeting shall also be used to prevent problems with the data wiring during

installation.

C. Test results and as-built documents will be provided to the Owner's Technical Services office in both hard copy and electronic copy, furnished on a CD.

D. Wiring map/as built documents showing voice and data outlets, device numbers, room locations, and termination locations will be displayed in each wiring closet.

E. Wireless drop wiring shall be punched down on a separate punch down block at the end of the data punch down blocks. The wireless punch down block shall be a different color.

F. All fiber runs must be home runs with no splices.

G. Voice and data wiring routed above accessible ceilings shall be supported on J-hooks, and shall be loose bundled using Velcro wraps.

H. Voice and data wire bundles shall not include power wiring or wiring for other low voltage systems (fire alarm, intercom, security, etc.).

I. Cabling installed in underground or under slab conduits shall be suitable for the environment installed and shall be compliant with the structured connectivity solution.

3.2 DATA SYSTEM GENERAL REQUIREMENTS

A. All cables, wires, and equipment shall be securely and neatly installed. Inside routing shall be installed parallel and perpendicular to existing structural lines and members.

B. Each station wire shall be plainly marked at its backboard end with the room number to which it is connected and terminated on the termination blocks or patch panel.

C. Data cables shall be routed above ceilings, with cables neatly bundled. Cables must not be tie-wrapped. No more than 30 cables shall be bundled together.

D. Contractor shall maintain recommended Category 5e/Category 6e bending radius, pulling tension, and cable support requirements. Cables ties may be finger tight, however, not so tight so they distort the outer jacket of the cable.

E. Cable suspended above an open ceiling shall not rest on ceiling tiles or lighting fixtures and shall be supported from roof structure at 4' to 6' intervals.

F. Data system wiring shall be installed in accordance with NEC Article 800-5 and 6 requirements and wiring solution requirements.

3.3 FIBER CABLE INSTALLATION

A. Fiber cables shall be terminated using SC type connectors. Connectors shall be attached using hot melt, ultraviolet, epoxy, heat curable, or crimp methods.

B. All multi-mode fiber cables shall be terminated at both ends and Contractor shall coordinate termination of fibers at source end.

3.4 COMMUNICATIONS SYSTEM QUALIFICATIONS

A. The communications system installer shall be experienced in the design, fabrication and installation of communications premise distribution systems of similar size and scope to this project. Installation technicians shall be manufacturer certified.

B. The Communications Contractor must have installation and service facilities within a 100-mile radius of the project site. All qualifications, including the firm's facilities shall be available for inspection by any school board official.

3.5 CABLE/WIRE IDENTIFICATION

A. Each cable shall be clearly labeled and identified in accordance with the following:
   1. Each cable pair shall be plainly marked at the backboard end on terminal blocks with printed labels. Handwrite labels shall not be permitted.
   2. All outlets shall be permanently marked or labeled with printed type labels on the jack faceplate -- ID number, voice, data.
   3. All cables shall be legibly and permanently numbered at each end using wrap-around/stick-on label systems or approved equal.
   4. In rooms where more than one jack exists, the jacks shall be numbered sequentially using alpha-numeric numbers.
      Labeling in Room/Classroom shall contain:
      a. The room number of wiring closet that drop is terminated.
      b. The drop number. This number should be consecutive numbers by room, by wiring closet. Example: Room 203 with data drops 73 through 75, and voice 2 and 3 all terminated in wiring closet 117. The label in Room 203 would look like:
         R17 – D73-75 (data)
         R17 – V2 & 3 (voice)
   5. Labeling in wiring closet shall contain:
      a. The room number of the room the drop is in.
      b. The drop number. This number should be the numbers by room and by wiring closet. Example: Room 203 would have data drops 73 through 75 and voice 2 and 3 all terminated in wiring closet 17. The label in wiring closet 17 would look like:
         R203 – D73-75 (data)
         R203 – V2 & 3 (voice)
      c. Drop numbering shall start with 1 and continue through 999 by wiring closet.
      d. Layout or wire on punch down block shall be by room number. Drop numbering shall start with 1 and continue through 999 by wiring closet.
   6. All conduits, except those used for individual station jacks, shall be clearly and permanently marked or labeled at both ends, indicating the location of the other end of the conduit.

B. All cable and wiring identification shall be in compliance with ANSI/TIA/EIA 606 Structured Cabling Systems standards.

3.6 DOCUMENTATION AND TESTING

A. Upon completion of construction, the Contractor shall provide "as installed" drawings showing the exact placement of all outlets, cables, conduits and connecting hardware called for in this section. This shall be given in CD form and hard copy form to the owner.

B. Data wiring shall be tested upon completion of installation. Data cables shall contain no defective pairs nor near fails and shall be tested in accordance with Channel Solution standard per TIA/EIA 568-B.

C. The test procedures shall demonstrate, at a minimum:
1. Continuity of each conductor from end-to-end -- open test.
2. Shorted conductors with other conductors -- short test.
3. Proper polarity of paired conductors from end-to-end -- reverse test (for correct tip & ring and data terminations).
4. Proper termination of wire pairs from end-to-end -- cross test (for splits and other wrong terminations).
5. Proper ground and shield bonding (for shielded cables only) -- effective ground test (for zero potential difference bonding).
6. Grounded conductors (for all cables) -- ground fault test.
7. Detection of AC or DC power on any conductor -- power fault test.
8. All data cables shall be tested per EIA/TIA 568-B2.1 Level III requirements.

D. Prior to testing of any communications cable/wire and hardware, the Contractor shall notify the Architect and Engineer, in writing, at least two (2) weeks in advance of testing. Contractor shall furnish hard copy of all test reports to the Architect for approval prior to completion and final acceptance of project.

E. The data system shall be warranted and category 6 compliance certified from the data outlet to the patch panel, and shall be channel certified.

3.7 BONDING AND GROUNDING

A. Grounding and bonding of the communications system shall be in strict accordance with TIA 607, National Electrical Code, and NFPA requirements. Grounding and bonding shown on the drawings represent a minimum requirement.

B. All communications equipment racks that are installed or labeled or in anyway a part of this contract, shall be grounded, isolated from other grounds. The protective ground connection point shall NOT be made to electrical conduits, power distribution box grounds or neutral busses. The intent is to provide telecommunications equipment with a ground which will not be affected by any other electrical work. The ground shall be a #6 AWG solid copper conductor, green insulated ground wire which shall be grounded to the building ground or to contractor installed ground 3/4”/8’, following NEC Codes.

3.8 WALK THROUGH, PUNCH LIST, DOCUMENTATION AND TESTING

A. Before completion of the job, it is the responsibility of the Contractor to request a walk through inspection by Network Administrator. A Punch list will be created and agreed upon. Upon completion of punch list items it is the responsibility of the Contractor to request a Final Inspection.

B. Upon completion of installation, the contractor shall provide a copy of "as installed" drawings showing the number of cables terminated in each room, and the location of patch panel those cables are connected to.

C. Data wiring shall be tested upon completion of installation. A hard copy of the cable test results shall be provided with the "as installed" drawings upon completion of installation.

D. Testing shall be in accordance with the following standards:
ASTM D 4566-98 Standard Test Method for Electrical Performance Properties of Insulation and Jackets for Telecommunications Wire and Cable, 1998
ANSI/TIA/EIA-568-B.2 Commercial Building Telecommunication Cabling Standard, Part 2: Balance Twisted-Pair Cabling Components, 2000.

E. Data cables shall contain no defective pairs.

F. The test procedures shall demonstrate, at a minimum, that all data cables shall be tested per to the most recent proposed EIA/TIA CAT 6 standard

G. Each fiber optic cable shall be tested after installation by the contractor for optical power attenuation. Each LC cable termination may/shall have a maximum of 0.5dB loss, and a total loss of the cable shall be a maximum of 1.0 dB.

H. The Network Specialist will be given the “as installed“ drawings, test results and approve final walk through before final payment will be made.

END OF SECTION

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 devices and be capable of voice evacuation capabilities.

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 WARRANTY

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.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. The following are acceptable manufacturers and series for control panels. No substitutions are allowed.
1. EST3X Series
2. Gamewell E3 Series

B. References to manufacturer's model numbers and other information is intended to establish minimum standards of performance, function, and quality. No other manufacturers, other than those listed will be considered for use on this project.

C. Substitute equipment proposed as equal to equipment specified shall meet or exceed requirements of this section. For equipment other than Gamewell-FCI S3 Series provide proof that such substitute equipment equals or exceeds features, functions, performance, and quality of specified equipment. This proof shall be provided by submission of a copy of specification with each copy of the submittals that has had each paragraph marked as either compliant or non-compliant along with a letter from engineering manager or product manager at factory that certifies information presented as either compliant or non-compliant including a detailed explanation of each paragraph identified as non-compliant. In order to ensure that the Owner is provided with a system that incorporates required survivability features, this letter shall also specifically certify that the system is capable of complying with the test requirements of this section.

2.2 FIRE ALARM SYSTEM

A. Control Panel shall be EST3X or Gamewell E3 Series with integral audio controls inside the cabinet.

2.3 CONTROL PANEL

A. System Cabinet

1. Shall be all metal with a textured finish suitable for surface or semi-flush mounting. Cabinets containing anything non-metal are not acceptable.
2. Front door of steel construction with lockout or dead-front inner door of steel construction to conceal internal circuitry and wiring.
3. Cabinet shall be capable of housing 12 amp hour batteries.
4. Cabinet shall be pre-fabricated to accept all available internal circuitry. Installations with loosely hanging internal panel components will not be accepted.

B. Main Power Supply
1. Shall incorporate the latest power-saving switching technology using no step-down transformers.
2. Shall provide minimum 7 amps of continuous rated output to supply all necessary power under normal and emergency conditions.
3. Shall include an internal battery charger capable of charging up to 55 amp hour batteries while under full load.

C. Batteries
1. Provide U.L. Listed batteries of sufficient capacity to provide power for the entire system automatically upon loss of AC power for a period of 24 hours with 15 minutes of alarm signaling at the end of the 24 hour period.
2. Battery connectors shall be the exact size and type required for the standby battery posts or tabs.
3. Connect batteries to the main panel with minimum 14 AWG stranded hook up wire. Red for positive and black for negative. Use fully insulated crimp style connectors.

D. Battery Cabinets
1. Provide U.L. listed metal battery cabinet and enclosures with key lockable door for installations requiring batteries too large to be housed in control panels.
2. Battery cabinet shall be textured painted to match the control panel it is housing the batteries for.

E. Display
1. Main control panel shall include a color touch screen display for user interface.
2. Display shall be capable of a minimum 200 characters.
3. The touch screen communications shall be textual RS-485 based with the capability of being mounted locally or remotely.
4. The display shall provide both audible and visual annunciation of all system events.
5. Separate LED's shall be dedicated for:
    a. AC (normal power): Green
    b. Fire: Red
    c. Hazard: Blue
    d. Supervisory: Yellow
    e. Trouble: Yellow
    f. Silenced: Yellow
6. Pre-programmed keys shall be on board for:

a. Menu
b. Fire Drill
c. System Reset

7. Display shall contain a minimum 5 keys that can be custom programmed for system functions
8. The display shall be suitable to be remotely installed as a remote annunciator up to 3,000 feet away from the main CPU cabinet. The remote display shall be available with a manufacturer's custom metal cabinet suitable for surface or semi flush installation complete with a lockable see through door and textured finish matching the main control cabinet.

F. Main System CPU

1. System CPU shall incorporate a 32-bit RISC multiprocessor design on a single circuit board. An isolated watchdog circuit shall monitor the microprocessor and shall activate system trouble on the display upon any failure. The system program shall not be lost upon any loss of power. The CPU software shall support control-by-event (CBE) programming using Boolean logic including AND, OR, NOT, XOR and TIMING functions to provide complete custom programming flexibility. An auto programming option shall be available where only devices that are present on the SLC shall activate.
2. System shall be programmed via the manufacturer's proprietary field configuration program (FCP), allowing the project configuration custom programming to be uploaded and downloaded via a portable laptop computer at the project.
3. An RJ-45 Ethernet port shall be provided to accept downloaded programs from a portable computer, or provide 80-column readout of all alarms, troubles, location descriptions, time, and date. Communication shall operate at 10/100 speeds.
4. An on-board supervised RS-232C Serial Output shall be included to operate remote printers and video terminals.
5. The system CPU shall include an on-board supervised RS-485 Serial Output for connection and communication to system modules. The RS-485 port shall allow for communication with remote annunciator modules up to 3,000' from the cabinet.
6. Smoke detector alarm verification shall be a standard software option while allowing other devices such as manual stations and sprinkler flow to create immediate alarms. This feature shall be selectable for smoke sensors that are installed in environments prone to nuisance or unwanted alarms.
7. Standard software shall provide for the analog drift compensation of smoke detectors allowing each smoke detector to automatically adjust its sensitivity to accommodate changes caused by the effects of component aging or its surrounding environment including dust. Each sensor shall maintain its actual sensitivity under adverse conditions to respond to alarm conditions while ignoring factors which generally contribute to nuisance alarms. System trouble circuitry shall activate, display smoke detectors that require cleaning and maintenance.
8. System software shall automatically test each analog smoke sensor a minimum of 3 times daily. Test shall be a recognized functional test of each photocell (analog photoelectric sensors) and ionization chamber (analog ionization sensors) as required annually by NFPA 72. Failure of sensor test shall activate system trouble circuitry, display "Test Failed" indication, and identify individual device that failed.

9. The system control panel shall be capable of setting any detector or sensor into Positive Alarm Sequence mode. Positive Alarm Sequence will operate in the following manner. Any alarms received from a device will activate an alarm at the control panel but will not execute any output functions (e.g. turning on the strobes or fire horns). The operator has 30 seconds to "acknowledge" the event or the system will activate a general alarm and sound all the fire horn and strobes. If the operator does acknowledge the vent within thirty (30) seconds, the panel will start a timer for 180 seconds (3 minutes) in which time the operator must find the device in alarm and reset the device. If the operator has not performed a reset within 180 seconds or a second device reports an alarm, the system will immediately sound the general alarm.
10. The CPU display shall have the option of being configured as an additional remote annunciator. This annunciator shall be mounted in its own metal cabinet with lockable door.
11. The CPU shall maintain a 4100 event history log. The log shall be maintained upon loss of any power.
12. 24 volt D.C. power-limited 1 amp outputs shall be provided for both resettable and non-resettable power. The outputs shall be screw terminal on board the CPU board.
13. Manufacturer's standard software shall accommodate a 1 man walk test feature.

G. Signaling Line Circuits
1. Provide 1 SLC loop for this project. Projects including more than 1 floor shall include a second SLC loop. Each SLC shall be capable of being wired Class B Style 4 or Class A Style 6 and shall operate in NFPA Style 7 configuration when equipped with isolator modules.
2. Each SLC shall accommodate a maximum 159 analog sensors and 159 monitor/control devices.

H. Notification Appliance Circuits
1. The CPU shall include a minimum 4 on-board polarized NAC circuits rated at 2 amps DC each. Each NAC shall be capable of being wired Class B, Style Y or Class A, Style Z.

I. Dry Contacts
1. Form C dry contacts with a 2 amp at 30VDC resistive rating shall be included on-board the CPU for alarm, trouble and supervisory events.

J. DACT
1. Fire alarm control panel shall include a Digital Alarm Communicator Transmitter (DACT) for signaling to central station. DACT shall contain "Dialer-Runaway" feature preventing unnecessary transmissions as result of intermittent faults in system and shall be Carrier Access Code (CAC) compliant, accepting up to 20-digit central station telephone numbers. Fire department shall be consulted as to authorized central station companies serving municipality. Fire alarm system shall transmit both alarm and trouble signals, with alarm having priority over trouble

signal. Contractor shall be responsible for all installation charges and Owner will be responsible for line lease charges

2. DACT shall be a U.L. listed internal component of the main control panel and shall be capable of transmitting specific detailed point by point system events to the monitoring station.
3. Systems using external standalone digital communicators will not be accepted.

K. Cellular/IP COMMUNICATOR

1. Provide a dual path commercial fire communicator as part of this project.
2. Acceptable manufacturers:
3. Fire-Lite Alarms Model IPGSM-4G by Honeywell. All equipment must be available "over the counter" through security equipment distributor network markets and can be installed by dealerships who are independent of the manufacturer. No substitutions allowed.
4. The central station's supervisory equipment shall be Honeywell's AlarmNet Network Control Center.
5. Contract the services of a monitoring company sub-contractor or distributor to provide, program the communicator and provide monitoring of the system.
6. The communicator shall use the internet or GSM cellular network as a primary transmission format.
7. IPGSM-4G Communicator is connected to any Fire Alarm Control Panel DACT telephone ports, the system shall be capable of transmitting Contact ID formatted alarms, supervisory or troubles to a Honeywell's AlarmNet Network Control Center equipped with a Honeywell AlarmNet receiver via Ethernet over a private or public WAN/LAN, Intranet or Ethernet.
8. The IPGSM-4G Communicator shall include connections to the Fire Alarm Control Panel's phone outputs and shall convert the contact ID protocol into Ethernet Packets.
9. The IPGSM-4G Communicator shall be completely field-programmable locally from a 7720P Programming Tool.
10. The IPGSM-4G Communicator shall be capable of transmitting events in contact ID format.
11. Communication shall include vital system status such as:
    a. Independent Zone (Alarm, trouble, non-alarm, supervisory)
    b. Independent Addressable Device Status
    c. AC (Mains) Power Loss
    d. Low Battery and Earth Fault
    e. System Off Normal
    f. 24 Hour Test Signal
    g. Abnormal Test Signal (per UL requirements)
12. The IPGSM-4G Communicator shall support independent zone reporting via the Contact ID format. This format shall enable the central station to have details concerning the location of the fire for emergency response. The IPGSM-4G Communicator shall be capable of providing simulated phone lines to the Fire Alarm Control Panel. The IPGSM-4G Communicator shall communicate over IP or GSM primary and shall be transparent to the Fire Alarm Control Panel normal operation over phone lines.

2.4 PRINTERS

A. A printer shall not be required for this project.

2.5 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.

2.6 VOICE EVACUATION PANEL

A. Provide a standalone voice evacuation panel from one of the approved manufactures:
   1. Edwards
   2. Honeywell

B. The voice evacuation panel shall be a single assembly complete with metal lockable enclosure, power supply, amplifier, audio controller board and supervised hand-held microphone.

C. Provide a system with 4 on-board circuits capable of supervising U.L. listed speakers.

D. The amplifier shall provide a minimum of 50 watts of output power on either 25 or 70.7 Vrms circuits.

E. The panel shall support a minimum of two pre-recorded messages and have the capability of adding application specific messages through the use of a P.C.

F. The system audio notification emergency message shall initiate automatically from a supervised D.C. polarity reversing fire alarm notification appliance circuit.

G. The power supply shall be capable of charging up 18 amp hours batteries.

H. The audio controller board shall be complete with form C dry trouble and alarm contacts, and LED's for the following:
   1. Speaker circuit trouble
   2. Alarm
   3. Microphone trouble
   4. Ground fault
   5. Low battery
   6. Power fail

I. The system shall be available with a U.L. listed remote microphone accessory manufactured for the system.

2.7 SYSTEM PERIPHERALS

A. Every devices 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. Shall be fully listed and compatible with the furnished system.
   2. Each detector shall be provided with 2 status LEDs that shall flash under normal conditions and remain steady during alarm conditions.

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. Duct Detectors
   1. Duct detectors shall be System Sensor DNR or DNRW Series housings.
   2. Housings and all the related accessories listed below shall be provided for the each of the following:
      a. On the ductwork of every supply branch of every HVAC air handling/rooftop unit exceeding 2,000 CFM
      b. 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.

c. 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.

3. The housing shall include the listed addressable photoelectric smoke detector head which shall twist in and lock inside the housing.
4. 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.
5. 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.
6. Provide one addressable relay module for each HVAC required function including:
   a. AHU Shutdown
   b. Smoke damper operation
   c. Smoke sequence/exhaust/pressurization operations
7. System designs incorporating hardwired, conventional relays for any mechanical functions are not allowed and will be subsequently rejected.

E. 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.

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 system shall utilize speakers for audible alarm notification. The speakers shall be listed to UL 1480 for Fire Protective Signaling Systems. It shall be a dual-voltage transformer speaker capable of operation at 25.0 or 70.7 nominal Vrms. The speaker shall have a frequency range of 400 to 4,000 Hz. The speaker shall be capable of mounting to a standard 4x4x2 1/8 electrical box. The speaker shall have power taps from ¼ watt to 2 watts and voltage output selectable via rotary switches. The speaker shall have a maximum sound output of 86 dB at 10 feet. Provide System Sensor Spectralert SPS Series speakers and speaker strobe devices.
9. The horn strobe 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.
10. Provide manufacturer's surface mount and weatherproof backboxes where required.

2.7 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.

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

SECTION 31 3116
TERMITE CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Chemical soil treatment.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Vapor barrier placement under concrete slab-on-grade.

1.03 REFERENCE STANDARDS

A. Title 7, United States Code, 136 through 136y - Federal Insecticide, Fungicide and Rodenticide Act; 2006.

1.04 SUBMITTALS

A. See Section 01 3000 - Submittal Procedures.

B. Product Data: Indicate toxicants to be used, composition by percentage, dilution schedule, intended application rate.

C. Test Reports: Indicate regulatory agency approval reports when required.

D. Manufacturer's Certificate: Certify that toxicants meet or exceed specified requirements.

E. Certificate of compliance from authority having jurisdiction indicating approval of toxicants.

F. Warranty: Submit warranty and ensure that forms have been completed in Owner's name.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing this type of work and:
   1. Having minimum of three (3) years documented experience.
   2. Approved by manufacturer of treatment materials.
   3. Licensed in the State in which the Project is located.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide five year installer's warranty against damage to building caused by termites.

PART 2 PRODUCTS

2.01 CHEMICAL SOIL TREATMENT

A. Toxicant Chemical: EPA Title 7, United States Code, 136 through 136y approved; synthetically color dyed to permit visual identification of treated soil.

B. Manufacturers:
   1. Bayer Environmental Science Corp: www.backedbybayer.com/pest-management.
   2. FMC Professional Solutions: www.fmcprosolutions.com.
   3. Syngenta Professional Products: www.syngentaprofessionalproducts.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

C. Toxicant Chemical: EPA ({\rs\#1}) approved; synthetically color dyed to permit visual identification of treated soil.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that soil surfaces are unfrozen, sufficiently dry to absorb toxicant, and ready to receive treatment.

B. Verify final grading is complete.

3.02 APPLICATION - CHEMICAL TREATMENT

A. Comply with requirements of U.S. EPA and applicable state and local codes.

B. Spray apply toxicant in accordance with manufacturer's instructions.

C. Apply extra treatment to structure penetration surfaces such as pipe or ducts, and soil penetrations such as grounding rods or posts.

D. Re-treat disturbed treated soil with same toxicant as original treatment.

E. If inspection or testing identifies the presence of termites, re-treat soil and re-test.

3.03 PROTECTION

A. Do not permit soil grading over treated work.

END OF SECTION

SECTION 321220
BASE COURSE AGGREGATES

PART 1 - GENERAL

1.1 SUMMARY

A. Products supplied under this section:

1. Crushed limestone and concrete
2. Geotextile separation fabric

B. Related Requirements:

1. Section 033000 Cast-in-Place Concrete
2. Section 072600 Vapor Retarders
3. Section 31200 Earth Moving
4. Section 321313 Concrete Paving

1.2 REFERENCES

A. LA DOTD (Louisiana Department of Transportation and Development)

1. 2016 Standard Specifications for Roads and Bridges Manual

1.3 ACTION SUBMITTALS

A. Product Data:

1. Geotextiles, including manufacturer's written instructions.

B. Material Test Reports

1. Documentation indicating product and gradation satisfy the requirements of LA DOTD Section 1003.03.1 "STONE" and/or Section 1003.03.2 "RECYCLED PORTLAND CEMENT CONCRETE".
2. Optimum Moisture Content as per ASTM D 698.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

1.5 FIELD CONDITIONS

A. Proceed only when all proceeding work, including but not limited to subgrade preparation and earthwork, have been completed satisfactorily.

PART 2 - PRODUCTS

2.1 CRUSHED STONE AND CRUSHED RECYCLED PORTLAND CEMENT CONCRETE

A. LA DOTD Section 1003.03.1 “STONE“ and/or Section 1003.03.2 “RECYCLED PORTLAND CEMENT CONCRETE”. Available commercially as “610 Roadbase”

2.2 SEPARATION GEOTEXTILE

A. Products are limited to the following:

1. Mirafi 600X by Tencate
2. Geotex 315ST by Propex Geosolutions
3. No substitutions

PART 3 - EXECUTION

3.1 PREPARATION

A. Ensure that the subgrade and/or fill material is approved by Engineer.

3.2 INSTALLATION

A. Separation Geotextile

1. Grade area to be covered smooth; remove any foreign materials and lumps of soil that would contaminate the base course or interfere with the installation of the geotextile fabric.
2. Install geotextile separation fabric in strict accordance with manufacturers written instructions.

B. Crushed Stone / Concrete

1. After fabric is in place, install crushed limestone in six inch (maximum) lifts and in accordance with applicable portions of Section 312000 “Earth Moving.” Compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 90 percent of maximum dry unit weight according to ASTM D 698. Grade smooth and roll after each lift is installed.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified geotechnical engineering testing agency to perform tests and inspections.

B. Allow testing agency to inspect and test each lift. Testing agency to document:

1. Thickness of lifts
2. Compaction of material as per ASTM D 698

3.4 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus and waste materials and legally dispose of them off Owner's property.

END OF SECTION 32 1220

SECTION 32 1313
CONCRETE PAVING

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 Concrete Paving, including the Following:

1. Driveways.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for general building applications of concrete.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with fly ash.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: For each type of product, ingredient, or admixture requiring color selection.

C. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

D. Reinforcement Fabrication Drawings: For all areas of paving. Include plans and details of sufficient development to accurately and clearly convey the size, length, geometry and location of each individual piece or rebar. Notes added to the construction documents are not acceptable will be rejected without review.

E. Joint Materials: For each type of joint.

F. Concrete Parking Bumpers and fasteners

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified ready-mix concrete manufacturer and testing agency.

B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Admixtures.
4. Curing compounds.
5. Applied finish materials.
6. Bonding agent or epoxy adhesive.
7. Joint fillers.

C. Material Test Reports: For each of the following:

1. Aggregates: Include service-record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

D. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94 requirements for production facilities and equipment.

B. Testing Agency Qualifications: Qualified according to ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified independent testing agency to perform preconstruction testing on concrete paving mixtures.

1.8 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. Concrete is not to be placed is temperature is below or expected to fall below 40 deg F. Place concrete only when temperature is 40 deg F or higher and rising.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

C. Hot-Weather Concrete Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless otherwise indicated.

2.2 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

A. Plain-Steel Welded-Wire Reinforcement: ASTM A1064, fabricated from as-drawn steel wire into flat sheets.

B. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064, flat sheet.

C. Reinforcing Bars: ASTM A615, Grade 60; deformed.

D. Steel Bar Mats: ASTM A184; with ASTM A615, Grade 60 deformed bars; assembled with clips.

E. Plain-Steel Wire: ASTM A1064, as drawn.

F. Deformed-Steel Wire: ASTM A1064.

G. Joint Dowel Bars: ASTM A615, Grade 60 plain-steel bars. Cut bars true to length with ends square and free of burrs.

H. Tie Bars: ASTM A615, Grade 60; deformed.

I. Hook Bolts: ASTM A307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

J. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

2.4 CONCRETE MATERIALS

A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C150, gray portland cement, Type I/II.

2. Fly Ash: ASTM C618, Class F.

B. Normal-Weight Aggregates: ASTM C33, uniformly graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 1 inch nominal.

2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Air-Entraining Admixture: ASTM C260.

D. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C494, Type A.
2. Retarding Admixture: ASTM C494, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C494, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017, Type II.

E. Water: Potable and complying with ASTM C94.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry or cotton mats.

B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. BASF Corporation.
    b. Dayton Superior.
    c. Euclid Chemical Company (The); an RPM company.
    d. Sika Corporation.

E. White, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 2, Class B, dissipating.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Dayton Superior.
    b. Euclid Chemical Company (The); an RPM company.
    c. W.R. Meadows, Inc.

2.6 RELATED MATERIALS

A. Joint Fillers: ASTM D1751, asphalt-saturated cellulosic fiber in preformed strips.

B. Joint Keyways: 24 Gauge, galvanized material with removable cap for installation of joint filler.

C. Bonding Agent: ASTM C105, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy-Bonding Adhesive: ASTM C881, two-component epoxy resin capable of humid curing and bonding to damp surfaces; of class suitable for application temperature, of grade complying with requirements, and of the following types:

1. Types I and II, non load-bearing and Types IV and V, load-bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.7 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 211.1 and ACI 301 for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.

2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that comply with or exceed requirements.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 15 percent.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content: 5 percent plus or minus 1-1/2 percent for 1-inch nominal maximum aggregate size.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture; high-range, water-reducing admixture; high-range, water-reducing and retarding admixture; and plasticizing and retarding admixture in concrete as required for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

F. Concrete Mixtures: Normal-weight concrete.

1. Compressive Strength (28 Days): 3000 psi.

2. Maximum W/C Ratio at Point of Placement: 0.50.
3. Slump Limit: 5 inches, plus or minus 1 inch.

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C94. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

2.9 CONCRETE PARKING BUMPERS

A. Concrete Wheel Stops: Precast, steel-reinforced, air-entrained concrete, 2500-psi minimum compressive strength, approximately 6 inches high by 9 inches wide by 84 inches. Provide chamfered corners, transverse drainage slots on underside, and a minimum of two factory-formed or -drilled vertical holes through wheel stop for anchoring to substrate.
1. Surface Appearance: Free of pockets, sand streaks, honeycombs, and other obvious defects. Corners shall be uniform, straight, and sharp.

2. Mounting Hardware: Galvanized-steel spike or dowel, 3/4-inch diameter, 10-inch minimum length or hardware as standard with wheel-stop manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding. Conform to requirements in Section 31200 “Earth Moving”.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.

2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck.
3. Correct subbase with soft spots and areas of excessive pumping or rutting according to requirements in Section 312000 "Earth Moving." Engineer's prior written approval required for any and all excavations in excess of the contract amount. Unapproved excavations will be at no additional cost to the owner.

C. Install backfill, fill, geotextile separation and subbase course according to requirements in Section 31200 "Earth Moving".

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded-wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

2. Wood materials will not be permitted for use as any type of joint and any construction using wood material at joints of any type will be rejected outright.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 80 feet unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows

1. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Provide a (minimum) 6 mil polyethylene barrier at all locations. For any areas not to receive the polyethylene barrier (as indicated on the drawings or as directed by the Engineer), moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period, using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 3/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-feet long; unleveled straightedge not to exceed 1/2 inch.
4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch.
6. Vertical Alignment of Dowels: 1/4 inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
8. Joint Spacing: 3 inches.
9. Contraction Joint Depth: Plus 1/4 inch, no minus.
10. Joint Width: Plus 1/8 inch, no minus.

3.10 PARKING BUMPERS

A. Securely attach wheel stops into pavement with not less than two galvanized steel dowels embedded in holes cast into wheel stops. Firmly bond each dowel to wheel stop and to pavement. Extend upper portion of dowel 5 inches into wheel stop and lower portion a minimum of 5 inches into pavement.

B. Paint as required with specified paint or otherwise with paint compatible with parking bumper surface.

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. of concrete or 5000 sq. ft. of surface area of slab or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C1064; one test hourly when air temperature is 80 deg F and above, and one test for each composite sample.

5. Compression Test Specimens: ASTM C31; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C39; test one specimen at seven days and two specimens at 28 days; maintain one specimen in reserve.

    a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.

3.12 REPAIR AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Engineer.

B. Drill test cores, where directed by Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 1313

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