



**PRELIMINARY
GEOTECHNICAL ENGINEERING REPORT
SACRED HEART CATHOLIC CHURCH
300 SOUTH RIDGEVIEW DRIVE
WARRENSBURG, MISSOURI**

Prepared For:

DIOCESE OF KANSAS CITY-ST. JOSEPH REAL ESTATE CORPORATION
20 West Ninth Street
Kansas City, Missouri 64105

Prepared By:

KAW VALLEY ENGINEERING, INC.
14700 West 114th Terrace
Lenexa, Kansas 66215

September 28, 2026

Project No. **C26G2801**



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September 28, 2026

C26G2801

Mr. Andy Gilmore
Diocese of Kansas City-St. Joseph Real Estate Corporation
20 West Ninth Street
Kansas City, Missouri 64105

**RE: PRELIMINARY GEOTECHNICAL ENGINEERING REPORT
SACRED HEART CATHOLIC CHURCH
300 SOUTH RIDGEVIEW DRIVE
WARRENSBURG, MISSOURI**

Dear Mr. Gilmore:

This report presents the results of a subsurface exploration and geotechnical engineering analysis conducted for the referenced project. This exploration was conducted in general accordance with our proposal dated August 5, 2026. Authorization to proceed was provided August 20, 2026. The purpose of this study was to define the subsurface conditions at the site and develop geotechnical parameters related to design and construction of the project.

EXECUTIVE SUMMARY

Information, conclusions, and recommendations which, in our opinion, are significant to the design and construction of this project, are provided below. Additional details, the general subsurface profile, other related items, and general information regarding the various phases of our exploration are included in the main body of the report.

Typical subsurface conditions consist of clay fill and clay overlying shale and limestone bedrock. Based upon the conditions encountered during exploration, KVE recommends that the building be supported on shallow footings bearing upon the existing clay soils, newly placed fill, or a combination of both. **A net allowable bearing pressure of 2,000 pounds per square foot (psf) may be used to design and proportion footings for the building.**

PROJECT AND SITE DESCRIPTION

The proposed project is located at 300 South Ridgeview Drive in Warrensburg, Missouri. At the time of the geotechnical exploration, the subject property consisted of the existing church structure and the associated parking area. Multiple trees are present on the subject property. The subject property slopes down to the south. Based on the available historical photographs, the existing structure was constructed sometime between 1997 and 2003.

The proposed project consists of the construction of a one-story, 16,000 square foot, pre-engineered metal building with associated parking lots and drives. The final location and finish floor elevation of the proposed building was not known at the time of this report; however, it is anticipated that a minimum of 5 feet of cut and/or fill may be required for this project based on the slope of the property. KVE should be informed if more than 5 feet of fill will be required as this may result in potential settlement issues related to soft zones encountered during the field exploration. Anticipated maximum structural loads are 30 kips for columns and 2 kips per linear foot for load bearing walls. The site and surrounding area are displayed on Plate 1.

FIELD EXPLORATION

The purpose of this exploration was to determine the feasibility of the two proposed building location options on the subject property. Once the location has been selected, the final building design should be reviewed by KVE, and additional borings may be required.

The field exploration was performed during a period from September 3 to 8, 2026, and included drilling nine test borings, identified as Borings A-1 through A-5, and Borings B-1 through B-4. The borings were separated into groups in order to independently evaluate the subsurface conditions of two different locations on the same subject property. Each group of borings were performed for a potential building location. Borings A-1 through A-5 were performed adjacent to the existing building, while Borings B-1 through B-4 were performed in the existing parking area. The boring locations and boring identifications were selected by the client. The boring elevations were determined using rod and level surveying. The finish floor of the main entrance of the existing building was used as a benchmark with an assigned elevation of 100.0 feet. The boring locations are displayed on Plate 1 and the elevations are shown on the logs of the borings.

The borings were drilled using a truck-mounted CME 55 drill rig, with 4-inch O.D. continuous flight augers. Samples were obtained utilizing thin-walled steel (Shelby) tubes and a split-barrel sampler (standard penetration test). Soil samples were obtained at various intervals through the depths of the borings. The borings were drilled to depths ranging from 12.2 to 20.0 feet below the existing ground surface. Detailed logs of the borings are displayed on Plates 2 through 10.

The borings were logged in the field by a geologist, based upon visual classifications of materials encountered during drilling, as well as the driller's interpretation of the subsurface conditions between samples. Final boring logs included with this report represent the engineer's interpretation of the field logs and include revisions based upon results of the laboratory testing and an engineer's review of the soil samples.

SUBSURFACE CONDITIONS

Stratigraphy. Typical subsurface conditions consist of up to 10 feet of clay fill overlying lean (low plasticity) and fat (high plasticity) clays, which in turn are overlying shale and limestone bedrock. The existing fill material consists of lean clays, silt, shale fragments, and limestone fragments. Additionally, very soft material was encountered in Boring B-3 to a depth of 15.0 feet below the existing ground surface. Shale and limestone bedrock were encountered at depths ranging from 5.0 to 12.5 feet below existing ground surface.

Groundwater. Groundwater was encountered in the majority of borings at depths ranging from 5.0 to 18.5 feet below existing ground surface. Groundwater was not encountered in Borings A-1, B-1, and B-2. It should be understood that the level of the groundwater may fluctuate due to rainfall and other climatic factors, and that groundwater may or may not be present during construction or at other times during the life of the project.

Due to the high groundwater encountered in Boring A-4, consideration should be given to installing an underdrain system if this location is chosen for the proposed building.

LABORATORY TESTING PROGRAM

The laboratory testing program was designed to determine the pertinent engineering and index properties of the soil. Moisture content, in-situ density, Atterberg limits, and unconfined compressive strength were determined for select samples. Results of the laboratory tests are displayed upon the borings logs. All tests were performed in general accordance with applicable ASTM standards.

Moisture contents for the samples ranged from 11.6 to 54.0 percent, with in-situ dry densities varying from 98.3 to 115.5 pounds per cubic foot. The samples had unconfined compressive strength test results ranging from 2,184 and 11,316 pounds per square foot. Atterberg limits tests indicated the upper site soils classify as lean (CL) and fat (CH) clays and silt (ML) in general accordance with the Unified Soil Classification System. These soils typically have low to high swell potentials.

DESIGN CONSIDERATIONS AND RECOMMENDATIONS

The recommendations submitted herein are based, in part, upon data obtained from our subsurface exploration. The nature and extent of subsurface variations that may exist at the proposed project site will not become evident until construction. If variations appear evident, then the recommendations presented in this report should be evaluated. In the event that any changes in the nature, design, locations or depth of the proposed project are planned, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and our recommendations modified in writing.

Site Preparation. Initial site preparation for the proposed project should commence with demolition of the existing structure and/or parking area within the proposed construction area. Demolition of existing buildings and pavement should include removal of at grade floor slabs, sidewalks and shallow spread footings. All potential basement walls should be removed to the top of the foundations. Potential basement footings and basement floor slabs could be left in place if they would not interfere with the installation of utilities or other construction. The potential basement floor slabs should be broken to allow for the percolation of groundwater. All broken concrete and other debris from demolition of the structure and/or parking area should be removed from the site. Areas disturbed during demolition of the existing structures should be thoroughly evaluated by the geotechnical engineer prior to placement of structural fill. All disturbed soils should be undercut prior to placement of structural fill.

Site preparation for the proposed project should continue with stripping of all vegetation and topsoil from the building and pavement areas. A minimum stripping depth of approximately 12 inches should be anticipated. However, stripping depths will likely vary and should be adjusted to remove all vegetation and root systems. Soils removed during site stripping operations could be used for final site grading outside the proposed building and pavement areas.

The existing fill at this site should be thoroughly evaluated as this material varied significantly in moisture content, consistency, and density. Soft or unstable areas should be undercut and replaced with structural fill. If required, the exposed grade should be moisture conditioned prior to placement of structural fill.

Relocation of any existing utility lines within the zone of influence of proposed construction areas should also be completed as part of the site preparation. The lines should be relocated to areas outside of the proposed construction. Excavations created by removal of the existing lines should be cut wide enough to allow for use of heavy construction equipment to recompact the fill. In addition, the base of the excavations should be thoroughly evaluated by a geotechnical engineer or engineering technician prior to placement of fill. All fill should be placed in accordance with the recommendations presented in the *Structural Fill* section of this report.

Any required tree removal should also be accomplished at this time. Care should be taken to thoroughly remove all root systems from the proposed building area. Materials disturbed during removal of stumps should be undercut and replaced with structural fill. A zone of desiccated soils may exist in the vicinity of the trees. The desiccated soils have a higher swell potential and should also be undercut and replaced with structural fill.

Additionally, depending on which location is selected for the proposed building and planned finish floor elevation, overexcavation of on-site materials may be required. Extremely soft soils were encountered in Boring B-3 and extend to a depth of 15.0 feet below existing ground surface. If the planned finish floor is near the existing grade for Boring B-3, KVE recommends a minimum overexcavation of 10 feet of existing material. Structural fill should be used to replace the overexcavated material. Additional borings should be considered to determine the extent of this extremely soft zone.

Following demolition, stripping, and cutting to grade, the exposed soils should scarified, moisture conditioned, and recompact. The moisture content of the exposed grade should be adjusted to within the range recommended for structural fill to allow the exposed material to be compacted to a minimum density of 95% of maximum density as determined by the standard Proctor compaction procedure. Extremely wet or unstable areas that hamper compaction of the subgrade may require undercutting and replacement with structural fill or other stabilization techniques. Suitable structural fill should be placed to design grade as soon as practical after reworking the subgrade to avoid moisture changes in the underlying soils.

Structural Fill. All imported and structural fill should consist of approved materials, free of organic matter and debris. Structural fill should consist of low volume change (LVC) materials. LVC consist of either cohesive or non-cohesive materials. Cohesive LVC soils are defined as having a liquid limit less than 45 percent and a plasticity index between 10 and 25 percent. The

majority of the on-site soils meet the requirements for LVC soils. As an alternative to using cohesive LVC material, MoDOT Type 5 aggregate base or similar well graded gravel may be utilized as imported non-cohesive LVC fill.

Fill material should be placed in lifts having a maximum loose lift thickness of 8 inches. All fill should be compacted to a minimum of 95 percent of the material's maximum dry density as determined by ASTM D 698 (Standard Proctor compaction).

The moisture content of the fill at time of compaction is dependent upon the type of fill material being placed. For cohesive LVC fill material or the well graded gravel, the moisture content of the material should be within a range of 2 percent below to 2 percent above optimum moisture content as defined by the Standard Proctor compaction procedure.

Moisture contents for cohesive materials should be maintained until completion of the slab, whereas the moisture content for the well graded gravel does not need to be maintained.

The geotechnical engineer should approve all fill material. Approval requires that a moisture-density relationship and Atterberg limits be performed for each proposed material prior to its use in the structural fill.

All utility trenches should be backfilled with either on-site or imported fill material. Granular materials such as clean sand or gravel should not be used to bed utilities or backfill trenches unless the bottom of the trench is graded so that water flows away from the structure and pavement areas.

Where fill is being placed on a slope steeper than 5:1 (horizontal:vertical), the existing slope should be benched as fill placement progresses. These benches should be stepped vertically between 12 and 36 inches. This procedure would better key the fill into the original slope and will facilitate compaction of the fill.

Final slopes greater than 3:1 (horizontal:vertical) should not be used for ease of maintenance.

Continuous observation by the geotechnical engineer or his representative should be maintained during site preparation and compaction of all fill and backfill material.

Foundations. On the basis of the anticipated maximum loading conditions, structural loads for the building may be supported by a combination of isolated shallow spread and strip or trench footings founded entirely upon the existing clay soils, newly placed fill, or a combination of both. A net allowable bearing pressure of 2,000 psf may be used to design and proportion these footings.

The base of exterior footings and interior footings in unheated areas should be placed a minimum of 3 feet below the lowest adjacent exterior grade for frost protection.

Isolated footings should have a minimum width of 24 inches. Strip and trench footings should have minimum widths of 18 and 12 inches, respectively. The base of footing excavations should be free of all water, loose debris, and not allowed to become excessively wet or dry prior to placement of concrete.

All footing excavations should be observed by the geotechnical engineer of record or a representative to verify the suitability of the bearing material prior to placement of reinforcing steel.

Uplift. Uplift forces, if any, may be resisted by the weight of the footings.

Lateral Loads. A coefficient of base friction of 0.25 may be used for the contact between concrete and compacted structural fill or undisturbed foundation soils.

Lateral Pressures. Unrestrained walls below grade should be designed for an equivalent active fluid pressure of 45 psf/ft. Restrained walls below grade should be designed for an “at-rest” equivalent fluid pressure of 65 psf/ft. These pressures assume no hydrostatic loads are allowed to build up behind the walls, and do not include a factor of safety.

Slab-On-Grade. The slab-on-grade should be designed such that axial column loads are not transferred through the slab. A 4-inch layer of open graded gravel (ASTM C33 No. 57) should be placed directly below the slab-on-grade. A moisture barrier should be placed between the slab and the open graded gravel. Soils within 12 inches below the slab-on-grade should meet the requirements for lower plasticity cohesive soil (also referred to as low volume change (LVC) soil). We recommend that the slab-on-grade be designed for a modulus of subgrade reaction of 125 pounds per cubic inch.

Thickened slab sections can be used to support interior non-load bearing walls provided that:

- Loads do not exceed 900 pounds per linear foot.
- Thickened sections have a minimum thickness and width of 8 inches and 12 inches, respectively.
- Thickness and reinforcement are consistent with structural requirements.

Seismic Soil Classification. According to the 2018 International Building Code, the site soils are best characterized by the “Class D” site classification. This classification can be utilized by the structural engineer as a seismic design parameter.

Settlement. Footings proportioned and constructed as recommended above should experience total settlement of less than 1 inch with differential settlement between any two adjacent footings being no more than one-half inch from the presented foundation loads.

Pavement Sections. The CBR value for the soil types encountered on the site are typically estimated to be 2 to 5; therefore, the following pavement sections are recommended for parking areas and drives. Recommendations for both flexible and rigid pavements are presented in Table 1.

Table 1 – Recommended Pavement Sections for Pavement Life of 20 Years

Loading Type	Concrete	Asphaltic Concrete	Asphaltic Concrete with Aggregate Base
Light Traffic (employee/customer parking, and small delivery truck parking)	5" Portland Cement Concrete 4" Well Graded Granular Base 8" LVC Materials	6" Hot-Mixed Asphalt Concrete 8" LVC Materials	5" Hot-Mixed Asphalt Concrete 6" Well Graded Granular Base Course 8" LVC Materials
Heavy Traffic (delivery drives and loading docks)	8" Portland Cement Concrete 4" Well Graded Granular Base 8" LVC Materials	8" Hot-Mixed Asphalt Concrete 8" LVC Materials	7" Hot-Mixed Asphalt Concrete 6" Well Graded Granular Base Course 8" LVC Materials

Portland cement concrete for pavement, sidewalks, and curbs should have a minimum design strength of 4,000 pounds per square inch (psi).

Pavement in any dumpster area should be the Portland cement concrete section as recommended in the truck access and drives section. Also, preventive maintenance action(s) may be needed for the asphaltic concrete parking and drives in order to maintain the service condition (i.e. crack sealing).

Drainage. The site should be graded so that surface water flows away from the structure and pavement areas and is not allowed to accumulate near or under the slab-on-grade. Where sidewalks or paving do not immediately adjoin the structure, a grade of at least 5 percent for a minimum of 10 feet from the perimeter walls is recommended.

Soil Excavation. Project soils along the project are classified as Type C as indicated by the OSHA Excavation Standard Handbook. The maximum allowable slope for excavation in Type C soils is 1.5:1 (horizontal to vertical). Any fill soils can also generally be classified as Type C. However, because of the potential variability in fill, any questionable materials should be evaluated by qualified personnel. If the above temporary slopes cannot be achieved, flatter slopes or shoring will be required.

To avoid unnecessary collapsing or sliding, no more trench should be excavated ahead of the current pipe placement than is necessary. All trenches should be backfilled before the end of the day.

Landscaping. Consideration should be given to limiting landscaping and irrigation adjacent to the building and pavement areas. Trees and large bushes can draw moisture from subgrade soils resulting in settlement of foundations and pavements.

OBSERVATION OF CONSTRUCTION

The conclusions and recommendations given in this report are based on interpretation of field boring and laboratory data coupled with our experience. Variations may occur from conditions observed within test borings; therefore, it is imperative to involve the geotechnical engineer in the final design and construction process.

Field observation services are viewed as a continuation of the design process. Unless these services are provided, the geotechnical engineer will not be responsible for improper use of recommendations, or failure by others to recognize conditions which may be detrimental to the successful completion of the project.

LIMITATIONS

The analyses, conclusions, and recommendations contained in this report are based on the site conditions and project layout described herein and further assume that the conditions observed in the exploratory borings are representative of the subsurface conditions throughout the site, i.e., the subsurface conditions elsewhere on the site are the same as those disclosed by the borings. If, during construction, subsurface conditions different from those encountered in the exploratory borings are observed or appear to be present beneath excavations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary.

If there is a substantial lapse in time between the submittal of this report and the start of work at the site, or if conditions or the project layout have changed due to natural causes or construction operations at or adjacent to the site, we recommend that this report be reviewed to determine the applicability of conclusions and recommendations considering the changed conditions and time lapse.

We recommend that we be retained to review the project layout and those portions of plans and specifications which pertain to foundations and earthwork to determine if they are consistent with our findings and recommendations. In addition, we are available to observe construction, particularly site grading, earthwork, and foundation construction. We would be available to make other field observations as may be necessary.

This report was prepared for the exclusive use of the owner, architect, and engineer for evaluating the design of the project as it relates to the geotechnical aspects discussed herein. It should be made available to prospective contractors for information on factual data only and not as a warranty of subsurface conditions included in the report. Unanticipated soil conditions may require that additional expense be made to attain a properly constructed project. Therefore, some contingency fund is recommended to accommodate such potential extra costs.

* * * * *

The following plates are attached to and complete this report:

Plate 1 - Boring Location Plan

Plates 2 through 10 - Logs of Borings

Boring Log Reference Legend

* * * * *

We appreciate the opportunity to be of service to you on this project. Please contact us if you have any questions or comments.

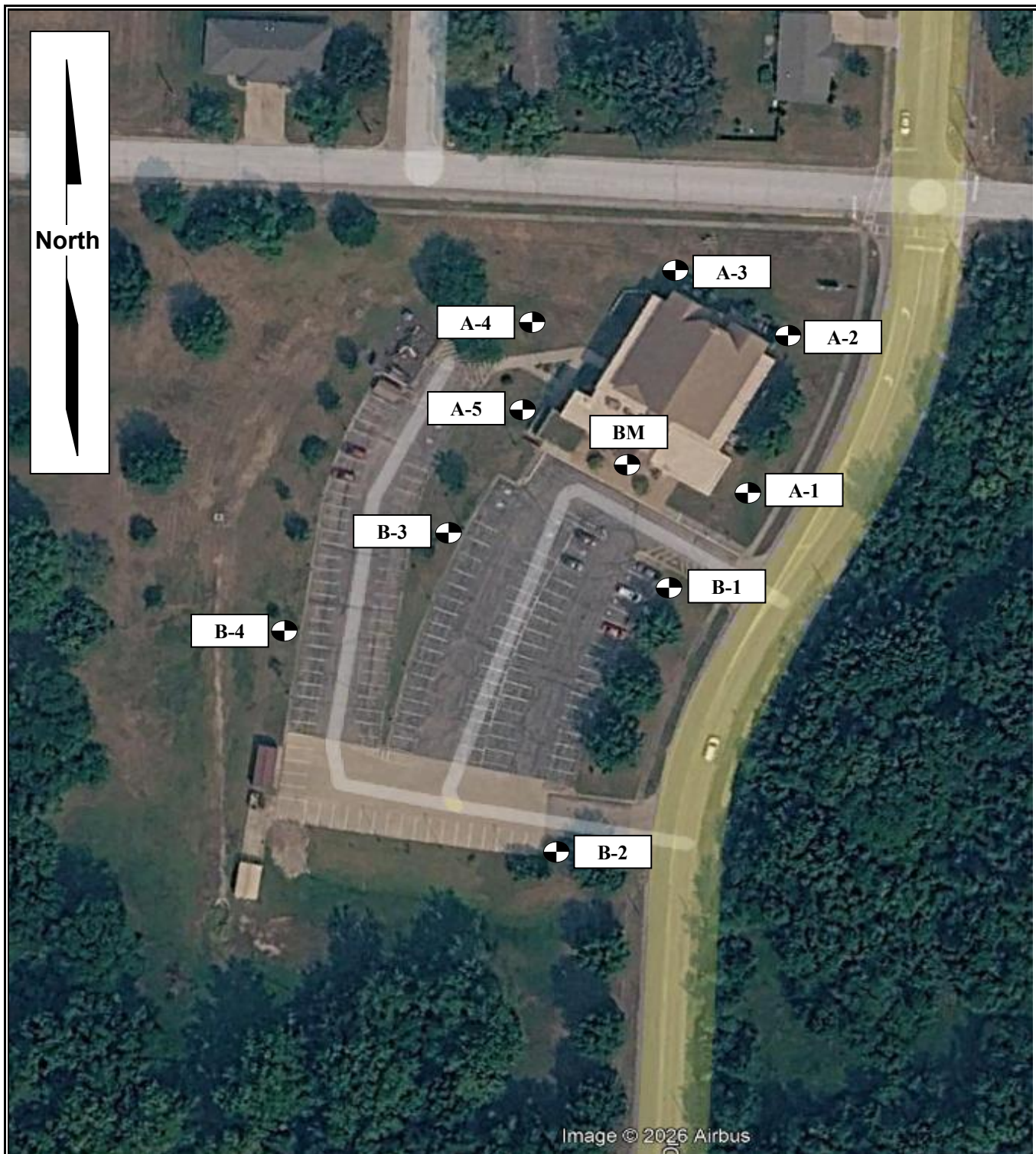
Respectfully submitted,
Kaw Valley Engineering, Inc.

PRELIMINARY

Robert J. Kabus, P.E.
Geotechnical Engineer

PRELIMINARY

Jessica A. Nixon, P.E.
Geotechnical Engineer



Site Plan and Boring Locations

Plate 1

Sacred Heart Catholic Church
300 South Ridgeview Drive
Warrensburg, Missouri

Approved By: RK

Not to Scale

Project No. C26G2801



**KAW
VALLEY**
ENGINEERING

LOG OF BORING A-1

SHEET 1 OF 1



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CLIENT: Diocese of Kansas City-St. Joseph
PROJECT: Real Estate Corporation
NUMBER: Sacred Heart Catholic Church
LOCATION: C26G2801
300 S Ridgeview Dr - Warrensburg,
MO
DATE(S) DRILLED: 9/4/26 - 9/4/26

	FIELD DATA			LABORATORY DATA										MINUS NO. 200 SIEVE (%)	DRILLING METHOD(S): 4" CFA	DRILL RIG: CME 55	DRILL RIG OPERATOR: Steven J. LaRue	LOGGED BY: Jeff Wiggins
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS/SIX INCHES REC: % RQD: %	RECOVERY (IN)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CUBIC FT	COMPRESSIVE STRENGTH, Qu								
						LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		SOILS (POUNDS/SQ.FT)	ROCK (POUNDS/SQ.IN)							
						LL	PL	PI										
DESCRIPTION OF STRATUM																		
	5			24	13.7	54	20	34	115.5	6,649			TOPSOIL (6")	97.7'				
													FAT CLAY: Red brown and gray; firm; moist; with silt, iron stains, and iron deposits					
													92.2'					
	10		T = 16/34/36	13.9									SHALE: Light brown and gray; soft to moderately hard; with silt					
													becoming hard at 8.0'					
													92.2'					
	15		T = 50=6"										SHALE: Gray; weathered; hard	80.4'				
													80.0'					
													BORING TERMINATED AT 18.2'					
	20		T = 50=2"															
	25												REMARKS:					
													N - STANDARD PENETRATION TEST RESISTANCE	Surficial Conditions: Grass				
													P - POCKET PENETROMETER RESISTANCE					

LOG OF BORING A-2

SHEET 1 OF 1



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Telephone: (913)894-5150
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CLIENT: Diocese of Kansas City-St. Joseph
PROJECT: Real Estate Corporation
NUMBER: Sacred Heart Catholic Church
LOCATION: C26G2801
300 S Ridgeview Dr - Warrensburg,
MO
DATE(S) DRILLED: 9/4/26 - 9/4/26

FIELD DATA		LABORATORY DATA										DRILLING METHOD(S): 4" CFA		
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS/SIX INCHES REC: % RQD: %	RECOVERY (IN)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CUBIC FT	COMPRESSIVE STRENGTH, Qu		MINUS NO. 200 SIEVE (%)	DRILL RIG: CME 55	
						LL	PL	PI		SOILS (POUNDS/SQ.FT)	ROCK (POUNDS/SQ.IN)		DRILL RIG OPERATOR: Steven J. LaRue	
													LOGGED BY: Steven J. LaRue	
GROUNDWATER INFORMATION:														
Water level while boring: 11.0'														
Water level after boring: 10.6'														
SURFACE ELEVATION: 98.9'														
DESCRIPTION OF STRATUM														
													Topsoil (12")	97.9'
	5	P = 3.5 T = 3/4/6	23	19.4				110.1	3,449				FAT CLAY: Red brown and gray; firm; moist; with silt, iron stains, and iron deposits	
	10	T = 4/7/11		21.7									SHALE: Light brown and gray; soft; very weathered; with iron staining and trace silt	91.9'
	15	T = 3/0/12											SHALE: Gray; moderately hard; weathered; with silt	84.6'
	18.8	T = 50=3"											becoming hard at 16.0'	80.1'
	20	BORING TERMINATED AT 18.8'												
	25													
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE T - BLOWS PER SIX INCHES REC - ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION													REMARKS: Surficial Conditions: Grass	

SHEET 1 OF 1



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FIELD DATA		LABORATORY DATA										DRILLING METHOD(S): 4" CFA	
												DRILL RIG: CME 55	
												DRILL RIG OPERATOR: Steven J. LaRue	
												LOGGED BY: Jeff Wiggins	
												GROUNDWATER INFORMATION:	
												Water level while boring: 10.5'	
												Water level after boring: 10.7'	
												SURFACE ELEVATION: 98.2'	
												DESCRIPTION OF STRATUM	
												TOPSOIL (6") 97.7'	
												FILL: Lean clay; light brown and gray; firm; moist; with shale and rock fragments	
												92.2'	
												SHALE: Light brown and gray; soft; highly weathered	
												86.2'	
												SHALE: Light gray; hard; weathered; with silt	
												79.4'	
												BORING TERMINATED AT 18.8'	
												REMARKS:	
												Surficial Conditions: Grass	

LOG OF BORING A-4

SHEET 1 OF 1



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FIELD DATA		LABORATORY DATA										DRILLING METHOD(S): 4" CFA DRILL RIG: CME 55 DRILL RIG OPERATOR: Jeff Wiggins LOGGED BY: Jeff Wiggins		
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS/SIX INCHES REC: % RQD: %	RECOVERY (IN)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CUBIC FT	COMPRESSIVE STRENGTH, Qu		MINUS NO. 200 SIEVE (%)		
						LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		SOILS (POUNDS/SQ.FT)	ROCK (POUNDS/SQ.IN)			
						LL	PL	PI						
			P = 1.3	16	26.9				98.3				85.1'	
			T = 0/0/0		29.3								82.6'	
	5												80.6'	
													76.6'	
	10			T = 19/41/50=3"	14.5									
			T = 50=2"											
	15													
			T = 50=4"										66.8'	
	20	BORING TERMINATED AT 18.8'												
	25													
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE T - BLOWS PER SIX INCHES REC - ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION													REMARKS: Surficial Conditions: Grass	

SHEET 1 OF 1



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						LL	PL	PI		SOILS (POUNDS/SQ.FT)	ROCK (POUNDS/SQ.IN)		DRILL RIG OPERATOR: Jeff Wiggins	
													LOGGED BY: Jeff Wiggins	
GROUNDWATER INFORMATION:														
Water level while boring: 12.5'														
Water level after boring: 13.5'														
SURFACE ELEVATION: 88.7'														
DESCRIPTION OF STRATUM														
TOPSOIL (6") 88.2'														
FILL: Lean clay; red brown; stiff; moist; trace silt														
84.7'														
SHALE: Orange and brown with gray; moderately hard; weathered; with coal seams														
77.2'														
SHALE: Gray; moderately hard; weathered														
70.1'														
BORING TERMINATED AT 18.6'														
REMARKS:														
Surficial Conditions: Grass														

LOG OF BORING B-1

SHEET 1 OF 1



Kaw Valley Engineering, Inc.
14700 W 114th Terrace
Lenexa, Kansas 66215
Telephone: (913)894-5150
Fax: (913)894-5977

CLIENT: Diocese of Kansas City-St. Joseph
PROJECT: Real Estate Corporation
NUMBER: Sacred Heart Catholic Church
LOCATION: C26G2801
300 S Ridgeview Dr - Warrensburg,
MO
DATE(S) DRILLED: 9/4/26 - 9/4/26

FIELD DATA		LABORATORY DATA										DRILLING METHOD(S): 4" CFA		
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS/SIX INCHES REC: % RQD: %	RECOVERY (IN)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CUBIC FT	COMPRESSIVE STRENGTH, Qu		MINUS NO. 200 SIEVE (%)	DRILL RIG: CME 55	
						LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		SOILS (POUNDS/SQ.FT)	ROCK (POUNDS/SQ.IN)		DRILL RIG OPERATOR: Steven J. LaRue	
													LOGGED BY: Jeff Wiggins	
GROUNDWATER INFORMATION:														
Water level while boring: Dry														
Water level after boring: Dry														
SURFACE ELEVATION: 98.4'														
DESCRIPTION OF STRATUM														
TOPSOIL (6") 97.9'														
FILL: Fat clay; red brown; firm; moist; with silt and scattered gravel														
94.4'														
FAT CLAY: Red brown with light brown; stiff; moist; with iron deposits														
85.9'														
SHALE: Light brown; moderately hard; weathered; with occasional coal seam														
81.9'														
SHALE: Light brown and gray; moderately hard; weathered; with interbedded siltstone														
78.4'														
BORING TERMINATED AT 20.0'														
REMARKS:														
Surficial Conditions: Grass														

LOG OF BORING B-2

SHEET 1 OF 1



Kaw Valley Engineering, Inc.
14700 W 114th Terrace
Lenexa, Kansas 66215
Telephone: (913)894-5150
Fax: (913)894-5977

CLIENT: Diocese of Kansas City-St. Joseph
PROJECT: Real Estate Corporation
NUMBER: Sacred Heart Catholic Church
LOCATION: C26G2801
300 S Ridgeview Dr - Warrensburg,
MO
DATE(S) DRILLED: 9/3/26 - 9/3/26

FIELD DATA		LABORATORY DATA										DRILLING METHOD(S): 4" CFA			
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS/SIX INCHES REC: % RQD: %	RECOVERY (IN)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CUBIC FT	COMPRESSIVE STRENGTH, Qu		MINUS NO. 200 SIEVE (%)	DRILL RIG: CME 55 DRILL RIG OPERATOR: Steven J. LaRue LOGGED BY: Amelia Harmon		
						LL	PL	PI		SOILS (POUNDS/SQ.FT)	ROCK (POUNDS/SQ.IN)		GROUNDWATER INFORMATION:		
													Water level while boring: Dry Water level after boring: Dry		
SURFACE ELEVATION: 88.7'													DESCRIPTION OF STRATUM		
													TOPSOIL (6")	88.2'	
			P = 4.5+	20	17.5				115.4	8,112			FILL: Lean clay; brown; stiff; moist	86.2'	
	5		T = 2/3/4		16.0	38	13	25					FILL: Lean clay; brown with gray; stiff; moist; with silt and gravel		
														81.2'	
													LEAN CLAY: Dark brown; firm; moist; with silt	80.2'	
	10		T = 1/3/4		22.6								FAT CLAY: Dark brown and gray; stiff; moist; with silt		
														77.7'	
													FAT CLAY: Light brown and light gray; firm; moist; with silt and fine grained sand		
	15		T = 2/2/3		21.1										71.7'
													SHALE: Light gray with light brown; moderately hard to hard; weathered	69.5'	
	20	BORING TERMINATED AT 19.2'													
	25														
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE T - BLOWS PER SIX INCHES REC - ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION													REMARKS: Surficial Conditions: Grass		

LOG OF BORING B-3

SHEET 1 OF 1



Kaw Valley Engineering, Inc.
14700 W 114th Terrace
Lenexa, Kansas 66215
Telephone: (913)894-5150
Fax: (913)894-5977

CLIENT: Diocese of Kansas City-St. Joseph
PROJECT: Real Estate Corporation
NUMBER: Sacred Heart Catholic Church
LOCATION: C26G2801
300 S Ridgeview Dr - Warrensburg,
MO
DATE(S) DRILLED: 9/4/26 - 9/4/26

FIELD DATA		LABORATORY DATA										DRILLING METHOD(S): 4" CFA			
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS/SIX INCHES REC: % RQD: %	RECOVERY (IN)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CUBIC FT	COMPRESSIVE STRENGTH, Qu		MINUS NO. 200 SIEVE (%)	DRILL RIG: CME 55		
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI		SOILS (POUNDS/SQ.FT)	ROCK (POUNDS/SQ.IN)		DRILL RIG OPERATOR: Steven J. LaRue		
													LOGGED BY: Jeff Wiggins		
GROUNDWATER INFORMATION:														SURFACE ELEVATION: 94.5'	
Water level while boring: 18.5'														DESCRIPTION OF STRATUM	
Water level after boring: 18.5'															
TOPSOIL (6")														94.0'	
FILL: Fat clay; red brown and gray; stiff; moist															
becoming soft at 3.0'															
FILL: Lean clay; dark brown; firm; moist; with organics														84.5'	
FAT CLAY: Dark gray with light brown; soft; very moist; with silt														82.5'	
FAT CLAY: Red brown and gray; firm; moist; trace silt														77.0'	
BORING TERMINATED AT 20.0'														74.5'	
REMARKS:															
Surficial Conditions: Grass															

LOG OF BORING B-4

SHEET 1 OF 1



Kaw Valley Engineering, Inc.
14700 W 114th Terrace
Lenexa, Kansas 66215
Telephone: (913)894-5150
Fax: (913)894-5977

CLIENT: Diocese of Kansas City-St. Joseph
PROJECT: Real Estate Corporation
NUMBER: Sacred Heart Catholic Church
LOCATION: C26G2801
300 S Ridgeview Dr - Warrensburg,
MO
DATE(S) DRILLED: 9/3/26 - 9/3/26

	FIELD DATA			LABORATORY DATA										MINUS NO. 200 SIEVE (%)	DRILLING METHOD(S): 4" CFA	DRILL RIG: CME 55	DRILL RIG OPERATOR: Steven J. LaRue	LOGGED BY: Amelia Harmon
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS/SIX INCHES REC: % RQD: %	RECOVERY (IN)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CUBIC FT	COMPRESSIVE STRENGTH, Qu								
						LL	PL	PI		SOILS (POUNDS/SQ.FT)	ROCK (POUNDS/SQ.IN)							
GROUNDWATER INFORMATION:														SURFACE ELEVATION: 87.5'				
DESCRIPTION OF STRATUM																		
														TOPSOIL (6")	87.0'			
														LEAN CLAY: Light brown with light gray; stiff; moist; trace silt and sand	85.5'			
														SHALE: Brown with gray; moderately hard to hard; weathered				
	5		P = 2.4	24	18.3	31	11	20	110.5	2,184								
														</				

BORING LOG REFERENCE LEGEND

DESCRIPTIVE SOIL CLASSIFICATION

Soil description is based on the Unified Soil Classification System as outlined in ASTM Designation D-2487. The Unified Soil Classification group symbol for soil descriptions shown on the boring logs corresponds with the group names listed below. The description includes soil constituents, consistency, relative density, color and any other appropriate descriptive terms. Geologic description of bedrock, when encountered, is also shown in the description column. Refer to the appropriate notes for bedrock classification.

Group Symbol	Group Name	Group Symbol	Group Name	Group Symbol	Group Name	Group Symbol	Group Name
GW	Well graded gravel	SW	Well graded sand	CL	Lean clay	CH	Fat clay
GP	Poorly graded gravel	SP	Poorly graded sand	ML	Silt	MH	Elastic silt
GM	Silty gravel	SM	Silty sand	OL	Organic clay Organic silt	OH	Organic clay Organic silt
GC	Clayey gravel	SC	Clayey sand			PT	Peat

CONSISTENCY OF FINE-GRAINED SOILS

Unconfined Compressive Strength, Q_u , psf

< 500	Very Soft
500 – 1,000	Soft
1,001 – 2,000	Firm
2,001 – 4,000	Stiff
4,001 – 8,000	Very Stiff
8,001 – 16,000	Hard
> 16,000	Very Hard

RELATIVE PROPORTIONS

Descriptive Term(s) (Components also Percent in Sample)	Sand & Gravel Percent of Dry Wt.	Fines Percent of Dry Wt.
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Trace	< 15	< 5
Some	15 – 29	5 - 12
Modifier	> 30	> 12

RELATIVE DENSITY OF COARSE-GRAINED SOILS

N - (blows/ft)	Relative Density
0 – 3	Very Loose
4 – 9	Loose
10 – 29	Medium Dense
30 – 49	Dense
50+	Very Dense

GRAIN SIZE TERMINOLOGY

Major Component	Size Range
Cobbles	12 in to 3 in
Gravel	3 in to #4 sieve
Sand	#4 to #200 sieve
Silt or Clay	Passing #200 sieve

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. In pervious soil the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels is not possible with only short-term observation.

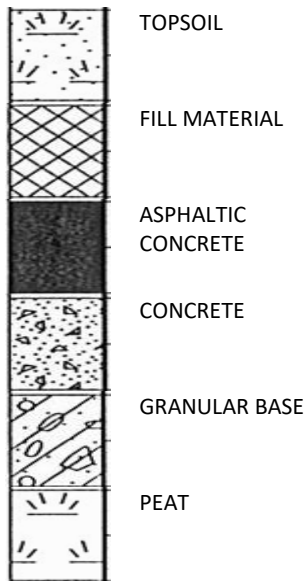
DEFINITIONS OF ABBREVIATIONS

CR –	Core recovery, length of core recovered in each run compared to the length drilled expressed as percent
LL –	Liquid limit of specimen
N –	Number of blows to penetrate last 12 inches with 140-pound hammer in standard penetration test
	Blow count reported for each 6-inch interval on logs
PL –	Plastic limit of specimen
RQD –	Rock quality designation, aggregate length of core pieces greater than 4 inches long, expressed as percent of length drilled
TW –	Thin walled tube
SS –	Standard penetration test
NQ2 –	2 inches diameter core
CFA –	Continuous flight augers
HSA –	Hollow stem augers
EOB –	End of boring

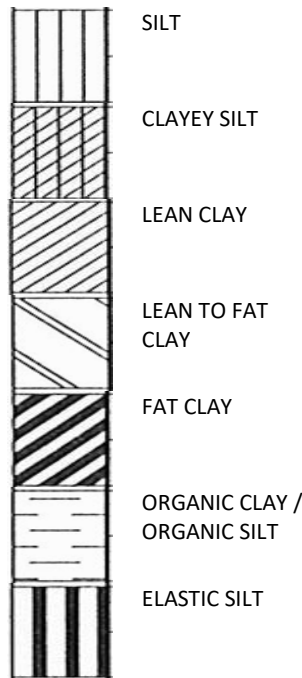


BORING LOG SYMBOLS

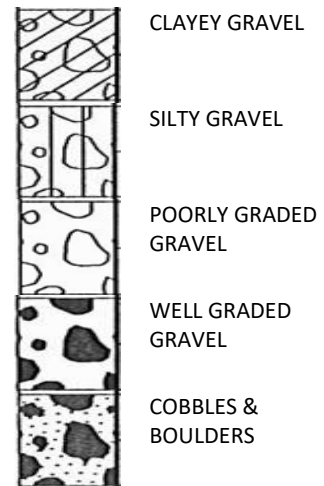
SURFACE MATERIALS



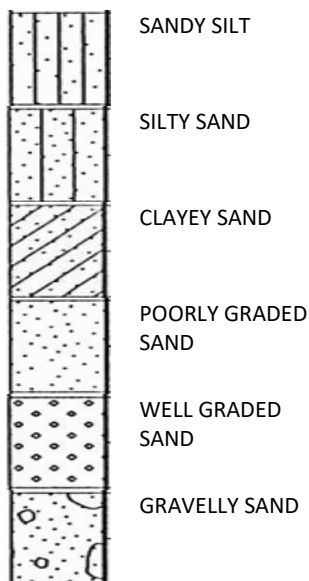
COHESIVE SOILS



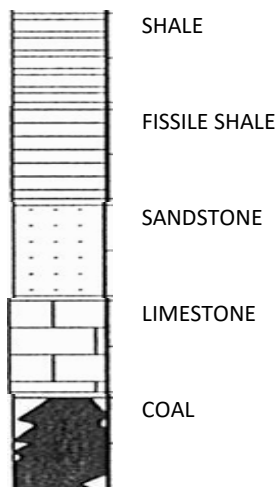
LARGE GRANULAR SOILS



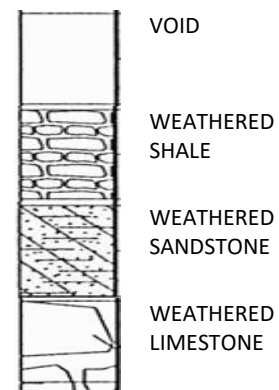
GRANULAR SOILS



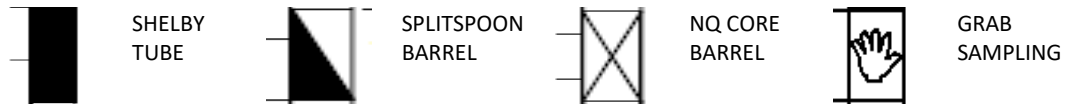
BEDROCK UNITS



WEATHERED BEDROCK



SAMPLING METHOD



WATER READING SYMBOLS

