

ADDENDUM No. 3: December 3, 2018

PROJECT: Saint John the Baptist
Westbank Public Safety Complex
PROJECT NO.: STBA 21238.00
FROM: SIZELER THOMPSON BROWN ARCHITECTS
300 Lafayette Street, Suite 200
New Orleans, Louisiana 70130
(504) 523-6472
TO: All on Record holding Bid Documents

This Addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated October 15, 2018. The contents of this Addendum shall be included in the Contract Documents when the Agreement is executed. Changes made by this Addendum take precedence of the Documents of earlier date.

Bidders are advised to call attention of all sub-bidders and suppliers to changes, which may affect their work.

Acknowledge receipt of this Addendum in the space provided on the Bid Form.

PRE-BID CONFERENCE:

1. A Mandatory Pre-Bid Conference was held on Tuesday, November 27, 2018, at the the Joel S. McTopy Council Chambers located at 1801 West Airline Highways, LaPlace, LA. The attached Sign-in sheet list the attendees of this meeting. **ONLY** attending contractors shall be eligible to submit bids for this project.

CLARIFICATIONS:

1. At the pre-bid conference the question was ask "Will flood insurance be required? Both purchasing and the Architect's Project Manager responded "Yes". That was incorrect, **Flood Insurance IS NOT** required for this project.

CONTRACTOR QUESTIONS:

The following questions were presented to Sizeler Thompson Brown Architects. The answers are in *bold and italics* print.

1. I was checking to see if there is a budget for the Westbank Public Safety Complex?

RESPONSE: The budget for the Westbank Public Safety Complex is \$1,800,000.00.

2. Is this project sales tax exempt? If the project is sales tax exempt can the government provide a sales tax exemption certificate?

RESPONSE: This project is tax exempt and the proper paperwork will be provided to the successful bidder prior to construction.

3. Are there any special software systems that the owner will require the contractor to use or purchase?

RESPONSE: Contractors shall comply with Section 01 3300. Including paragraph 1.5.C.

4. Does the Government have a fire alarm servicer that the contractor will need to hire?

RESPONSE: No, Contractors shall bid this work with the rest of the project.

5. Does the Government currently have a 3rd party testing service for concrete or steel or is the contractor free to locate and hire applicable testing firms?

RESPONSE: The owner will provide a qualified testing laboratory for all owner provided testing.

6. Who is responsible for the utility locations if utilities are not readily available near work area or shown on plans?

RESPONSE: One Call will provide the utility locations within the right-of-way. If any existing services shown on the survey are determined not to be present within the vicinity(s) of the locations indicated, then that would

constitute an unforeseen condition.

7. Is the owner carrying the cost of connecting to the main utilities (sewer, water, gas) or will those be carried by the contractor?

RESPONSE: The Contractor shall include the cost of connecting to all utilities identified on the contract documents.

8. Will the contractor have weekly meetings with the owner and architect throughout the project?

RESPONSE: Reference updated specification section 01 3119 included in this Addenda.

9. Since work will be happening near power lines, will the contractor be required to pay for or coordinate with the power company, the moving of the power lines either temporarily or permanently?

RESPONSE: The Contractor shall be responsible for coordination with the public utilities and all associated cost.

SUBSTITUTION REQUEST

10.12 4816 - Entrance Floor Grilles

Construction Specialties submitted for a request for substitution for their Pedigrid - Model G1CVLVB.

This Substitution Request is hereby approved.

MODIFICATIONS TO THE SPECIFICATIONS

1. 00 0110 Table of Contents

Add the following section to the Table of Contents:

08 9100 - Louvers

10 7310 - Extruded Aluminum Canopies
26 3213 - Engine Generators - Natural Gas

2. 01 3119 - Project Meetings

Delete paragraph 1.6 A. in its entirety and replace with:

- A. **Requirements:** The Architect shall schedule and conduct progress meetings at regular monthly intervals, unless otherwise scheduled during construction.

Delete paragraph 1.6 D. in its entirety and replace with:

- D. **Reporting:** After each progress meeting date, the Architect shall send copies of meeting minutes to the Owner, the Contractor and to other parties present and to other parties who should have been present.
1. **Action:** Responsibility for action and date for completing action shall be indicated for each item requiring resolution.

3. 08 9100 - Louvers

Added this section in its entirety.

4. 09 6500 Resilient Flooring

Delete Paragraph 2.2 in its entirety and insert the following paragraph:

2.2 **TILE FLOORING (ALTERNATE #1)**

- A. Material listed below are to be used to establish **the Add Alternate #1 ONLY.**
- B. Luxury Vinyl Tile: Surface pattern type, and:
1. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
 2. Size: As noted below.
 3. VOC Content Limits: As specified in Section 01 6116.
 4. Thickness: 0.125 inch (3.2 mm).
 5. Pattern: Solid color.
 6. Manufacturers:

- a. Patcraft, Dalton Georgia: www.patcraft.com. **BASIS OF DESIGN.**
 - b. Mohawk Group; www.mohawkgroup.com.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
7. Materials:
- a. **BASIS OF DESIGN:**
 - 1) LVT 1: Patcraft,
Style I426 CMYK,
Color Smoke
Size: 12"x24"
 - 2) LVT 1: Patcraft,
Style I313V CHARTED,
Color Asterisks
Collection: Typography
Size: 23 5/8"x23 5/8"
 - 3) LVT 3: Patcraft,
Style I426 CMYK,
Color Solstice
Size: 12"x24"

5. **10 7310 - Extruded Aluminum Canopies**

Added this section in its entirety.

6. **12 4816 - Entrance Floor Grilles**

Paragraph 2.1 A. add the following:

- 3. Ronick Matting Systems (**Approved Substitution**)
 - a. Series: Pedigrid G1
 - b. Model No. Level Base, VA abrasive grit tape.

7. **Appendix A - Geotechnical**

Added this section in its entirety. The Appendix was listed in the Index but was not included in the Project Manual.

MODIFICATIONS TO THE DRAWINGS

None

This ADDENDUM consists of:

SIX (6) TYPE WRITTEN ADDENDUM PAGES, ZERO (0) FULL SIZE DRAWINGS, SEVENTY EIGHT (78) SPECIFICATION PAGES.

ATTACHMENTS

- SPECIFICATIONS :
 - 00 0110 TABLE OF CONTENTS (6 PAGES)
 - 01 3119 PROJECT MEETINGS (4 PAGES)
 - 08 9100 LOUVERS (4 PAGES)
 - 09 6500 RESILIENT FLOORING (7 PAGES)
 - 10 7310 EXTRUDED ALUMINUM CANOPIES (5 PAGES)
 - 12 4816 ENTRANCE FLOOR GRILLES (5 PAGES)
 - 26 3213 ENGINE GENERATORS - NATURAL GAS (18 PAGES)
 - APPENDIX A (29 PAGES)

- DRAWINGS : NONE

for a total of EIGHTY FOUR (85) DOCUMENT SHEETS.

DOCUMENT 00 0110

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END OF DOCUMENT

SECTION 01 3119

PROJECT MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.

1.2 SUMMARY

- A. **This Section includes:** Administrative and procedural requirements for project meetings, including, but not limited to:
 - 1. Procedures.
 - 2. Pre-construction conference.
 - 3. Pre-installation conferences.
 - 4. Progress meetings.
 - 5. Called meetings.
- B. **Related Sections include:**
 - 1. Section 01 3100 - Project Management and Coordination: Coordinating Project meetings with other construction activities.
 - 2. Section 01 3200 - Construction Progress Documentation: Contractor's Construction Schedule.

1.3 PROCEDURES

- A. **General:** Requirements of this Section amplify and do not modify provisions of the General and Supplementary Conditions. This Section specifies administrative and procedural requirements for Project meetings.
- B. **Contractor's Responsibility:** Project meetings are administrative activities to facilitate the Contractor's direction of the Work. As such, it is the responsibility of the Contractor to implement understandings reached during meetings, unless otherwise stated.
- C. **Location:** Unless otherwise agreed in advance, hold meetings at the Project site.
- D. **Pre-Construction Conference:** The Architect will keep minutes of meeting and promptly distribute copies to the Owner, and the Contractor. The Contractor shall distribute minutes to Subcontractors, other attendees and interested parties.
- E. **All Other Project/Construction Meetings:** The Contractor will keep minutes of meetings and promptly distribute copies to the Owner, the Architect and other attendees and interested parties.
- F. **Attendance:** Contractor shall require attendance at meetings of Owner, General Contractor and Architect. The Architect will attend in the capacity of the Owner's representative and interpreter of Contract requirements.
- G. **Additional Meetings:** The Contractor shall arrange for meetings, in addition to those specified in this Section, as necessary for the performance of the Work according to the Contractor's schedule, or as instructed by the Architect at the request of the Owner.

1.4 PRE-CONSTRUCTION CONFERENCE

- A. **General:** After notification that the Contract has been executed, the Architect shall arrange with the Owner, and Contractor, and conduct a Pre-Construction Conference to be held at the Project site. The Contractor shall be responsible to see that his principal subcontractors are in attendance and shall furnish to the Architect, Owner, and the following:
1. Schedule of Values.
 2. List of subcontractors and material suppliers.
 3. Contractor's Construction Schedule.
 4. Documentation, qualification data and certificates as required by Owner and/or Architect.
- B. **Attendees:** The Owner, Architect and Architect's consultants, the General Contractor and its superintendent, and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the Work.
- C. **Minimum Agenda:** Distribute data on, and discuss:
1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, material suppliers, and Architect.
 2. Channels and procedures for communications.
 3. Construction schedule, including sequence of critical Work.
 4. Contract Documents, including distribution of required copies of original Documents and Revisions; Owner's acceptance/rejection of Alternates.
 5. Processing of Shop Drawings and other data submitted to Architect for review.
 6. Processing for field decisions and Change Orders.
 7. Rules and regulations governing performance of Work.
 8. Security.
 9. Quality control.
 10. Housekeeping.
 11. Equipment deliveries and priorities.
 12. Parking availability.
 13. Office, work, and storage areas.
 14. Use of premises.
 15. Preparation of Record Documents.
 16. Working hours.
 17. Policy for Owner initiated delay days.
 18. Mechanical systems - testing, adjusting, and balancing.

1.5 PRE-INSTALLATION CONFERENCES

- A. **Requirements:** The Contractor shall arrange and conduct a pre-installation conference at the site before each construction activity that requires coordination with other construction. The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Owner and Architect of scheduled meeting dates.

- B. **Purpose:** Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:
1. Contract Documents.
 2. Options.
 3. Related Change Orders.
 4. Purchases.
 5. Deliveries.
 6. Shop Drawings, Product Data and quality control samples.
 7. Possible conflicts.
 8. Compatibility problems.
 9. Time schedules.
 10. Weather limitations.
 11. Manufacturer's recommendations.
 12. Compatibility of materials.
 13. Acceptability of substrates.
 14. Temporary facilities.
 15. Space and access limitations.
 16. Governing regulations.
 17. Safety.
 18. Inspection and testing requirements.
 19. Required performance results.
 20. Recording requirements.
 21. Protection.
- C. **Reporting:** Record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Architect.
- D. **Problems:** Do not proceed with affected work if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

1.6 PROGRESS MEETINGS

- ~~A. **Requirements:** The Contractor shall schedule and conduct progress meetings at regular monthly intervals, unless otherwise scheduled during construction.~~
- A. **Requirements:** The Architect shall schedule and conduct progress meetings at regular monthly intervals, unless otherwise scheduled during construction.
- B. **Attendees:** The Owner, Architect, and Contractor shall meet and review the current status and future expected progress of the project.
- C. **Agenda:** Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.
1. Contractor's Construction Schedule: Review progress since the last meeting. Determine status of each activity in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how work behind schedule will be expedited; secure commitments from parties involved to do so. Discuss need for schedule revisions to ensure that current and subsequent activities will be completed within the Contract Time.

2. Review the present and future needs of the contractor, including such items as:
 - a. Coordination requirements
 - b. Submittals
 - c. Open RFI's
 - d. Time
 - e. Sequences
 - f. Deliveries
 - g. Off-site fabrication problems
 - h. Access
 - i. Site utilization
 - j. Temporary facilities and services
 - k. Hours of Work
 - l. Safety
 - m. Housekeeping
 - n. Quality and Work standards
 - o. Change Orders
 - p. Documentation of information for payment requests
- ~~D. Reporting: After each progress meeting date, the Contractor shall send copies of meeting minutes to the Owner, the Architect and to other parties present and to other parties who should have been present.~~
 - ~~1. Action: Responsibility for action and date for completing action shall be indicated for each item requiring resolution.~~
- D. Reporting: After each progress meeting date, the Architect shall send copies of meeting minutes to the Owner, the Contractor and to other parties present and to other parties who should have been present.
 1. Action: Responsibility for action and date for completing action shall be indicated for each item requiring resolution.
- E. Schedule Updating: The Contractor shall revise the construction schedule prior to each progress meeting where revisions to the Schedule have been made or recognized. The Contractor shall issue the revised Schedule as specified in Section 01 3200.

1.7 CALLED MEETINGS

- A. Called meetings may be scheduled in addition to regularly scheduled Progress Meetings. All applicable personnel will be required to attend.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 08 9100 LOUVERS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Louvers, frames, and accessories.

1.3 RELATED REQUIREMENTS

- A. Section 07 2500 - Weather Barriers: Sealing frames to weather barrier installed on adjacent construction.
- B. Section 07 6200 - Sheet Metal Flashing and Trim.
- C. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.
- D. Section 23 0913 - Instrumentation and Control Devices for HVAC: Actuators for operable louvers.
- E. Section 23 3300 - Air Duct Accessories: Fire/smoke dampers associated with exterior wall louvers.

1.4 REFERENCE STANDARDS

- A. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; 2012.
- B. AMCA 511 - Certified Ratings Program for Air Control Devices; 2010.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- D. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

1.5 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.
- C. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens, blankout areas required, and frames.
- D. Samples: Submit two samples 2 by 2 inches (50 by 50 mm) in size illustrating finish and color of exterior and interior surfaces.
- E. Test Reports: Independent agency reports showing compliance with specified performance criteria.

1.6 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.1 LOUVERS

- A. Manufacturers:
 - 1. Basis of Design:
 - a Greenheck Fan Corporation: Model EVH-501D
 - 2. Alternative Manufacturers:
 - a The Airolite Company
 - b Construction Specialties
 - c Ruskin
- B. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified in accordance with AMCA 511.
 - 1. Wind Load Resistance: Miami-Dade Oqualified, Wind-Driven Rain Louver.
 - 2. Intake Louvers: Design to allow maximum of 0.01 oz/sq ft (3.1 g/sq m) water penetration at calculated intake design velocity based on design air flow and actual free area, when tested in accordance with AMCA 500-L.
 - 3. Drainable Blades: Continuous rain stop at front or rear of blade aligned with vertical gutter recessed into both jambs of frame.
 - 4. Screens: Provide insect screens at intake louvers and bird screens at exhaust louvers.
- C. Operable Louvers, Type where indicated: Operable horizontal blades, extruded aluminum construction.
 - 1. Manufacturers:
 - a Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Free Area: 50 percent, minimum.
 - 3. Movable Blades: Straight, pivoted at, with vinyl, rubber, or polyethylene blade edge and jamb seals; rattle-free linkage.

4. Frame: 4 inches (100 mm) deep, channel profile; corner joints mitered and, with continuous recessed caulking channel each side.
5. Aluminum Thickness: Frame 12 gage, 0.0808 inch (2.05 mm) minimum; blades 12 gage, 0.0808 inch (2.05 mm) minimum.

2.3 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T-5 temper.

2.4 FINISHES

- A. Superior Performing Organic Coatings: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
 1. Polyvinylidene fluoride (PVDF) multi-coat thermoplastic fluoropolymer coating system, including minimum 70 percent PVDF color topcoat and minimum total dry film thickness of 0.9 mil (0.023 mm); color and gloss as indicated on drawings.
 2. Color: As selected by Architect from Manufacturers **Full Range of Colors**.

2.5 ACCESSORIES

- A. Blank-Off Panels: Same material as louver, painted black on exterior side; provide where duct connected to louver is smaller than louver frame, sealing off louver area outside duct.
- B. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.
- C. Fasteners and Anchors: Galvanized steel.
- D. Flashings: Of same material as louver frame, formed to required shape, single length in one piece per location.
- E. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that prepared openings and flashings are ready to receive this work and opening dimensions are as indicated on shop drawings.

3.2 INSTALLATION

- A. Install louver assembly in accordance with manufacturer's instructions.

- B. Install louvers level and plumb.
- C. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- D. Secure louver frames in openings with concealed fasteners.

3.3 ADJUSTING

- A. Adjust operable louvers for freedom of movement of control mechanism. Lubricate operating joints.

3.4 CLEANING

- A. Clean surfaces and components.

END OF SECTION

SECTION 09 6500 RESILIENT FLOORING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Resilient sheet flooring.
- B. Resilient tile flooring.
- C. Resilient base.
- D. Installation accessories.

1.3 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.
- C. Section 09 0561 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.

1.4 REFERENCE STANDARDS

- A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
- B. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2004 (Reapproved 2010).
- C. ASTM F1861 - Standard Specification for Resilient Wall Base; 2008 (Reapproved 2012).

1.5 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

- C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
- D. Verification Samples: Submit two samples, 12 x 12 inch (304.8 x 304.8 mm) in size illustrating color and pattern for each resilient flooring product specified.
- E. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.
- F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Flooring Material: 1 box of tile for every 50 boxes of tile or fraction thereof, of each type, color and pattern of floor tile installed.
 - 3. Extra Wall Base: 100 linear feet (31 linear meters) of each type and color.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect roll materials from damage by storing on end.
- B. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

1.7 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

1.8 WARRANTY

- A. Manufacturer's Warranty: Manufacturer to provide limited warranty for transition strips. The warranty period shall be a minimum of 5 years after substantial completion.
- B. Manufacturer's Warranty: Manufacturer to provide warranty for resilient tile flooring. The warranty period shall be a minimum of 6 years after substantial completion.
- C. Special Project Warranty: Submit flooring Installer's Warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, for the following warranty period.
 - 1. Warranty Period: 2 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 SHEET FLOORING

2.2 TILE FLOORING (BASE BID)

- A. Vinyl Composition Tile: Homogeneous, with color extending throughout thickness, and:
 - 1. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
 - 2. Size: 12 x 12 inch (305 x 305 mm).
 - 3. VOC Content Limits: As specified in Section 01 6116.
 - 4. Thickness: 0.125 inch (3.2 mm).
 - 5. Pattern: Solid color.
 - 6. Manufacturers:
 - a. Armstrong World Industries, Inc; Product Excelon Chromaspin: www.armstrong.com. **BASIS OF DESIGN**.
 - b. Mannington Mills, Inc; Product Touchstone: www.mannington.com.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
 - 7. Material:
 - a. **BASIS OF DESIGN**: As indicated on the drawings. No alterations or substitutions. No exceptions without approval of the Architect.
 - 1) VCT 1: As indicated on the drawings.
 - 2) VCT 2: As indicated on the drawings.
 - 3) VCT 3: As indicated on the drawings.
 - b. Alternate to Basis of Design: These selections are to be used together as indicated on the drawings. No alterations or substitutions. No exceptions without the approval of the Architect.
 - 1) VCT 1-ALT: Carbonite 54802.
 - 2) VCT 2-ALT: Paynes Gray 54801.
 - 3) VCT 3- ALT: Brilliant Orange 54820.
 - 4) VCT 4- ALT: Carminelle 54822.

2.2 TILE FLOORING (ALTERNATE #1)

- A. Material listed below are to be used to establish the Add Alternate #1 ONLY.
- B. Luxury Vinyl Tile: Surface pattern type, and:
 - 1. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
 - 2. Size: As noted below.
 - 3. VOC Content Limits: As specified in Section 01 6116.
 - 4. Thickness: 0.125 inch (3.2 mm).
 - 5. Pattern: Solid color.
 - 6. Manufacturers:
 - a. Patcraft, Dalton Georgia: www.patcraft.com. BASIS OF DESIGN.
 - b. Mohawk Group; www.mohawkgroup.com.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
 - 7. Materials:
 - a. BASIS OF DESIGN:
 - 1) LVT 1: Patcraft,
Style I426 CMYK,
Color Smoke
Size: 12"x24"
 - 2) LVT 1: Patcraft,
Style I313V CHARTED,
Color Asterisks
Collection: Typography
Size: 23 5/8"x23 5/8"
 - 3) LVT 3: Patcraft,
Style I426 CMYK,
Color Solstice
Size: 12"x24"

2.3 RESILIENT BASE

- A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove, and as follows:
 - 1. Height: 4 inch (100 mm).
 - 2. Thickness: 0.125 inch (3.2 mm) thick.
 - 3. Finish: Matte.
 - 4. Length: Roll. Continuous Coil.
 - 5. Color: Solid color.
 - 6. Manufacturers:
 - a. Johnsonite, a Tarkett Company: www.johnsonite.com. BASIS OF DESIGN.
 - b. Roppe Corp: www.roppe.com.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
 - 7. Materials:

- a. **BASIS OF DESIGN:** These selections are to be used together as indicated on the drawings. No alterations or substitutions. No exceptions without approval of the Architect.
 - 1) RB 1: 63 Burnt Umber.
 - 2) RB 2: 48 Grey.
- b. **Alternate to Basis of Design:** These selections are to be used together as indicated on the drawings. No alterations or substitutions. No exceptions without the approval of the Architect.
 - 1) RB 1- ALT: 193 Black Brown.
 - 2) RB 2- ALT: 148 Steel Grey.

2.4 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.
- C. Moldings, Transition and Edge Strips: Same material as flooring.
- D. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
- C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
 1. Test in accordance with Section 09 0561.
 2. Obtain instructions from the flooring manufacture if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
- D. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

- C. Prohibit traffic until filler is cured.
- D. Clean substrate.
- E. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.3 INSTALLATION

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install in accordance with manufacturer's instructions.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Fit joints tightly.
- E. Set flooring in place, press with heavy roller to attain full adhesion.
- F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
 - 1. Resilient Strips: Attach to substrate using adhesive.
- H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.4 TILE FLOORING

- A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless manufacturer's instructions say otherwise.
- B. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

3.5 RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches (45 mm) between joints.
- B. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

3.6 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.

- B. Clean in accordance with manufacturer's instructions.

3.7 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

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SECTION 10 7310

EXTRUDED ALUMINUM CANOPIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Design, Engineering and installation of extruded aluminum cantilever canopies. Canopies shall connect to stub beams at exterior walls and shall be self supporting without hangers, as detailed in the drawings.
- B. Related Work:
 - 1. Division 01 "Product Substitution Procedures".
 - 2. Division 07 "Sealants".
 - 3. Division 26 "Exterior Lighting".
 - a. Coordinate installation of canopy with installation of recessed lighting in soffit of canopies by the electrical contractor.

1.3 REFERENCES

- A. The Aluminum Association- Aluminum Design Manual 2010
- B. American Welding Society- AWS D1.2/D1.2M: 2008

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Canopy shall be designed to comply with the requirements of all governing building codes, including all connections of canopy framing members and the connections of canopy framing members to supporting members, cold-formed steel framing and structural elements. Erect canopy framing to withstand the wind design parameters indicated on the drawings and to comply with IBC 2012 requirements.
 - 1. Install framing systems to provide for movement of framing members without damaging or overstressing connections or undue strain on fasteners and anchors or other detrimental effects when subjected to a maximum ambient temperature change (range) of 120 degrees F.
 - 2. Coordinate all connection designs with all exterior wall and structural building systems.
- B. Field Measurements: Confirm dimensions prior to preparation of shop drawings.

1. Submit shop drawings showing structural component locations/positions, material dimensions and detail of construction and assembly.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's descriptive literature for specified systems, including all components.
- B. Shop drawings of the complete canopy layout, including sections and details specific to project and bearing the seal of a registered structural engineer.
 1. Indicate layout heights, component connection details, details of interface with adjacent construction, connection details to building exterior wall structure and framing.
 2. Field Measurement: Confirm dimensions prior to preparation of shop drawings.
 3. Submit shop drawings showing structural component locations/positions, material dimensions and details of construction and assembly.
 4. Indicate locations of canopy lights in shop drawings.
- C. Samples of canopy finishes.
 1. Provide 2 samples, a minimum of 6-inches square, representing actual color and finish of products to be installed.
- D. Certificates: Submit Contractor's certification that manufacturer of products of this Section meet specified qualifications.
 1. Manufacturer's certification that installer of this section is approved.
- E. Installation Instructions: Submit manufacturer's printed installation instructions for specified systems, including each component.
- F. Structural Design Calculations: Submit structural design calculations, including footing designs, for aluminum walkways and canopies. Calculations shall bear the seal and signature of a registered professional Structural Engineer licensed to practice in the State of Louisiana.

1.6 QUALITY ASSURANCE

- A. Canopy shall be designed to comply with local building codes.
- B. Canopy manufacturer shall have a minimum of 10 years' experience in designing and installing the specified system.
- C. The installation of the canopy shall be performed by the manufacturer to assure single source responsibility.

1.7 WARRANTY

- A. Manufacturer's Warranty: Provide a ten-year manufacturer's warranty including coverage of materials and workmanship.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product by one of the following:
 - 1. AVAdek Walkway Cover Systems and Canopies. **(Basis of Design)**
 - 2. Mapes Architectural Canopies.

2.2 MATERIALS

- A. All components shall be 6063; 6061 or 6005 alloy extruded aluminum.
- B. Components shall be sized to comply with live load and wind load requirements of the project and shall not be less than the dimensions shown on the plan.
 - 1. Wind load requirements shall be in accordance with IBC. 2009.
- C. The thickness of the aluminum deck panels shall be at least .080" thick.
- D. All columns shall have radius corners.
- E. Beams are open at top to drain canopy system internally into exterior scuppers.
- F. Flashing shall be .040" thick.
- G. All bolts and fasteners shall be stainless steel or finished to match adjacent components and sized by canopy engineer.

2.3 FINISHES

- A. The finish and color selection of each component shall be chosen from the manufacturer's standard color selections and shall include:
 - 1. Polyester Baked Enamel
 - 2. Fluoropolymer
 - 3. Anodized- Clear, Bronze & Champagne

PART 3 - EXECUTION

3.1 FABRICATION

- A. Fabrication: Material shall be fabricated from approved shop drawings. The General Contractor shall field verify all dimensions, elevations and conditions before releasing for fabrication.
- B. All welding shall be in compliance with AWS 1.2. The certification of each welder shall be available to verify compliance.
- C. Canopy shall be designed to drain through beams to scuppers with water tight connections.

3.2 EXAMINATION

- A. Confirm that surrounding area is ready for the canopy installation.
- B. Installer shall confirm dimensions and elevations to approved shop drawings.
- C. Coordinate with responsible installers to correct unsatisfactory conditions or installation.
- D. Erection shall be scheduled, coordinated and performed after all concrete, masonry, metal panel, curtain wall, and roofing in the area is completed.
- E. Commencement of work by the contractor and the installer will considered as acceptance of existing conditions and substrates.

3.3 INSTALLATION

- A. Install the canopy in strict accordance with the manufacturer's recommendations.
- B. Install the canopy in strict accordance with the manufacturer's recommendations and approved shop drawings.
- C. Ensure that adjacent surfaces, structures, and finishes are protected from damage by construction activities of this Section.
- D. Tolerances: Set components plumb, straight, and true to line, adequately braced to maintain position until all connections are made.
- E. Coordinate with Electrical Contractor to allow access for electrical and installation of canopy lighting.
- F. Install columns and beams straight and true.
- G. Electrolysis Prevention: Keep aluminum surfaces from direct contact with ferrous metals or other incompatible materials by applying one coat of zinc chromate primer; follow with two coats of aluminum paint or high-build bituminous paint applied at 1/16-inch thickness. Coordinate installation with manufacturer's recommendations.
- H. Install rain-caps over draining sections of the deck.
- I. Coordinate the installation of wall flashing with the following:
 - 1. Insulated Metal Wall Panel supplier and installer.
 - 2. Curtain Wall supplier and installer.
 - 3. Masonry Contractor.
- J. Care shall be taken to prevent damage or scratching during installation.

3.4 CLEANING

- A. Remove dust or other foreign matter from component surfaces; clean finishes in accordance with manufacturer's instructions.
- B. Remove surplus materials and debris from the site.
- C. Thoroughly clean canopy after installation.

3.5 PROTECTION OF INSTALLED PRODUCTS

- A. Protect finished aluminum surfaces during handling and erection of installed systems from damage by subsequent construction activities. After installation, entire system shall be left in a clean condition.
- B. Repair of Finishes: If minor damage to finishes occurs, repair damage in accordance with manufacturer's recommendations; provide replacement components if repaired finishes are unacceptable to Architect.

END OF SECTION

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SECTION 12 4816
ENTRANCE FLOOR GRILLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes recessed foot grilles and frames.
- B. Related Requirements: The following sections contain requirements related to this section:
 - 1. Division 01 "Product Substitution Procedures".
 - 2. Division 03 "Cast-In-Place Concrete" for slab depression grouting and filling for recessed foot grilles and frames.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide foot grilles and frames capable of withstanding the following loads and stresses:
 - 1. Uniform floor load of 300 lbf/sq. ft. (14.36 kN/sq. m).
 - 2. Wheel load of 350 lb (159 kg) per wheel.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for foot grilles and frames.
- B. Shop drawings in sufficient detail showing layout of grid and frame specified including details indicated construction relative to materials, direction of traffic, spline locations, profiles, anchors and accessories.
 - 1. Items penetrating floor mats and frames.
 - 2. Divisions between grille sections.
 - 3. Perimeter floor moldings.

- C. Samples: Submit an assembled section of floor grid and frame members with selected tread insert showing each type of color for exposed floor grid, frame and accessories required.
 - 1. Foot Grille: 12-inch- (300-mm-) square assembled sections.
 - 2. Frame Members: 12-inch- (300-mm-) long Sample of each type and color.
- D. Maintenance data in the form of manufacturer's printed instructions for cleaning and maintaining floor grids at Project Closeout.

1.5 QUALITY ASSURANCE

- A. Accessibility Requirements: Provide installed floor mats that comply with Section 4.5 in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."
- B. Flammability in accordance with ASTM E648, Class 1, Critical Radiant Flux, minimum 0.45 watts/m².
- C. Slip resistance in accordance with ASTM D-2047-96, Coefficient of Friction, minimum 0.60 for accessible routes.
- D. Single Source Responsibility: Obtain floor grids and frames from one source of a single manufacturer.
- E. Utilize superior structural aluminum alloys 6105-T5 for rail components.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the project site ready for use and fabricated in as large sections and assemblies as practical, in unopened original factory packaging clearly labeled to identify manufacturer.

1.7 PROJECT CONDITIONS

- A. Field measurements: check actual openings for grids by accurate field measurements before fabrication. Indicate actual measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.
- B. Coordinate frame installation with concrete construction to ensure recess and frame anchorage are accurate and that the base is level and flat. Defer frame installation until building enclosure is complete and related interior finish work is in progress.
 - 1. Coordinate size and location of recesses in concrete to receive foot grilles and frames.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace those grille and frame components that fail in material or workmanship within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ENTRANCE FLOOR GRILLS (WO1)

- A. Manufacturers: Manufacturers: Subject to compliance with requirements, provide products by one of the following for a complete system:
1. Balco Inc. **(Basis of Design)**.
 - a. Series: Mill Finish Aluminum Floor Grid w/ Abrasive Treads.
 - b. Model No.: FG-1 1/2A.
 2. Pawling Corporation; Architectural Products Division.
 - a. Series: Pro-Tek Entrance Grating.
 - b. Style: Drain-Well.
 - c. Model No.: RG-400.
 3. Ronick Matting Systems **(Approved Substitution)**
 - a. Series: Pedigrid G1
 - b. Model No. Level Base, VA abrasive grit tape.

2.2 MATERIALS

- A. Aluminum - Extruded Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6061-T6 or Alloy 6063-T5, T6, or T52 as standard with manufacturer. Coat surface of frame in contact with cementitious materials with manufacturer's standard protective coating.

2.3 FOOT GRILLES

- A. General: Provide manufacturer's standard foot-grille assemblies consisting of treads of type and profile indicated, interlocked or joined together by cross members, and with support legs (if any) and other components needed to produce a complete installation.
- B. Aluminum Foot Grilles: Provide manufacturer's standard foot grilles with extruded members, top-surfaced tread rails, and as follows:
1. Tread Rails: Extruded- aluminum tread rails with extruded-aluminum frame.
 2. Tread Rail Spacing: 1-1/2 inches (38 mm) o.c. with 1/8- to 3/16-inch- (3- to 4.8-mm wide openings between treads.
 3. Aluminum Finish: Mill.
 - a. Colors: Clear natural aluminum.
 4. Top Surface: Abrasive particles bonded to or imbedded in vinyl insert.
 - a. Colors: As selected by Architect from manufacturer's full range.
- C. Lockdown: Manufacturer's standard Hidden locking system.

2.4 FRAMES

- A. Provide manufacturer's standard frames of size and style for grille type, for permanent recessed installation in subfloor, complete with installation anchorages and accessories. Unless otherwise indicated, fabricate frame of same material and finish as grilles.

2.5 SUPPORT SYSTEM

- A. Level Bed Applications: Provide manufacturer's standard, vinyl cushion support system.

2.6 FABRICATION

- A. Shop fabricate foot grilles to greatest extent possible in sizes as indicated. Unless otherwise indicated, provide each grille as a single unit; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in grilles are necessary, space symmetrically and away from normal traffic lanes.
- B. Fabricate frame members in single lengths or, where frame dimensions exceed maximum available lengths, provide minimum number of pieces possible, with hairline joints equally spaced and pieces spliced together by straight connecting pins.

2.7 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.8 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and floor conditions for compliance with requirements for location, size, minimum recess depth, and other conditions affecting installation of foot grilles and frames.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Manufacturer shall offer assistance and guidance to provide a template of grid assemblies to ensure a proper installation.

3.3 INSTALLATION

- A. Install recessed foot grilles and frames to comply with manufacturer's written instructions at locations indicated and with top of foot grilles and frames in relationship to one another and to adjoining finished flooring as recommended by manufacturer. Set foot-grille tops at height for most effective cleaning action. Coordinate top of foot-grille surfaces with doors that swing across grilles to provide clearance under door.

3.4 CLEANING

- A. It is important to the life cycle of the entrance grille that a maintenance schedule be developed which includes regular vacuuming and extraction that correctly matches the amount of traffic the grille incurs.

3.5 PROTECTION

- A. After completing required frame installation and concrete work, provide temporary filler of plywood in recess and cover frames with plywood. Maintain protection until construction traffic has ended and project is near time of substantial completion.
- B. Defer installation of floor grilles until time of substantial completion of project.

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SECTION 26 3213
ENGINE GENERATORS - NATURAL GAS

PART 1 - GENERAL

1.1 DESCRIPTION OF SYSTEM

- A. Owner furnished/contractor installed 100kW standby power system to supply electrical power at 120/208 Volts, 60 Hertz, Three Phase. The generator shall consist of a liquid cooled natural gas engine, a synchronous AC alternator and systems controls with all necessary accessories for a complete operating system, including but not limited to the items specified hereinafter.
- B. The generator is owner furnished to be shipped to the contractor's determined destination. Contractor shall coordinate delivery schedule with the owner for installation.

1.2 SUMMARY

- A. This Section includes packaged engine-generator sets for emergency/standby power supply with the following features:
 - 1. Natural Gas.
 - 2. Unit-mounted cooling system.
 - 3. Unit-mounted control and monitoring.
 - 4. Performance requirements for sensitive loads.
 - 5. Outdoor enclosure.
- B. Related Sections include the following:
 - 1. Division 26 Section "Transfer Switches" for transfer switches including sensors and relays to initiate automatic-starting and -stopping signals for engine-generator sets.
- C. General Description of Work:
 - 1. Furnish and install one continuous/standby natural gas engine generator unit complete with starting batteries, battery chargers, insulated exhaust piping, critical mufflers, annunciator alarm panels, automatic starting and automatic transfer switches, anti-freeze, and all other apparatus, accessories, and/or material necessary for a complete installation.

2. Materials and equipment shall be standard products of manufacturers regularly engaged in production of such products and shall be the latest standard design that complies with the specification requirements. Products shall essentially duplicate those that the manufacturer has had in satisfactory use for not less than three years.
3. Generator unit shall be capable of assuming and carrying its full rated electrical load within 9 seconds or less after receiving starting signal.
4. This system shall be built, tested and shipped by the manufacturer of the generator, who has been regularly engaged in the production of the engine generator sets and associated controls for a minimum of ten years so there is one source of supply and responsibility. To be classified as a manufacturer, the builder of the generating set must manufacture at least the engine or the generator

1.3 DEFINITIONS

- A. Operational Bandwidth: The total variation from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.

1.4 SUBMITTALS

- A. Product Data: Include rated capacities, operating characteristics, and furnished specialties and accessories.
 1. Product Data: Submit manufacturer's data on engine-driven electric generator systems and components. Include manufacturer's standard product warranty for replacement of materials and equipment used in standby engine-driven generator system.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 1. Dimensioned outline plan and elevation drawings of engine-generator set and other components specified.
 2. Design Calculations: Signed and sealed by a qualified professional engineer. Calculate requirements for selecting vibration isolators and for designing vibration isolation bases.
 3. Vibration Isolation Base Details: Signed and sealed by a qualified professional engineer. Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include base weights.
 4. Wiring Diagrams: Power, signal, and control wiring.

5. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 6. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Qualification Data: For manufacturer testing .
- D. Source quality-control test reports.
1. Certified summary of prototype-unit test report.
 2. Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.
 3. Certified Summary of Performance Tests: Certify compliance with specified requirement to meet performance criteria for sensitive loads.
 4. Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements.
 5. Report of sound generation.
 6. Report of exhaust emissions showing compliance with applicable regulations.
 7. Certified Torsional Vibration Compatibility: Comply with NFPA 110.
- E. Field quality-control test reports.
- F. Operation and Maintenance Data: For packaged engine generators to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
1. List of tools and replacement items recommended to be stored at Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.
 2. Manuals shall include engine manufacturer's complete engine manual as well as alternator operation instructions. Three (3) sets of Manuals shall be provided.
- G. Warranty: Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
1. Maintenance Proximity: Not more than four hours' normal travel time from Installer's place of business to Project site.
 2. Engineering Responsibility: Preparation of data for vibration isolators restraints of engine skid mounts, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

3. Firm must maintain stock of standard spare parts, maintain staff of experienced technicians specifically trained in servicing engine-generator sets and have personnel available on 24 hour per day, 7 day per week call basis. Facilities shall be open for inspection of the Architect or his representative.
 4. The manufacturer responsibility for complete engine-generator set shall include manufacturing of engine and/or the generator, building of set, factory test, factory warranty and shipping. Coordination between manufacturer, service firm and Contractor is mandatory.
- B. Source Limitations: Obtain packaged generator sets and auxiliary components through one source from a single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with ASME B15.1.
- E. Comply with NFPA 37.
- F. Comply with NFPA 70.
- G. Comply with NFPA 99.
- H. Comply with NFPA 110 requirements for emergency power supply system.
- I. Comply with UL 2200.
- J. Engine Exhaust Emissions: Comply with applicable state and local government requirements.
- K. Noise Emission: Comply with applicable state and local government requirements for maximum noise level at adjacent property boundaries due to sound emitted by generator set including engine, engine exhaust, engine cooling-air intake and discharge, and other components of installation.
- L. Performance:
1. The performance test of the generating set series shall be in accordance with procedures certified by an independent testing laboratory. The manufacturer shall have successfully tested a prototype of a generating set series offered which will include:
 - a. Maximum power level, maximum motor starting capacity, structural soundness, torsigraph analysis per MIL-STD-705B, Method 504.2, fuel consumption, engine generator temperature rise per NEMA MG1-22.40 single step load pick up, harmonic analysis and voltage waveform

deviation per MIL-STD-705B, Method 601.4, 3-phase, short circuit test for mechanical and electrical strength.

- M. NEC Compliance: Comply with applicable standby generator requirements of NEC including, but not limited to, emergency and standby power generating systems.
- N. UL Compliance: Comply with applicable requirements of UL 1008, "Automatic Transfer Switches". Provide standby generator system components, including automatic transfer switches, which are UL-listed and labeled.
- O. ANSI/NEMA Compliance: Comply with applicable requirements of ANSI/NEMA MG 1, "Motors and Generators".
- P. IEEE Compliance: Comply with applicable portions of IEEE Standard 241, "IEEE Recommended Practice for Electric Power Systems in Commercial Buildings" pertaining to standby power.

1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:
 - 1. Ambient Temperature: 5 to 40 deg C.
 - 2. Relative Humidity: 0 to 95 percent.
 - 3. Altitude: Sea level to 1000 feet.

1.7 COORDINATION

- A. Coordinate size and location of steel frame for package engine generators. Elevate frame to allow for future roof repair.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

1.9 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide 24 months' full maintenance by skilled employees of manufacturer's designated service organization. Include quarterly exercising to check for proper starting, load transfer, and running under load. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Provide parts and supplies same as those used in the manufacture and installation of original equipment.

1.10 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Fuses: One for every 10 of each type and rating, but no fewer than one of each.
 - 2. Indicator Lamps: Two for every six of each type used, but no fewer than two of each.
 - 3. Filters: One set each of lubricating oil, fuel, and combustion-air filters.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide comparable product by one of the following:
 - 1. Caterpillar; Engine Div.
 - 2. Generac Power Systems, Inc.
 - 3. Kohler Co.; Generator Division.
 - 4. Onan/Cummins Power Generation; Industrial Business Group.

2.2 ENGINE-GENERATOR SET

- A. Factory-assembled and -tested, engine-generator set.
- B. Mounting Frame: Maintain alignment of mounted components without depending on concrete foundation; and have lifting attachments.

1. Rigging Diagram: Inscribed on metal plate permanently attached to mounting frame to indicate location and lifting capacity of each lifting attachment and generator-set center of gravity.

C. Capacities and Characteristics:

1. Power Output Ratings: Nominal ratings as indicated, with capacity as required to operate as a unit as evidenced by records of prototype testing.
2. Output Connections: Three-phase, four wire.
3. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component.

D. Generator-Set Performance:

1. Steady-State Voltage Operational Bandwidth: 3 percent of rated output voltage from no load to full load.
2. Transient Voltage Performance: Not more than 20 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within three seconds.
3. Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.
4. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
5. Transient Frequency Performance: Less than 5 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within five seconds.
6. Output Waveform: At no load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for single harmonics. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.
7. Sustained Short-Circuit Current: For a 3-phase, bolted short circuit at system output terminals, system shall supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to generator system components.
8. Start Time: Comply with NFPA 110, Type 10, system requirements.

2.3 ENGINE

- A. Fuel: Natural gas.
- B. Rated Engine Speed: 1800 rpm.
- C. Maximum Piston Speed for Four-Cycle Engines: 2250 fpm.

- D. Lubrication System: The following items are mounted on engine or skid:
1. Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
 2. Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.
 3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.
- E. Coolant Jacket Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity. Supply voltage shall be 208-Volts, Single-Phase.
- F. Governor: Adjustable isochronous, with speed sensing.
- G. Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine-generator-set mounting frame and integral engine-driven coolant pump.
1. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
 2. Size of Radiator: Adequate to contain expansion of total system coolant from cold start to 110 percent load condition.
 3. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gage glass and petcock.
 4. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
 5. Coolant Hose: Flexible assembly with inside surface of nonporous rubber and outer covering of aging-, ultraviolet-, and abrasion-resistant fabric.
 - a. Rating: 50-psig (345-kPa) maximum working pressure with coolant at 180 deg F (82 deg C), and noncollapsible under vacuum.
 - b. End Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.
- H. Muffler/Silencer: Critical type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.
- I. Air-Intake Filter: Heavy-duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.
- J. Starting System: 24-V electric, with negative ground.

1. Components: Sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum specified in Part 1 "Project Conditions" Article.
2. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
3. Cranking Cycle: As required by NFPA 110 for system level specified.
4. Battery: Adequate capacity within ambient temperature range specified in Part 1 "Project Conditions" Article to provide specified cranking cycle at least three times without recharging.
5. Battery Cable: Size as recommended by engine manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.
6. Battery Compartment: Factory fabricated of metal with acid-resistant finish and thermal insulation. Thermostatically controlled heater shall be arranged to maintain battery above 10 deg C regardless of external ambient temperature within range specified in Part 1 "Project Conditions" Article. Include accessories required to support and fasten batteries in place.
7. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 35-A minimum continuous rating.
8. Battery Charger: Current-limiting, automatic-equalizing and float-charging type. Unit shall comply with UL 1236 and include the following features:
 - a. Operation: Equalizing-charging rate of 10 A shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.
 - b. Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 40 deg C to plus 60 deg C to prevent overcharging at high temperatures and undercharging at low temperatures.
 - c. Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.
 - d. Ammeter and Voltmeter: Flush mounted in door. Meters shall indicate charging rates.
 - e. Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.
 - f. Enclosure and Mounting: NEMA 250, Type 1, wall-mounted cabinet.
 - g. A 120-volt, 20-ampere dedicated circuit shall feed Battery Charger.

2.4 CONTROL AND MONITORING

- A. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in the automatic transfer switch initiate starting and stopping of generator set. When mode-selector switch is switched to the on position, generator set starts. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down generator set.
- B. Manual Starting System Sequence of Operation: Switching on-off switch on the generator control panel to the on position starts generator set. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down generator set.
- C. Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common control and monitoring panel mounted on the generator set. Mounting method shall isolate the control panel from generator-set vibration.
- D. Indicating and Protective Devices and Controls: As required by NFPA 110, and the following:
1. AC voltmeter.
 2. AC ammeter.
 3. AC frequency meter.
 4. DC voltmeter (alternator battery charging).
 5. Engine-coolant temperature gage.
 6. Engine lubricating-oil pressure gage.
 7. Running-time meter.
 8. Ammeter-voltmeter, phase-selector switch(es).
 9. Generator-voltage adjusting rheostat.
 10. Start-stop switch.
 11. Overspeed shutdown device.
 12. Coolant high-temperature shutdown device.
 13. Coolant low-level shutdown device.
 14. Oil low-pressure shutdown device.
 15. Generator overload.
- E. Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator, unless otherwise indicated.

- F. Common Remote Audible Alarm: Signal the occurrence of any events listed below without differentiating between event types. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset.
1. Engine high-temperature shutdown.
 2. Lube-oil, low-pressure shutdown.
 3. Overspeed shutdown.
 4. Remote emergency-stop shutdown.
 5. Engine high-temperature prealarm.
 6. Lube-oil, low-pressure prealarm.
 7. Low coolant level.
- G. Remote Alarm Annunciator: Comply with NFPA 99. An LED labeled with proper alarm conditions shall identify each alarm event and a common audible signal shall sound for each alarm condition. Silencing switch in face of panel shall silence signal without altering visual indication. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset. Cabinet and faceplate are surface- or flush-mounting type to suit mounting conditions indicated. Locate adjacent to Fire Alarm Annunciator Panel (see plans for exact location).

2.5 GENERATOR OVERCURRENT AND FAULT PROTECTION

- A. Generator Circuit Breaker: Molded-case, thermal-magnetic type; 100 percent rated; complying with NEMA AB 1 and UL 489.
1. Tripping Characteristic: Designed specifically for generator protection.
 2. Trip Rating: Matched to generator rating.

2.6 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

- A. Comply with NEMA MG 1.
- B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.
- C. Electrical Insulation: Class H or Class F.
- D. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.
- E. Enclosure: Dripproof.

- F. Instrument Transformers: Mounted within generator enclosure.
- G. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified.
 - 1. Adjusting rheostat on control and monitoring panel shall provide plus or minus 5 percent adjustment of output-voltage operating band.
- H. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.
- I. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.
- J. Subtransient Reactance: 12 percent, maximum.

2.7 OUTDOOR GENERATOR-SET ENCLOSURE

- A. Sound Attenuated Outdoor Weather-Protective Enclosure
 - 1. The generator set shall be provided with an outdoor enclosure. The package shall comply with the requirements of the National Electrical Code for all wiring materials and component spacing. The total assembly of generator set and enclosure shall be designed to be lifted into place using spreader bars. Housing shall provide ample airflow for generator set operation at rated load in an ambient temperature of 104F. The housing shall have hinged access doors as required to maintain easy access for all operating and service functions. All doors shall be lockable, and include retainers to hold the door open during service. Enclosure roof shall be cambered to prevent rainwater accumulation. Openings shall be screened to limit access of rodents into the enclosure. All electrical power and control interconnections shall be made within the perimeter of the enclosure. The enclosure shall reduce the sound level of the generator set, while operating at full rated load, by 25 dBA at any location 7 meters from the generator set in a free field environment. Insulation in the enclosure shall be made with non-hydroscopic materials.
 - 2. All sheet metal shall be primed for corrosion protection and finish painted with the manufacturers standard color using a powder coat paint process, or equal meeting the performance requirements specified below. All surfaces of all metal parts shall be primed and painted.
 - 3. Enclosure shall be constructed of minimum 12 gauge steel for framework and 14 gauge steel for panels. All hardware and hinges shall be stainless steel. If generator set is mounted on an open floor structure (platform), a floor must be included with the generator set.

4. A factory-mounted, critical grade exhaust silencer shall be installed inside of the enclosure. Mufflers, bracketry, exhaust tubing and all fittings shall be designed and furnished as a complete assembly. Exhaust connections to the generator set shall be through seamless flexible connections. It shall be mounted horizontally by the Contractor, who shall terminate the exhaust outlets with a 45 degree undercut pipe extension beyond the end of the outdoor enclosure, or if need be, a 90 degree upturn with a suitable rain cap above the roof.
 5. The enclosure shall include the following maintenance provisions:
 - Flexible coolant and lubricating oil drain lines, that extend to the exterior of the enclosure, with internal drain valves
 - External radiator fill provision.
- B. Engine Cooling Airflow through Enclosure: Maintain temperature rise of system components within required limits when unit operates at 110 percent of rated load for 2 hours with ambient temperature at top of range specified in system service conditions.
1. Louvers: Fixed-engine, cooling-air inlet and discharge. Storm-proof and drainable louvers prevent entry of rain.
- C. Provide inside the enclosure the following:
1. Two (2) duplex GFI receptacles on opposite sides of enclosure.
 2. Two (2) compact fluorescent, vaportight "jelly jar" light fixtures (Lumark PL-VS-W-GG-26-UNV-LL or approved equal).
 3. Two three-way switches with weatherproof covers on opposite sides of enclosures controlling light fixtures.

2.8 VIBRATION ISOLATION DEVICES

- A. Restrained Spring Isolators: Freestanding, steel, open-spring isolators.
1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to wind loads or if weight is removed; factory-drilled baseplate bonded to 1/4-inch-thick, elastomeric isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
 2. Outside Spring Diameter: Not less than 80 percent of compressed height of the spring at rated load.
 3. Minimum Additional Travel: 50 percent of required deflection at rated load.
 4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.

5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

2.9 FINISHES

- A. Indoor and Outdoor Enclosures and Components: Manufacturer's standard finish over corrosion-resistant pretreatment and compatible primer.

2.10 SOURCE QUALITY CONTROL

- A. Prototype Testing: Factory test engine-generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.

2.11 SAFETY SHUTDOWN MONITORING SYSTEM

- A. The electric generating plant shall be provided with automatic safety shutdowns including individual alarm terminals plus individual indicating lights revealing which safety caused shutdown. This monitoring system shall include six safeties:
 1. Low oil pressure
 2. High engine temperature
 3. Overspeed
 4. Low coolant level
 5. Fail to crank
 6. Overcrank
- B. The low oil pressure and high engine temperature shall be pre-alarm types indicating danger is being approached prior to plant shutdown. When the danger point is reached, the plant shall shutdown. System shall be designed to signal the remote alarm annunciator panel as specified.

2.12 ELECTRIC PLANT MOUNTING

- A. The electric plant shall be mounted on welded steel base which shall permit suitable mounting to any level surface.

2.13 BATTERIES

- A. Two 12-volt, 225 ampere-hour heavy duty lead acid starting batteries with electrolyte shall be provided.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine-generator performance.
- B. Examine roughing-in of piping systems and electrical connections. Verify actual locations of connections before packaged engine-generator installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with packaged engine-generator manufacturers' written installation and alignment instructions and with NFPA 110.
- B. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.
- C. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.
- D. Install standby engine-generator sets as indicated, in accordance with the equipment manufacturer's written instructions, and with recognized industry practices, to ensure that engine-generator sets fulfill requirements. Comply with NFPA and NEMA standards pertaining to installation of standby engine-generator systems and accessories.
- E. Coordinate with other work, including fuel tanks, piping and accessories, as necessary to interface installation of standby generator system work with other work.
- F. Install units on vibration isolators; comply with manufacturer's indicated installation method if any.
- G. Connect fuel oil piping to standby generator equipment as indicated, and comply with manufacturer's instructions where not otherwise indicated.
- H. Align shafts of engine and generator within tolerances recommended by equipment manufacturer.

3.3 CONNECTIONS

- A. Piping installation requirements are specified in Division 23 Sections. Drawings indicate general arrangement of piping and specialties.
- B. Connect engine exhaust pipe to engine with flexible connector.
- C. Connect fuel piping to engines with a gate valve and union and flexible connector.
 - 1. Natural-gas piping, valves, and specialties for gas distribution are specified in Division 23 Section "Facility Natural-Gas Piping."
- D. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- E. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.4 GROUNDING

- A. Provide equipment grounding connections, sufficiently tight to assure a permanent and effective ground, for system components as indicated.

3.5 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 - 1. Upon completion of installation of engine-generator system and after building circuitry has been energized with normal power source, test engine-generator to demonstrate standby capability and compliance with requirements. Where possible, field correct malfunctioning units, then retest to demonstrate compliance.
 - 2. Supplier of the electric generating plant and associated items covered herein shall provide factory trained technicians to check out the completed installation and perform the initial start up of the system. They shall meet with the contractor to discuss the installation prior to his beginning the installation.
 - 3. Perform tests recommended by manufacturer and each electrical test and visual and mechanical inspection for "AC Generators and for Emergency Systems" specified in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 4. After the initial start up and check out of the standby power system by the Supplier, when the contractor considers the system to be in satisfactory operating condition, he shall notify the Architect that the system is ready for

Load Testing and demonstration to the Owner's Personnel. The contractor shall furnish Load Banks as required to perform the following:

- a. Test speed and voltage regulation for instantaneous on and off load changes with load of 1/4, 1/2, 3/4 and full load rating.
 - b. Continuous operational test at full load for not less than three hours with voltage, frequency, oil pressure and engine temperature being recorded at no load beginning of test, and hourly thereafter thru duration.
 - c. After the above tests have been performed, reconnect the generator to Building Loads and test complete system for proper operation with Emergency Loads.
 - d. All electrical connections are to be made by the contractor.
5. Battery Tests: Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.
 6. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
 7. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine-generator system before and during system operation. Check for air, exhaust, and fluid leaks.
 8. Exhaust-System Back-Pressure Test: Verify that back pressure at full-rated load is within manufacturer's written allowable limits for the engine.
 9. Exhaust Emissions Test: Comply with applicable government test criteria.
 10. Voltage and Frequency Transient Stability Tests: Measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.
- B. Coordinate tests with tests for transfer switches and run them concurrently.
 - C. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - D. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - E. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - F. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.
 - G. Report results of tests and inspections in writing.
- 3.6 DEMONSTRATION**
- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generator.

END OF SECTION

REVISED GEOTECHNICAL INVESTIGATION

PROPOSED ST. JOHN THE BAPTIST PARISH

WESTBANK SAFETY COMPLEX

5733 HIGHWAY LA-18

WALLACE, LOUISIANA

TBG PROJECT NO. 4988G

PREPARED FOR:

ST. JOHN PARISH OFFICE OF FIRE SERVICES

LAPALCE, LOUISIANA



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September 14, 2018

St. John Parish Office of Fire Services
1801 West Airline Hwy.
LaPlace, LA 70068

Attn: Mr. Cain Dufrene

Reference: Revised Report of Geotechnical Investigation
Proposed St. John the Baptist Parish Westbank Public Safety Complex
5733 Highway La-18
Wallace, LA
TBG Report No. 4988G

Dear Mr. Dufrene:

The Beta Group, LLC (TBG) has performed a Geotechnical Investigation for the above referenced site in Wallace, Louisiana. As authorized by your office, this project was performed in accordance with our proposal dated May 24, 2018. The attached report presents our understanding of the project, reviews our exploration procedures, describes existing site and general subsurface conditions, and presents our evaluations and recommendations.

We have enjoyed working with you on this project and look forward to assisting you during the continuing design and construction activities. Please feel free to contact us if you have any questions regarding this report or need further service.

Sincerely,
THE BETA GROUP, LLC


Alex Jaramillo, P.E.
Senior Project Engineer




Anjelica Moran, E.I.
Project Engineer

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PURPOSE AND SCOPE OF SERVICES

PURPOSE OF STUDY

The purpose of the Geotechnical Investigation was to explore the subsurface conditions at the site and to provide geotechnical design recommendations for the proposed St. John the Baptist Parish Westbank Public Safety Complex, site preparation, earthwork and quality control measures related to these design aspects.

SCOPE OF SERVICES

To accomplish the stated purposes, we executed the following:

1. Documented existing surface conditions and features at the project site and the marked boring locations.
2. Performed a subsurface exploration consisting of three (3) undisturbed soil test borings, each to a depth of 70 ft. below the existing ground surface in the general area of the proposed Public Safety Complex.
3. Performed laboratory testing on selected soil samples to ascertain soil properties for engineering purposes.
4. Evaluated the findings of the subsurface exploration and laboratory data relative to general subsurface characterization, support, and other geotechnical aspects of the project.

Our scope of services did not include a survey of boring locations and elevations, quantity estimates, preparation of plans or specifications, or the identification and evaluation of environmental aspects of the project site.

PROPOSED PROJECT DESCRIPTION

The project will consist of a new single story Public Safety Complex, which will be 6,070 sq. ft. in plan dimension. The site is located at 5733 Highway La-18 in Wallace, La. Design structural loads are as follows: Maximum column loads of 30 kips downward and 15 kips for uplift. Floor live loads of 100 lbs. per sq. ft., and Apparatus bay floor live loads of 250 lbs. per sq. ft. We also

understand that 3 ft. of fill or less will be needed to raise the site grade in the area of the new Public Safety Complex.

SUBSURFACE EXPLORATION

FIELD EXPLORATION

The subsurface exploration consisted of three (3) undisturbed soil test borings (designated as B-1 thru B-3) performed on July 19th thru 23rd, 2018 at the referenced site and at the approximate locations shown on the attached Boring Location Plan (Figure No. 1).

The soil test boring locations were located in the field by a TBG representative, based on a site plan provided by Mr. Cain Dufrene of St. John Parish, and by making measurements from known site features. The boring locations were plotted and topographical information was estimated. The methods used in the determination of the boring locations shown on the Boring Location Plan should be considered approximate.

The soil test borings were drilled utilizing a truck mounted drill rig at the designated locations shown on the Boring Location Plan. Undisturbed sampling was performed continuously in the upper 10 ft. and on 5 ft. centers thereafter, with a 3 in. diameter thin-walled tube sampler. Representative samples were removed from the tubes and placed in moisture-proof containers for laboratory testing.

When cohesionless material was encountered, which could not be sampled by undisturbed methods, the Standard Penetration Test was performed. This test consists of driving a two inch diameter splitspoon sampler 1 ft. (after first seating it 6 in.) with a 140 lb. hammer falling 30 in. The number of blows required to drive the sampler gives an indication of the density of the material.

The soil test borings were advanced through the soil overburden to the assigned termination depths of 70 ft. below the existing ground surface.

Subsurface water level readings were obtained at the soil test boring locations immediately upon completion of the drilling process and after a period of 15 minutes. Upon completion of the drilling activities, the boreholes were backfilled with auger cuttings (soil) and/or high-strength concrete as per LADOTD requirements.

LABORATORY TESTING

Laboratory tests were conducted on selected samples in general accordance with ASTM standards.

The laboratory testing performed for this project consisted of:

- Atterberg Limits
- Unconfined Compression Tests
- Unit Weight Determination
- Natural Moisture Content
- Percent Passing the #200 Sieve

The test results are summarized on the individual Boring Logs in the Appendix of this report.

SITE AND SUBSURFACE CONDITIONS

SITE CONDITIONS

TBG performed reconnaissance of the site. The site is located at 5733 Highway La-18 in Wallace, Louisiana in an open grassy area.

SUBSURFACE CONDITIONS

Boring B-1: Reference to the log of boring B-1 shows that beginning at the ground surface, there is 2 ft. of medium stiff gray silty clay with organics. This clay is underlain by soft to medium stiff gray and light brown clay with silt to the 6 ft. depth. This clay is followed by a 12 ft. layer of soft to medium stiff gray and light brown silty clay. This silty clay is underlain by soft gray silty clay to the 26 ft. depth. This clay is proceeded by soft to medium stiff gray sandy clay to the 36 ft. depth. This clay is followed by stiff gray sandy clay to the 42 ft. depth which is underlain by medium dense to dense gray silty sand to at least the boring's termination depth of 70 ft.

Boring B-2: Reference to the log of boring B-2 shows that beginning at the ground surface, there is 2 ft. of medium stiff dark gray silty clay with shells and organics followed by medium stiff gray silty clay with organics to the 12 ft. depth. This silty clay is underlain by soft to medium stiff gray and light brown silty clay to the 16 ft. depth. This clay is proceeded by very soft gray and light brown silty clay to the 22 ft. depth. This clay is followed by loose gray clayey sand to the 27

ft. depth. This clayey sand is underlain by stiff to very stiff gray sandy clay to the 38 ft. depth. This clay is proceeded by medium stiff gray sandy clay to the 42 ft. depth. This sandy clay is followed by medium dense gray silty sand to at least the boring's termination depth of 70 ft.

Boring B-3: Reference to the log of boring B-3 shows that beginning at the ground surface, there is 2 ft. of medium stiff gray sandy clay with shells, rocks, organics, and concrete followed by medium stiff gray silty clay with shells, rocks and organics to the 4 ft. depth. This silty clay is underlain by medium stiff gray and light brown clay with organics to the 6 ft. depth. This clay is proceeded by soft to medium stiff gray and light brown silty clay with organics to the 10 ft. depth. This clay is followed by very soft to soft gray and light brown silty clay to the 22 ft. depth. This clay is underlain by medium stiff gray and light brown silty clay with sand seams to the 26 ft. depth. This layer is proceeded by medium dense gray silty sand to at least the boring's termination depth of 70 ft.

GROUNDWATER CONDITIONS

At the time of making the borings, subsurface water was encountered between the 12 ft. to 13 ft. depths below the existing ground surface in borings B-1 thru B-3. After a 15 minute wait period, groundwater was measured at the approximate 6 ft. to 7 ft. depths. It should be noted that groundwater levels tend to fluctuate with seasonal and climatic changes, as well as with some types of construction operations. As such, groundwater levels at other times of the year may be different than those described in this report. These observations were made while completing the borings and may not have become fully static at the time of measurement. If groundwater is important to construction, it should be measured at that time.

ENGINEERING EVALUATION & RECOMMENDATIONS

The following evaluations and recommendations are based on our observations at the site, interpretation of the field and soil laboratory data obtained during this exploration, and our experience with similar subsurface conditions and projects. Subsurface conditions in unexplored locations may vary from those encountered. If the project location or design information changes, we request that we be advised so that we may re-evaluate our recommendations.

Design recommendations for the proposed Public Safety Complex for the given location are dependent on the soil and site conditions. The subsurface exploration aids the geotechnical engineer in determining the necessary geotechnical recommendations needed. In addition,

since the method of construction greatly affects the soils intended for the proposed Public Safety Complex, consideration must be given to the implementation of suitable methods of site preparation, pile driving, and other aspects of construction. Based on our analysis, it is our opinion that the proposed site is suitable for the planned construction.

The near surface soils that were encountered below the existing ground surface are poor in bearing quality and are compressible even under nominal loading. In view of this, it is our opinion that piles should be used for support of all structural loads that cannot tolerate settlements. Analyses were made with regard to piles and results of these analyses are given in the subsequent sections.

DEEP FOUNDATION

Analyses were made based on the borings and laboratory tests data to develop geotechnical related parameters for use in design of the foundations. These include an evaluation of pile capacities for 7 in. diameter tip timber piles (ASTM D 25), and estimates of settlement. Results of these analyses are given in the following sections. Allowable pile load capacities for driven treated ASTM D 25 quality timber piles are provided in the following tables. The allowable pile capacities assume the piles are vertical and do not include the weight of the pile. In addition, pile tip depths are referenced from the top of the imported fill but include a cut-off depth of approximately 2 ft. The piles will develop their capacity through "skin friction" support along their embedded length, but will also receive additional "point support" if piles are firmly embedded in the sand beginning at the approximate 45 ft. depth below the existing ground surface in the areas of borings B-1 and B-2, and the approximate 30 ft. depth below the existing ground surface in the area of boring B-3.

**ALLOWABLE PILE LOAD CAPACITIES IN LOCATIONS
OF BORINGS B-1 AND B-2**

SIZE OF TREATED ASTM D 25 QUALITY TIMBER PILE*	PILE TIP EMBEDMENT BELOW THE GROUND SURFACE(FEET)	ESTIMATED ALLOWABLE SINGLE PILE LOAD CAPACITIES IN TONS COMPRESSION FACTOR OF SAFETY = 2 TENSION FACTOR OF SAFETY = 3	
		COMPRESSION	TENSION
7-In. Dia. Tip & 12-In. Dia. Butt	20	5	3
	25	6	4
	30	8	5
	35	10	7
	40	12	8
	45**	17	10
	50**	21	13
	55**	24	15
	60**	29	17
	65**	32	19
70**	33	22	

*These are soil-pile related values and consideration should be given to the structural integrity of the pile member.

** Pile tip firmly embedded in the sand

**ALLOWABLE PILE LOAD CAPACITIES IN LOCATION
OF BORING B-3**

SIZE OF TREATED ASTM D 25 QUALITY TIMBER PILE*	PILE TIP EMBEDMENT BELOW THE GROUND SURFACE(FEET)	ESTIMATED ALLOWABLE SINGLE PILE LOAD CAPACITIES IN TONS COMPRESSION FACTOR OF SAFETY = 2 TENSION FACTOR OF SAFETY = 3	
		COMPRESSION	TENSION
7-In. Dia. Tip & 12-In. Dia. Butt	20	5	3
	25	6	4
	30**	10	6
	35**	13	7
	40**	14	9
	45**	18	11
	50**	22	13
	55**	27	16
	60**	32	19
	65**	36	22
70**	38	25	

These are soil-pile related values and consideration should be given to the structural integrity of the pile member.

** Pile tip firmly embedded in the sand

The provided compression capacities contain an estimated factor of safety of two (2) against failure of a single pile through the soil. The provided tension capacities contain an estimated factor of safety of three (3) against failure of a single pile through the soil. The analyses for pile capacities are based on a soil-pile relationship only. The structural capacities of the piles and their connections to transmit these loads should be determined by a structural engineer.

All loads from the Public Safety Complex should be supported on piles having the same approximate tip embedment depth below the existing ground surface in order to minimize potential differential settlement. Pile driving will cause vibrations that may affect nearby structures or pavements. TBG should be contacted to monitor the effects of pile driving on adjacent structures.

ESTIMATED SETTLEMENT OF PILE FOUNDATIONS

No detailed settlement analyses were made since the pile length, pile layout, etc. are not known at this time. However, settlement of the pile supported Public Safety Complex using the recommended pile load capacities, in single widely spaced rows or in clusters, of up to 6 to 8 piles, are estimated to be on the order of ½ to 1 in. Settlements will increase with the size of the pile cluster and, if larger clusters of closely spaced piles are needed for support, detailed settlement analyses should be made.

Our estimates do not include the elastic deformation of the piles, which should be added to the settlement estimates. Elastic deformation of the piles may be estimated at 67% of the static column strain of a pile acting as a column.

In the event any of our assumptions are not valid, TBG should be contacted to evaluate the potential effects on settlement of pile foundations.

PILE DRIVING

Driving of timber piles having a 7 in. diameter tip and a 12 in. diameter butt should be limited to the rate of 25 blows per foot using a maximum of 12,000 to 15,000 ft-lbs of energy per blow. These recommendations are given in order to minimize possible damage to the piles.

Piles with tips above the medium dense to dense silty sand should be able to be driven with normal effort not exceeding the above limitations. Driving of timber piles into the sand could be erratic due to the variation of depths. If piles with tips in the sand are selected for design, it is recommended that probe type piles be driven throughout the site to establish driving characteristics, to verify the good density of the sand stratum throughout the site and to establish pile lengths. While it is believed the piles could be driven several feet into the sand without severe damage, the piles should be closely observed and, if "refusal" or little or no penetration under several successive blows occurs, driving should be ceased. The probe piles should be of the same type and size as the job piles and should be installed with the same equipment and techniques that would be used to install the job piles.

Piles may achieve refusal beginning at the 45 ft. in the area of borings B-1 and B-2, and the 30 ft. depth in the area of Boring B-3, due to the presence of the medium dense to dense silty sand stratum. Predrilling may be needed to reach the desired pile tip elevation. If predrilling is needed, the drilling bit should not exceed 75% of the pile tip diameter.

It is important that inspection and monitoring of piles be done by a qualified soil technician so as to detect unexpected conditions indicated by the driving resistance (hammer blows per foot) as well as any potential problems with breakage or driving difficulties.

DRAG LOAD

When fill is placed on the site, the underlying compressible soils consolidate, resulting in surface settlement. As the compressible soils consolidate, "negative skin friction" or downdrag may be imparted on piles. This could result in an extraneous load, additive to any structural load, on the piles and could increase settlements of the structure. It is our opinion that drag load is dependent on the thickness of fill, compressibility of the soils, time-rate of consolidation and pile length. If 3 ft. of new fill or less is required, drag load should be unimportant to design. However, it is recommended that this fill be placed as soon as practical prior to construction. If more than 3 ft. of new fill is required, further consideration should be given to the effects of drag load.

GROUP EFFECT

The effect of pile grouping on the single pile load capacities is dependent on pile spacing, pile length and soil characteristics throughout the pile length and below the pile tips. All piles should have a minimum center-to-center spacing of at least three (3) pile diameters or center to center spacing of 3 ft., whichever is greater. Group effect should be unimportant for pile clusters of up to 8 piles. Group effect could become important for larger clusters and should be evaluated when actual pile layouts are known.

MINIMUM PILE SPACING

$$\text{SPAC} = 0.05 L_1 + 0.025 L_2 + 0.0125 L_3$$

SPAC (ft.) = Center to center spacing of piles = (Min. 3.0 ft.)

L_1 = Pile penetration in ft. up to 100 ft.

L_2 = Pile penetration in ft. from 101 to 200 ft.

L_3 = Pile penetration in ft. from 201 to 300 ft

ALLOWABLE GROUP CAPACITY*

$$Q_a = \frac{P \times L \times c}{\text{FSF}} + \frac{2.6 \times q_u \times (1 + 0.2 \frac{w}{b}) \times A}{\text{FSB}}$$

P = Perimeter distance of pile group (ft.)

L = Length of pile (ft.)

c = Average (weighted) shear strength ($\frac{1}{2} q_u$)
of soil throughout pile length (lbs./sq. ft.)

q_u = Unconfined compressive strength of soils
below pile tips (lbs./sq.ft.)

w = Width of base of pile group (ft.)

b = Length of base of pile group (ft.)

A = Base area of pile group (sq. ft.)

FSF = Factor of safety for friction area = 2

FSB = Factor of safety for base area = 3

*In no case should the recommended single pile
load capacity be exceeded.

VIBRATION MONITORING

Pile driving will cause vibrations that may affect nearby buildings and utilities. Pile driving should be monitored at any structure of concern during the driving of the job piles to record their magnitude of vibrations. Sustained peak particle velocities of 0.25 in. per second measured at a structure may induce damage to the structure. Therefore, for sustained peak particle velocities in excess of 0.25 in. per second pile driving operations should be terminated and consideration given to altering the pile installation criteria.

SEISMIC SITE CLASSIFICATION

There is no evidence disclosed by available seismic data to indicate surface faulting will affect structures at this particular site. Seismic issues were researched in accordance with the International Building Code (IBC).

Based on the information contained in Borings B-1 thru B-3 and our experience at the site, we recommend the site be classified as Site Class "E" in accordance with the IBC.

PAVEMENT IMPROVEMENT

It is understood that areas adjacent to the proposed Public Safety Complex will be improved with rigid (concrete) pavement to allow for vehicular traffic. It is understood this area will be subjected to approximately 5 to 10 vehicles and 2 heavy duty vehicles per day. Based on the soil borings, it is believed that the near surface cohesive soils could be assigned a Coefficient of Subgrade Reaction (k value) of 100 lbs. per sq. in. for rigid pavement design. This assumes that the existing ground surface is stripped of all vegetation, soft or loose surface soil, deleterious materials, etc. and is well drained prior to construction of the new pavement. Any new fill needed to replace the excavated material or to raise the pavement grade could consist of a good quality compacted granular material. This compacted fill will provide a good base for rigid (concrete) pavement.

The importance of good drainage cannot be over-emphasized. Construction of the pavement improvement should only be attempted when this subgrade is dry and stable and after good drainage has been established in the area. If these near surface soils are not well drained prior to and during construction, "pumping" may occur which would inhibit proper compaction of the pavement base. In this case, they would have to be stripped from the site and replaced with pavement base material. A geotextile fabric could be placed beneath the pavement improvement base to separate it from the soil subgrade.

CONCRETE PAVEMENT

For areas restricted to vehicle parking stalls, it is recommended that a concrete thickness of at least 6 inches be considered for design. For areas subjected to the Mobile Command Center and Ambulances, a concrete thickness of at least 8 inches is recommended for design. It is further recommended that the concrete thickness be increased to 10 inches within the areas

subjected to Fire Truck traffic. This concrete thickness assumes an ultimate flexural strength for the concrete of at least 600 lbs. per sq. inch and that the concrete is at least wire-mesh reinforced.

It is recommended that the concrete pavement be underlain by a base or leveling course of at least 12 in. of good quality granular material. This could consist of "pumped" river sand having less than 10% fines passing the No. 200 Sieve. This granular material should be compacted to a minimum dry density of 95% of its maximum dry density as determined by ASTM D 698A. This material should be placed in 6 in. loose lifts and in-place density tests should be taken to assure that this degree of compaction is achieved. The base course should be constructed over a prepared subgrade. The base material should overlay a geotextile fabric to allow for separation with the existing subgrade.

Reference is also made to the State of Louisiana, Department of Transportation and Development, Standard Specifications for Roads and Bridges, Latest Edition for additional guidelines and recommendations regarding pavement design and construction. This includes subgrade preparation; drainage and stripping; pavement materials (concrete, base, etc.); placement method and compaction requirements; paving equipment; and conditions; etc.

Any poor-quality material should be excavated and removed, along with any soft or disturbed natural subgrade soils. This should be replaced with good quality granular material. Any new granular fill should meet the requirements given above.

PAVEMENT CONSTRUCTION

It is our opinion that the methods, means and sequence of construction of the pavement improvement are the responsibility of the contractor who should be experienced in this type construction. The geotechnical recommendations given herein with regard to concrete and base thicknesses for the new pavement improvement are based on the provide traffic conditions. This includes the recommended total thicknesses for areas restricted to automobiles and light concentrations of heavier traffic (Fire trucks, delivery trucks, garbage trucks, etc.). However, it should be recognized that the fully or partially constructed pavement improvement may be subjected to heavier construction equipment, such as bulldozers, rollers,

dump trucks, concrete trucks, etc. Therefore, appropriate measures should be taken by the contractor in terms of site preparation, base placement and compaction, selection of paving equipment to assure the performance of the pavement improvement during and after construction.

GEOTEXTILE

If a geotextile is needed it should be a non-woven fabric with an apparent opening size (AOS) smaller than the U.S. No. 70 sieve. The geotextile should be able to retain the underlying soil without clogging.

EARTHWORK CONSIDERATIONS

The site will require earthwork associated with grading and backfill. The following paragraphs provide pertinent recommendations associated with potential earthwork activities.

SITE PREPARATION

Significant site preparation problems will develop unless good drainage is provided throughout the project duration. Proper site drainage should be maintained during and after construction. Providing drainage during the construction process will facilitate construction by reducing the potential for compaction problems.

FILL MATERIALS

We recommend a select fill material free from debris, deleterious material or organic matter be used as backfill. This could consist of "pumped" river sand having less than 10% fines passing the No. 200 Sieve. This fill should be placed in 6 in. loose lifts and compacted to at least 95% of Maximum Dry Density at Optimum Moisture Content according to ASTM D-698A.

In-place density measurements should be taken to assure that this degree of compaction is achieved. Reference is also made to the State of Louisiana, Department of Transportation, and Standard Specifications for Roads and Bridges, Latest Edition for additional guidelines and recommendations regarding building construction. This includes subgrade preparation; stripping; placement method and compaction requirements; and general construction conditions; etc.

QUALITY CONTROL

The use of the correct fill materials and the proper placement and compaction are critical in any earthwork where subsequent construction of driveways or structures is planned. Construction monitoring by a qualified geotechnical engineer or technician is recommended to document that proper fill construction has been accomplished.

The responsibilities of the quality control representative generally include observation of excavations, documentation of material types, and fill placement and compaction techniques. The geotechnical engineer or technician should make sure the fill is the proper material type and is placed in the correct manner. Any deviation from the design should be reported to the design engineer.

CONSTRUCTION QUALITY CONTROL

The Geotechnical Engineer of record should be retained to monitor and test earthwork activities, pile driving activities, subgrade preparations, as well as any additional construction activities. We recommend that TBG be employed to monitor the earthwork construction, and to report that the recommendations contained in this report are completed in a satisfactory manner. Our continued involvement on the project will aid in the proper implementation of the recommendations discussed herein. The following is a recommended scope of services:

- Review of project plans and construction specifications to verify that the recommendations presented in this report have been properly interpreted and implemented.
- Observe the earthwork process to document that subsurface conditions encountered during construction are consistent with the conditions anticipated in this report.
- Observe the subgrade conditions before placing structural materials.
- Observe the placement and compaction of all structural materials, and perform laboratory and field compaction testing.

CONSULTATION

Often during final design and/or construction, questions can arise or services are needed to complete the project. TBG offers various construction services such as pile logging, vibration monitoring, pile load tests, subgrade preparation testing, etc. At your request, TBG would be pleased to discuss these services.

LIMITATIONS

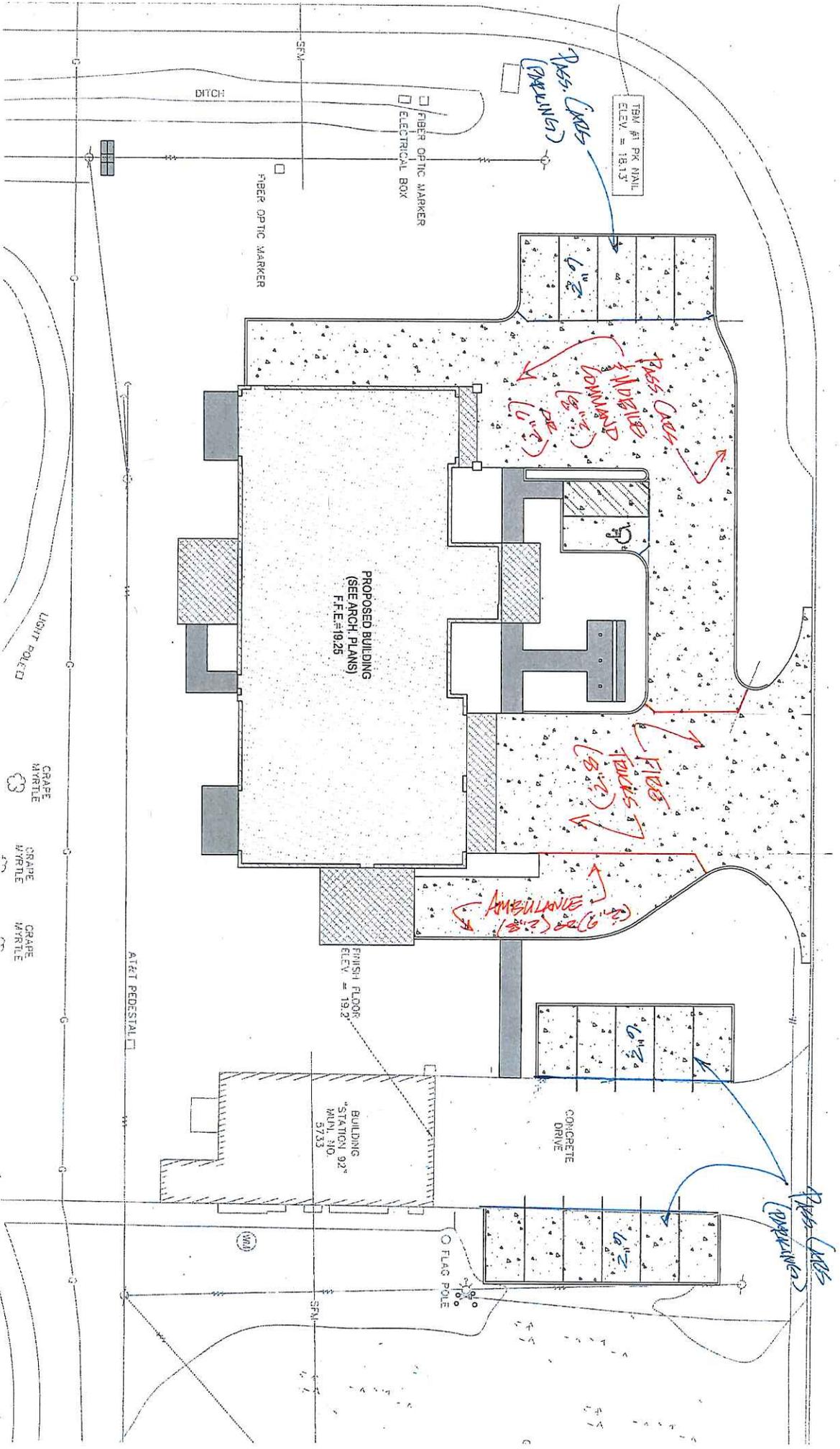
This report has been prepared for the exclusive use of St. John Parish Office of Fire Services and their assigns for specific application to the referenced property in accordance with generally accepted geotechnical engineering practices.

No other warranty, expressed or implied, is made. These recommendations do not reflect variations in subsurface conditions that may be intermediate of the boring locations or in unexplored areas of the site. Should such variations become apparent during construction, we reserve the right to re-evaluate our recommendations based upon on-site observations of the conditions.

In the event changes are made in the proposed construction plans, the recommendations presented in this report shall not be considered valid unless reviewed by our firm and modified or verified in writing.

Appendix

LA HIGHWAY 18
(FUEL) (ASPHALT)



0 10 20



BORING LOCATION PLAN 		BORING LOCATION	North 
<p>THE BETA GROUP, LLC. 1428½ Claire Ave, Gretna, Louisiana, 70053 504-227-2273 fax: 504-227-2274 Betagroupgc.com</p>		Client:	St. John Parish Office of Fire Services
		Project:	Proposed Public Safety Complex
		Location:	Wallace, Louisiana
		TBG Project No:	4988G
		Date:	8/10/18
		Scale: Not To Scale	Figure 1

Proposed St. John the Baptist Parish
Westbank Public Safety Complex
Hwy. LA-18
Wallace, LA

LOG OF SOIL BORING B-1



File: 4988G
Date: 7/19/18
Logged by: L. Adams
Driller: T. Roche
Rig: CME 75

St. John Parish Office of Fire Services
1801 West Airline Hwy.
Laplace, LA

Sheet 1 of 2

FIELD DATA				LABORATORY DATA							Soil Type	Location: Lat. 30° 2' 31.83" Long. 90° 40' 9.44"	
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits			Percent Passing #200 Sieve		Organic Content	Surface Elevation:
							LL	PL	PI				
			2.0 (P)	0.69	25	115							Medium Stiff Gray Silty Clay (CL) with Organics
			1.25 (P)	0.58	34	114							Soft to Medium Stiff Gray and Light Brown CLAY (CH) w/ Silt
	- 5		1.25 (P)	0.35	36	111	83	17	66				
			0.75 (P)	0.59	31	118							Soft to Medium Stiff Gray and Light Brown Silty Clay (CL)
	- 10		0.75 (P)	0.35	30	117							
			0.5 (P)	0.41	30	119							
	- 15												
			0.75 (P)	0.29	33	117	42	16	26				Soft Gray Silty Clay (CL)
	- 20												
			0.5 (P)	0.37	39	115							
	- 25												
			3 b/f 1-2-1		35					62			Soft to Medium Stiff Gray SANDY CLAY (CL)
	- 30												
			5 b/f 1-2-3		43								
	- 35												
			9 b/f 5-4-5		39					80			Stiff Gray SANDY CLAY (CL)
	- 40												

ARD LOG01 01R 4988G.GPJ LOG01R.GDT 9/14/18

Ground Water Level Data		Boring Advancement Method		Notes	
	Free water first encountered	4" Nom. Dia. Short Flight Auger: 0 to 15 ft.		Continued Next Page	
	Water level after 15 mins.	4" Dia. Rotary Wash: 15 to 70 ft.			
		Boring Abandonment Method			
Strata Boundaries May Not Be Exact					

Proposed St. John the Baptist Parish
Westbank Public Safety Complex
Hwy. LA-18
Wallace, LA

LOG OF SOIL BORING B-1



File: 4988G
Date: 7/19/18
Logged by: L. Adams
Driller: T. Roche
Rig: CME 75

St. John Parish Office of Fire Services
1801 West Airline Hwy.
Laplace, LA

Sheet 2 of 2

FIELD DATA				LABORATORY DATA							Soil Type	Location: Lat. 30° 2' 31.83" Long. 90° 40' 9.44"	
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits			Percent Passing #200 Sieve		Organic Content	Surface Elevation:
							LL	PL	PI				
													Stiff Gray SANDY CLAY (CL)
													Medium Dense to Dense Gray Silty Sand (SM)
	-45	X	16 b/f 3-7-9		37								
		X	21 b/f 9-9-12		23					10			
		X	27 b/f 10-15-12		23								
	-50												
	-55	X	24 b/f 18-12-12		20					9			
	-60	X	28 b/f 12-13-15		18								
	-65	X	42 b/f 13-19-23		17					6			
	-70	X	42 b/f 15-20-22		16								
	-75												
	-80												Boring completed at 70 ft.

ARD LOG01.01R 4988G.GPJ LOG01R.GDT 9/14/18

Ground Water Level Data		Boring Advancement Method	Notes
	Free water first encountered	4" Nom. Dia. Short Flight Auger: 0 to 15 ft.	
	Water level after 15 mins.	4" Dia. Rotary Wash: 15 to 70 ft.	
		Boring Abandonment Method	

Strata Boundaries May Not Be Exact

Proposed St. John the Baptist Parish
Westbank Public Safety Complex
Hwy. LA-18
Wallace, LA

LOG OF SOIL BORING B-2



File: 4988G
Date: 7/20/18
Logged by: L. Adams
Driller: T. Roche
Rig: CME 75

St. John Parish Office of Fire Services
1801 West Airline Hwy.
Laplace, LA

Sheet 1 of 2

FIELD DATA				LABORATORY DATA							Soil Type	Location: Lat. 30° 2' 31.29" Long. 90° 40' 10.16"	
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits			Percent Passing #200 Sieve		Organic Content	Surface Elevation:
							LL	PL	PI				
			5 b/f 3-2-3		22					68			Medium Stiff Dark Gray Silty Clay (CL) with Shells and Organics
			1.75 (P)	0.59	31	116							Medium Stiff Gray Silty Clay (CL) with Organics
	- 5		2.25 (P)	0.68	37	113							
▽			1.5 (P)	0.61	29	120	41	12	29				
	- 10		1.5 (P)	0.47	31	119							
▽			1.5 (P)	0.41	34	117	46	12	34				Soft to Medium Stiff Gray and Light Brown Silty Clay (CL)
	- 15												Very Soft Gray and Light Brown Silty Clay (CL)
	- 20		1.5 (P)	0.15	31	121							
	- 25		8 b/f 5-4-4		30					34			Loose Gray CLAYEY SAND (SC)
			9 b/f 5-4-5		29								
	- 30		12 b/f 4-5-7		31					54			Stiff to Very Stiff Gray SANDY CLAY (CL)
	- 35		18 b/f 8-11-7		25								
	- 40		8 b/f 3-4-4		39					68			Medium Stiff Gray SANDY CLAY (CL)

Continued Next Page

Ground Water Level Data		Boring Advancement Method		Notes
▽	Free water first encountered	4" Nom. Dia. Short Flight Auger: 0 to 15 ft.		
▽	Water level after 15 mins.	4" Dia. Rotary Wash: 15 to 70 ft.		
		Boring Abandonment Method		

Strata Boundaries May Not Be Exact

ARD LOG01 01R 4988G.GPJ LOG01R.GDT 9/14/18

Proposed St. John the Baptist Parish
Westbank Public Safety Complex
Hwy. LA-18
Wallace, LA

LOG OF SOIL BORING B-2



File: 4988G
Date: 7/20/18
Logged by: L. Adams
Driller: T. Roche
Rig: CME 75

St. John Parish Office of Fire Services
1801 West Airline Hwy.
Laplace, LA

Sheet 2 of 2

FIELD DATA			LABORATORY DATA							Soil Type	Location: Lat. 30° 2' 31.29" Long. 90° 40' 10.16"		
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits				Percent Passing #200 Sieve	Organic Content	Surface Elevation:
							LL	PL	PI				
													Medium Stiff Gray SANDY CLAY (CL)
													Medium Dense Gray Silty Sand (SM)
	-45	X	21 b/f 10-8-13		22								
	-50	X	18 b/f 7-8-10		21					15			
	-55	X	27 b/f 13-15-12		20								
	-60	X	22 b/f 11-10-12		17					10			
	-65	X	28 b/f 12-14-14		22								
	-70	X	30 b/f 13-14-16		19					6			
	-75												
	-80												
													Boring completed at 70 ft.

ARD LOG01 01R 4988G.GPJ LOG01R.GDT 9/14/18

Ground Water Level Data		Boring Advancement Method	Notes
	Free water first encountered	4" Nom. Dia. Short Flight Auger: 0 to 15 ft. 4" Dia. Rotary Wash: 15 to 70 ft.	
	Water level after 15 mins.		
		Boring Abandonment Method	

Strata Boundaries May Not Be Exact

Proposed St. John the Baptist Parish
Westbank Public Safety Complex
Hwy. LA-18
Wallace, LA

LOG OF SOIL BORING B-3



File: 4988G
Date: 7/23/18
Logged by: L. Admas
Driller: T. Roche
Rig: CME 75

St. John Parish Office of Fire Services
1801 West Airline Hwy.
Laplace, LA

Sheet 1 of 2

FIELD DATA			LABORATORY DATA							Soil Type	Location: Lat. 30° 2' 31.45" Long. 90° 40' 10.76"		
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits				Percent Passing #200 Sieve	Organic Content	Surface Elevation:
							LL	PL	PI				
			8 b/f 5-6-2		14					64			Medium Stiff Gray SANDY CLAY (CL) with Shells, Rocks, Organics, and Concrete
			5 b/f 2-2-3		27					79			Medium Stiff Gray Silty Clay (CL) with Shells, Rocks, and Organics
	5		1.75 (P)	0.55	38	110	81	19	62				Medium Stiff Gray and Light Brown Clay (CH) with Organics
			1.25 (P)	0.59	23	116							Soft to Medium Stiff Gray and Light Brown Silty Clay (CL) with Organics
			1.5 (P)	0.46	30	118							
	10												Very Soft to Soft Gray and Light Brown Silty Clay (CL)
			0.5 (P)	0.14	30	119	34	14	20				
			0.75 (P)	0.31	30	119							
			4 b/f 2-2-2		39								Medium Stiff Gray and Light Brown SILTY CLAY (CL)
			15 b/f 6-8-7		24					22			Medium Dense to Dense Gray Silty Sand (SM)
			21 b/f 8-11-10		26								
			21 b/f 10-10-11		31					26			

ARD LOG01.01R 4988G.GPJ LOG01R.GDT 9/14/18

Ground Water Level Data		Boring Advancement Method		Notes	
▽	Free water first encountered	4" Nom. Dia. Short Flight Auger: 0 to 15 ft.		Continued Next Page	
▽	Water level after 15 mins.	4" Dia. Rotary Wash: 15 to 70 ft.			
		Boring Abandonment Method			

Strata Boundaries May Not Be Exact

Proposed St. John the Baptist Parish
Westbank Public Safety Complex
Hwy. LA-18
Wallace, LA

LOG OF SOIL BORING B-3



File: 4988G
Date: 7/23/18
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St. John Parish Office of Fire Services
1801 West Airline Hwy.
Laplace, LA

Sheet 2 of 2

FIELD DATA				LABORATORY DATA							Location: Lat. 30° 2' 31.45" Long. 90° 40' 10.76"			
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits			Percent Passing #200 Sieve	Organic Content	Soil Type	Surface Elevation:	
							LL	PL	PI				Description	
			31 b/f 10-15-16		20							Medium Dense to Dense Gray Silty Sand (SM)		
			37 b/f 14-18-19		21					11				
	-45													
			32 b/f 11-15-17		21									
	-50													
			34 b/f 13-17-17		18					8				
	-55													
			31 b/f 10-15-16		20									
	-60													
			32 b/f 13-16-16		19					7				
	-65													
			37 b/f 16-18-19		20									
	-70													
													Boring completed at 70 ft.	
	-75													
	-80													

ARD LOG01 01R 4988G.GPJ LOG01R.GDT 9/14/18

Ground Water Level Data	Boring Advancement Method	Notes
Free water first encountered Water level after 15 mins.	4" Nom. Dia. Short Flight Auger: 0 to 15 ft. 4" Dia. Rotary Wash: 15 to 70 ft.	
	Boring Abandonment Method	

Strata Boundaries May Not Be Exact

DESCRIPTION OF TERMS AND SYMBOLS USED ON SOIL BORING LOG

FIELD DATA			LABORATORY DATA						Soil Type	DESCRIPTION		
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits				Other	
							LL	PL	PI			
	5											<div style="border: 1px solid black; padding: 5px;"> Description Classifications are based on visual observations by field & lab representatives as well as results of laboratory data (when available). </div>
	10											
	15											<div style="border: 1px solid black; padding: 5px; text-align: center;"> Laboratory Data </div> <div style="border: 1px solid black; padding: 5px;"> Compressive Strength Value based on peak compressive strength. Determined by unconfined compression test unless otherwise noted. </div> <div style="border: 1px solid black; padding: 5px;"> Dry Unit Weight As determined by method similar to ASTM D-2937. </div> <div style="border: 1px solid black; padding: 5px;"> Water Content As determined by pertinent portions of ASTM D-2216. </div> <div style="border: 1px solid black; padding: 5px;"> Atterberg Limits LL : Liquid Limit PL : Plastic Limit PI : Plasticity Index (= Liquid Limit - Plastic Limit) </div> <div style="border: 1px solid black; padding: 5px;"> Other Results of other tests such as consolidation, permeability, grain size or notes associated with testing program. </div>
	20											
	25											<div style="border: 1px solid black; padding: 5px;"> Soil Type Graphical representation of soil type. In accordance with USCS Symbols. </div>
	30											
	35											
	40											

Ground Water Levels

Long-Term Depth	
Depth to water after boring is completed (time noted).	
Short-Term Depth	
Depth to water after initial water encountered prior to proceeding with boring (time noted).	
Initially Encountered	
Depth where free water was initially encountered during augering.	

Sampling/Field Data

3.5 (P)	Undisturbed
3" dia. Tube sample	
Pocket Penetrometer (P)	
Penetration resistance (tons/sq. ft.).	
Torvane (T)	
Shearing resistance (tons/sq. ft.)	
13 b/f	Split Spoon
(3-7-6)	Std. penetration test
Std. Penetration	
No. of blows per foot (blows per each six inch increments).	
Auger	
Disturbed (auger) collected in accordance with ASTM D-1452.	
No Recovery	
Sampling attempted but no sample retrieved.	

Ground Water Level Data	Boring Advancement Method	Notes
	Boring Abandonment Method	

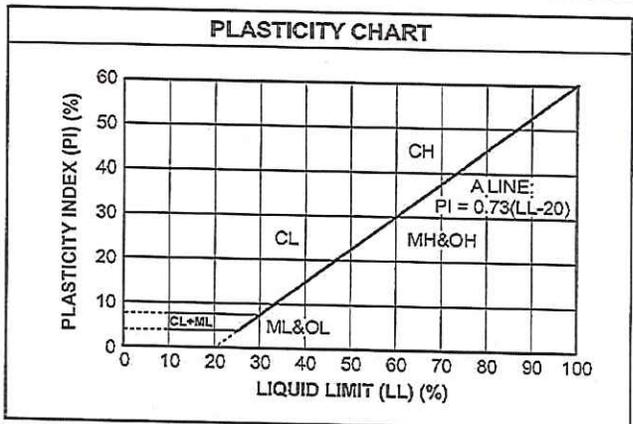
UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART		
COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	
	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	
	GM	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	
	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	
	SM	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)		
SILTS AND CLAYS Liquid limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA		
GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent GW, GP, SW, SP
 More than 12 percent GM, GC, SM, SC
 5 to 12 percent Borderline cases requiring dual symbols



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