ST. TAMMANY PARISH

MICHAEL B. COOPER
PARISH PRESIDENT

August 12, 2024

Please find the following addendum to the below mentioned BID.

Addendum No.: 1

Bid#: 24-32-2

Project Name: River Oaks New Elevated Water Tower

Bid Due Date: **September 4, 2024**

Receipt of this addendum shall be acknowledged by inserting its number and date in the space provided on the Proposal.

Bidders shall hold a Municipal and Public works, Steel Erection, OR Tower Construction Louisiana Contractor's License.

Davis – Bacon Act is NOT applicable to this project.

GENERAL INFORMATION:

1. Non-mandatory pre-bid was conducted on Thursday, August 1, 2024.
2. Permits
   - **a.** Contractor shall be required to apply for, meet all requirements and obtain all required permits. Permit information is included in Section 03, Para.V .
   - **b.** St. Tammany Parish Permit information is as follows:
     - **i.** Two permits are required, one sitework permit and one building permit. The Department of Utilities will prepare the permit application, and the Contractor will submit the permit application to the Parish. All fees will be paid by the Contractor.
     - **ii.** Contractor must register with St. Tammany Parish.
     - **iii.** Traffic and Drainage Impact Fees shall not apply.
     - **iv.** Permit fee schedule is available at http://www.stpgov.org/departments/permits-and-inspections
     - **v.** Other fees and costs shall be paid by Contractor
   - **c.** LDH authorization has been obtained by Owner.

d. Tammany Parish Dept. of Environmental Services Letter of No Objection will be obtained by Owner. (includes Engineering and Planning Dept. reviews).

3. **Bid due date is delayed to Wednesday, September 4, 2024**. Time and location remain the same. The inquiry deadline is Friday, August 23, 2024. The Addendum Deadline is Thursday August 29, 2024.

DRAWINGS:

1. Drawing Sheet E1:
   a. **Add** Drawing Sheet E1- "New Electrical Site Plan – River Oaks- Addendum No. 1".

SPECIFICATIONS

1. Section 03.
   a. **Add**: Para. V – "Operations Verbiage – Addendum No. 1"
2. Section 16050.
   a. **Add**: Specification Section 16050 – "Basic Electrical Materials and Methods – Addendum No. 1".
3. Section 16060.
   a. **Add**: Specification Section 16060 – "Grounding and Bonding – Addendum No.1".
4. Section 16120.
   a. **Add**: Specification Section 16120 – "Low Voltage Conductors – Addendum No. 1".
5. Section 16130.
   a. **Add** Specification Section 16130 – "Raceway Fittings Support – Addendum No. 1".

QUESTIONS AND ANSWERS

1. Question: When do you anticipate the demo of the hydropneumatic tank to take place? *Answer: The smaller hydropneumatic tank (Noted as Tank B on the plans) will be removed and delivered to a site designated by the Owner as part of this contract. The larger tank (noted as Tank A on the plans) will remain in operation throughout the duration of this contract. The larger tank will not be removed as part of this contract.*

2. Question: Is there any information on the existing tank? *Answer: The smaller tank is a 10,000-gallon hydropneumatic tank. The larger tank is a 20,000-gallon hydropneumatic tank.*

PRIOR APPROVAL REQUESTS

1. Reservoir Mixer – Specification Section 15120. Request to allow Kasco Marine, Inc. mixers to be considered as an equal to the specified Big Wave Water Technologies mixer. Request denied.
    a. The project specification does not allow oil filled motors. Kasco mixers use oil filled motors.
    b. The warranty offered for the Kasco mixer is one year free from defects in material and workmanship.
    c. The project specified mixer provides:
        i. Three (3) years on all parts
        ii. One full year labor
        iii. Lifetime Warranty on impeller
    d. The specified mixer motor control center comes equipped with a VFD. The Kasco control is direct drive.

ATTACHMENTS:

Plan Sheet E1- "New Electrical Site Plan – River Oaks- Addendum No. 1".

Specification Section 03, Para. V – "Operations Verbiage – Addendum No. 1".

Specification Section 16050 – "Basic Electrical Materials and Methods – Addendum No. 1".

Specification Section 16060 – "Grounding and Bonding – Addendum No.1".

Specification Section 16120 – "Low Voltage Conductors – Addendum No. 1".

Specification Section 16130 – "Raceway Fittings Support – Addendum No. 1".

<< End of Addendum 1 >>

ELECTRICAL LEGEND

LIGHTING

- SURFACE MOUNT LIGHT FIXTURE

SWITCHES

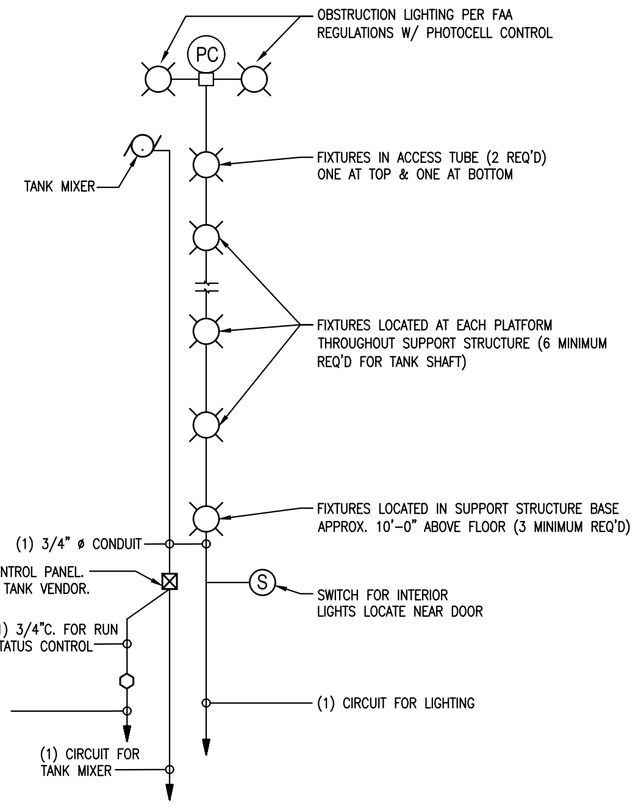
- $ — SINGLE POLE SWITCH – 20A, 120/277V, +48" AFF, UNLESS NOTED

SWITCHGEAR

- JUNCTION BOX
- EXISTING PANELBOARD TO REMAIN
- METER
- (xx) — MOTOR – HORSEPOWER NOTED
- SPECIAL ELECTRICAL CONNECTION

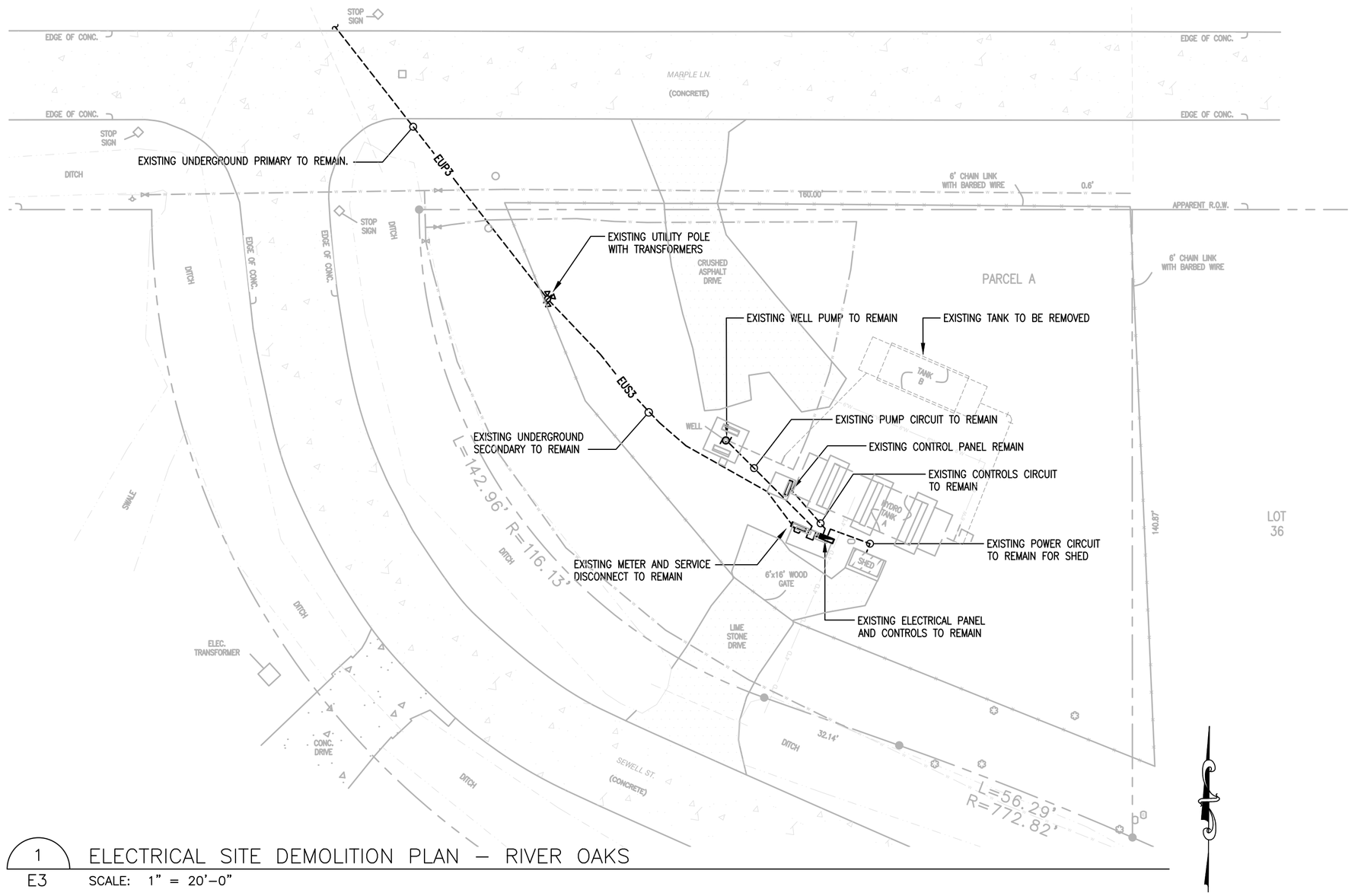
CONDUIT AND WIRE

- FLEXIBLE CONDUIT, SEALTITE AT WET LOCATIONS
- CONDUIT BELOW GRADE
- CONDUIT EXPOSED
- CIRCUIT CONDUCTORS IN CONDUIT
- MULTIPLE CIRCUIT CONDUCTORS IN CONDUIT WITH NEUTRALS
- GROUND CONDUCTORS IN CONDUIT
- XX–XX — CIRCUIT HOMERUN TO PANEL BOARD. XX–XX DENOTES PANEL NAME AND CIRCUIT NUMBER
- CONTINUATION OF CONDUIT RUN



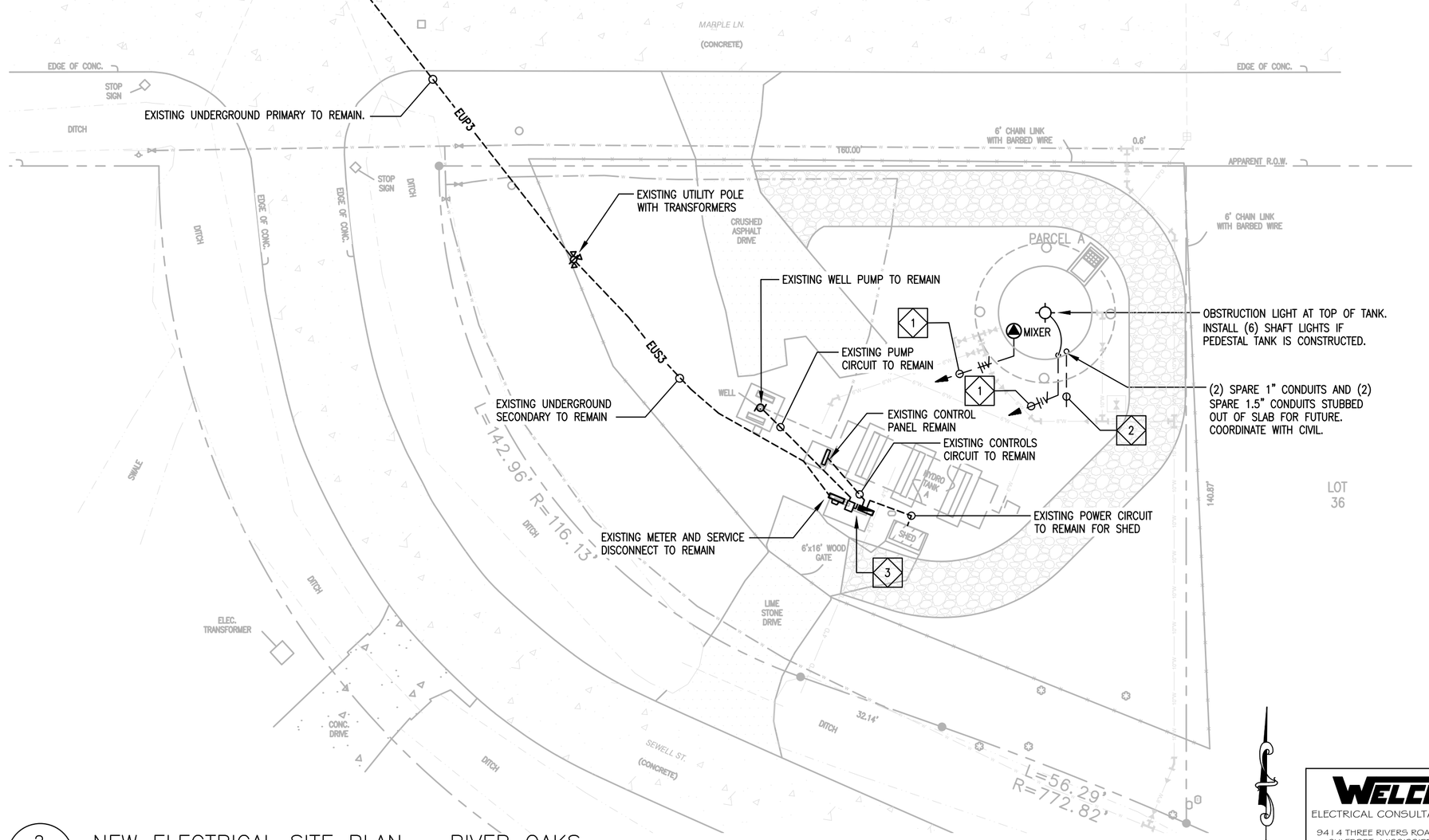
3 E1 ONE LINE DIAGRAM – ELEVATED TANK LIGHTS

SCALE: NOT TO SCALE



1 E3 ELECTRICAL SITE DEMOLITION PLAN – RIVER OAKS

SCALE: 1" = 20'–0"



2 E3 NEW ELECTRICAL SITE PLAN – RIVER OAKS

SCALE: 1" = 20'–0"

SPECIFIC ELECTRICAL NOTES:

1. 2–#10, 1–#10G. ROUTE TO EXISTING ELECTRICAL PANEL. INSTALL (1) NEW 20AMP/1–POLE BREAKER FOR LIGHTING AND (1) NEW 30AMP/1–POLE BREAKER FOR TANK MIXER. CONNECT CIRCUITS AT PANEL.
2. STUB OUT CONDUITS FOR FUTURE CONNECTION. COORDINATE WITH CIVIL AND OWNER FOR EXACT LOCATION OF STUB–OUTS.
3. MODIFY EXISTING ELECTRICAL PANEL AS REQUIRED FOR (1) NEW 20AMP/1–POLE BREAKER AND (1) NEW 30AMP/1–POLE BREAKER FOR CIRCUITS AS NOTED.

PRINCIPAL Engineering

WELCON
ELECTRICAL CONSULTANTS, PLLC
9414 THREE RIVERS ROAD, SUITE #4
GULFPORT, MISSISSIPPI 39503
228.822.8000
WEC PROJECT #: 23-PIE-03

ST. TAMMANY PARISH GOVERNMENT

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE:
.	.	.

DESIGNED BY:	JWH
DRAWN BY:	JWH
CHECKED BY:	GPW
SUBMITTED BY:	PRINCIPAL ENG.
PROJECT No.:	TU23000160
ISSUE DATE:	JULY 2024
APPROVED BY:	ANSI D
SHEET SIZE:	AS SHOWN
SCALE:	

STATE OF LOUISIANA
GREGORY PHYLLIS WELCK
License No. 39750
PROFESSIONAL ENGINEER
IN
ELECTRICAL ENGINEERING
7/26/24

RIVER OAKS
NEW ELEVATED STORAGE TANK
SLIDELL, LOUISIANA
PROJECT No.: TU23000160

NEW ELECTRICAL SITE PLAN
RIVER OAKS

SHEET NO.
E1
SHEET 14 OF 14

ADDENDUM NO. 1

Section 03 – Paragraph V

V. SPECIAL PROVISIONS

- SITE CONDITION
  - The location of the work of this contract is on the grounds of the River Oaks Water Well, located at 1004 Sewell Street, Slidell, LA 70461. The Contractor shall perform all his work in a way that minimizes interferences with the Parish's Department of Utility's (DU) operation of the facility and the public. All schedules and methods of work are subject to approval by the Engineer. It will be assumed that all prospective bidders have inspected the site(s) and have acquainted themselves with the local conditions.
  - Because of the location of the job site on the grounds of the River Oaks Water Well, it is imperative that the Contractor schedule and conduct his work in such a manner so as not to interfere in any way with the operation of the facility. Trucking through the facility, delivering and storing materials and equipment, shall be done with the approval of the engineer. The Contractor's personnel will be allowed to enter the facility and park private vehicles on site; however, he will be allowed to bring equipment and company vehicles only into the facility as necessary in the execution of this contract but may be required to remove them if their presence interferes with the operations of the Department of Utilities, all at the discretion of the Engineer.
  - All work of this contract MUST be coordinated with the Department of Utilities (DU) through the Engineer, with proper advanced notice.
  - The existing water well MUST remain operational throughout the length of this contract. Any outage of this facility and/or other damages due to the contractor's negligence shall be repaired immediately by the Contractor at no additional cost to the contract. Contractor shall inform the DU at least 72 hours in advance for any coordination required for tie-in the existing facility to the new facility, weather permitting. No work shall begin without express written approval of the DU. Waste water spillage, if any, shall be remediated immediately to the satisfaction of DU at no additional cost to the contract.

- BIDDERS TO EXAMINE LOCATION AND PLANS
  - Each Bidder shall make a personal examination of the location of the proposed work and of the surrounding area. He/she shall thoroughly acquaint themselves with the details of the work to be done and all the conditions and obstacles likely to be encountered, including soil conditions, in the performance and completion of work. Bidders shall inform themselves as to the facilities for the transportation, handling, and storage of equipment and materials.
  - Each bidder shall carefully study the plans, specifications and other contract documents and thoroughly satisfy themselves as to the conditions under which the work is to be

done, and as to the character, qualities and quantities of work to be performed, and materials to be furnished, and be prepared to execute a finished job in every particular.

- PARKING FACILITIES
  - The work under this contract is to be executed in close proximity of the adjacent residential neighborhood and businesses. The Contractor will be allowed to bring construction equipment and construction vehicles onto the site as necessary in the execution of this contract but may be required to relocate them if their presence interferes with the operations of the Board or businesses. All roadways must remain open throughout the entire construction period.

- UTILITY LOCATION
  - The locations of all utilities shown on the plans are approximate. Contractor shall field verify all utilities and their tie-in prior to any work commences.
  - Any damages to any utility line due to lack of the contractor's field verification shall be repaired immediately to the satisfaction of the Engineer, all at no cost to the contract.

- TIE-IN
  - The location and condition of each tie-in is approximate. It is the contractor's responsibility, as the first order of business to field verify the location and the conditions of each tie-in prior to ordering any materials and inform the Engineer of the findings.
  - Additionally, once the tie-ins are exposed, the contractor MUST notify the DU to operate and exercise the isolation valves at either end to see if they are operable and lines are flushed and cleaned (**ALL existing valves shall be operated by operations personnel of DU <u>only</u>**). In the event that the existing valves are not operable as determined by the Engineer, new valves may be installed at the discretion of DU through the Engineer.

- ENVIRONMENTAL REQUIREMENTS
  - The parties agree that the work and duties required to be performed in accordance with the Contract Documents shall meet and comply with all environmental requirements including the laws and regulations of the United States and the State of Louisiana.
  - For public areas that have come in contact with overflowed sewage, the Contractor will take reasonable action to implement disinfection procedures. Generally, these procedures will involve an application of an oxidizing agent such as a diluted chlorine solution on constructed surfaces (streets, driveways, walls, etc.) and a lime application on organic surfaces (lawns, soil areas, etc.). The level and extent of disinfection will be determined in the field. It is not the intent of this disinfection procedure to infer that total pathogen destruction has been achieved, nor that any other level of disinfection has been achieved.
  - The Contractor shall develop a plan to report, contain/by-pass and clean up all sewage spills or unanticipated hazards that would adversely affect the health of the community.

- REPORT: A report shall be given immediately to the DU Compliance Office (985-893-1717). The information communicated in the report must include location, nature of problem, name of project, name of company performing work, name of the individual making the call, time of incident, volume of spill (gallons), method of remediation and clean up, and other pertinent data as necessary.

- NOISE and SOUND ISSUE
  - Contractor's attention shall be given specifically to St. Tammany Parish Ordinance, Article IV – Noise and Sound, which in part states that the sound measured by a performer taken at least 25 feet from the source of the noise cannot exceed 70 decibels between Noon and 9 p.m. Between 9 p.m. and Noon, the sound measurement taken at least 25 feet from the source of the noise cannot exceed 55 decibels.

- NIGHT, WEEKEND OR HOLIDAY WORK
  - Normal work hours are 7:00 a.m. to 6:00 p.m. Monday through Friday. Hours requested outside normal work hours should be requested in writing at least 72 hours in advance. Contractor shall be required to pay resident inspection fees for work outside normal working hours. Night, weekend or holiday work requiring the presence of an Engineer or inspector will be permitted only in cases of emergency, and then only to such an extent as is absolutely necessary and with the written permission of the DU through the Engineer. In the event such work becomes necessary, no extra payment will be made therefor.

- LONG LEAD ITEMS
  - Due to long delivery of certain items specified in this contract work, it is strongly recommended that the Contractor to order those long delivery items as soon as NTP has been issued. Contract substantial completion date shall not be extended due to contractor's negligence in ordering material and/or equipment in timely manner.

- DELIVERY & UNLOADING
  - Seventy-two (72) hours advanced notice of arrival must be rendered by notifying the Engineer (Tel: 985 893-1717) so that unloading may be arranged without inconvenience to either the Parish or the carrier. Arrangements shall be made for delivery before noon on a regular workday. Deliveries attempted without proper advance notice or on other than flatbed trucks will be refused and any additional storage or delivery charges shall be the responsibility of the Contractor. All freight and insurance charges shall be included in the Bid Price. Risk of loss due to damage of any kind shall be borne by the Contractor until receipt and unloading by the Parish.
  - All components shall be adequately secured and bolted or otherwise made fast to prevent movement and/or damages during shipment
  - Special notice is hereby given to all Contractors that the terms stipulated in this section will be strictly interpreted and rigidly enforced.
  - All openings shall be completely covered and protected for shipment.

- AS-BUILT DRAWINGS
  - The Contractor shall furnish one (1) neat and legibly marked blue line set of contract drawings to depict actual "as-built" conditions.
  - The "as-built" drawings shall show all construction, elevation, equipment, mechanical and electrical systems and connections as installed or built.
  - The work under this contract will not be considered "complete" until "as-built" drawings, prepared to the satisfaction of the Engineer, are received.
  - There will be no direct payment for furnishing the "as-built" drawings specified above.
  - Provide copies of operation and maintenance manuals for all equipment. Manuals shall include spare parts lists recommended by the manufacturer.

- JOB SITE DRAWINGS AND SPECIFICATIONS
  - A complete and current set of contract drawings and specifications (including any addenda) shall be maintained on the job site by the Contractor.
  - One copy of all approved shop drawings, equipment or material drawings, etc. shall be maintained on the job site by the Contractor.

- EMERGENCY TELEPHONE
  - The Contractor shall, before contract work begins, furnish to the Engineer Telephone Numbers at which company officers and/or responsible persons can be contacted at night, weekends and holidays in case of emergencies.

- CONFLICT BETWEEN DRAWINGS AND SPECIFICATIONS
  - In case of the conflict between the drawings and the specifications, the Engineer shall be the sole authority in determining which of the two shall take precedence in the Contract Documents. Such conflict shall not be a basis for an extra expense to the Parish.
  - The Contractor is hereby cautioned to base his/her price and work upon the more costly item in event of conflict as no claim for extra expense will be entertained on this basis.
- Permits
  - Contractor shall be required to apply for, meet all requirements and obtain all required permits.
  - St. Tammany Parish Permit information is as follows:
    - Two permits are required, one sitework permit and one building permit. The Department of Utilities will prepare the permit application, and the Contractor will submit the permit application to the Parish. All fees shall be paid by the Contractor.
    - Contractor must register with St. Tammany Parish.
    - Traffic and Drainage Impact Fees shall not apply.
    - Permit fee schedule is available at: http://www.stpgov.org/departments/permits-and-inspections
    - Other fees and costs shall be paid by Contractor

- LDH authorization has been obtained by Owner.
- St. Tammany Parish Dept. of Environmental Services Letter of No Objection will be obtained by Owner. (Includes Engineering and Planning Dept. reviews)

SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

Addendum No. 1

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of Division 01 apply to this section

B. Section Includes:

1. Boxes, enclosures, keys and locks.
2. Identifications and signs.

C. Related Sections:

1. Section 16010: Basic Electrical Requirements.

PART 2 - PRODUCTS

2.01 BOXES, ENCLOSURES, KEYS AND LOCKS

A. Outlet Boxes and Fittings:

1. Junction boxes installed in concealed Work shall be galvanized steel, pressed, or welded type, with knockouts.
2. In exposed Work, where conduit runs change direction or size, outlet boxes and conduit fittings shall be cast metal with threaded hubs cast integral with box or fitting.
3. Fittings shall be cast metal and non-corrosive. Ferrous metal fittings shall be cadmium-plated or zinc galvanized. Castings shall be true to pattern, smooth, straight, with even edges and corners, of uniform thickness of metal, and shall be free of defects.
4. Covers for fittings shall be galvanized steel or non-corrosive aluminum and shall be designed for particular fitting installed.
5. Junction boxes shall be minimum, 4-inch square, 2-1/8 inches deep, depending upon number of conductors or conduits therein.
6. Factory made knockout seals shall be installed to seal box knockouts, which are not intact.
7. Where flexible conduit is extended from flush outlet boxes, provide and install weatherproof universal box extension adapters.

B. Junction and Pull boxes:

1. Junction and pull boxes, in addition to those indicated, shall only be used in compliance with codes, recognized standards, and Contract Documents.
2. Interior and non-weatherproof boxes shall be constructed of blue or galvanized steel with ample laps, spot welded, and shall be rigid under torsion and deflecting forces. Boxes shall be furnished with auxiliary angle iron framing where necessary to ensure rigidity.
3. Covers shall be fastened to box with a sufficient number of brass machine screws to ensure continuous contact all around. Flush type boxes shall be drilled and tapped for cover screws if boxes are not installed plumb. Surfaces of pull

and junction boxes and covers shall be labeled in black marker ink designating system, panelboard and circuit designation contained in box. In exposed Work, designation shall be installed on inside of pull box or junction box cover.

4. Weatherproof NEMA 3R pull and junction boxes shall conform to foregoing for interior boxes with following modifications:

   a. Cover of flush mounting boxes shall be furnished with a weather-tight gasket cemented to, and trimmed even with, cover all around.

   b. Surface or semi-flush mounting pull and junction boxes shall be UL, or another Nationally Recognized Testing Laboratory (NRTL) listed as rain-tight and shall be furnished complete with threaded conduit hubs.

   c. Exposed portions of boxes shall be galvanized and finished with one prime coat and one coat of baked-on gray enamel, unless already furnished with factory baked-on finish.

5. Junction and pull boxes shall be rigidly fastened to structure and shall not depend on conduits for support.

6. Polymer Concrete Boxes (if required):

   a. Polymer concrete boxes are to be made from aggregates in combination with polymer resin, combined and processed by mixing, molding, and curing, and reinforced with fiberglass.

   b. Boxes are to be high strength, impact resistant, corrosion resistant, nonflammable, and noncorrosive.

   c. Enclosures, boxes and covers are required to conform to all test provisions of the most current ANSI/SCTE 77 “Specification For Underground Enclosure Integrity”

   d. All components in an assembly (box & cover) are manufactured using matched surface tooling.

   e. Covers shall be marked as electrical, power, communications, fiber, signal, etc. as required.

   f. Bottom of box shall be filled with 6" of pea gravel.

C. Keys and Locks:

1. Provide 2 keys with furnished door locks, including cabinet door locks for all enclosures.

2.02 IDENTIFICATION AND SIGNS

A. Identification Plates:

1. Provide identification plates for the following unless otherwise specified, for control panels, push-button stations, time switches, contactors, disconnect switches, motor starters, motor switches, terminal cabinets.

2. Identification plates shall be of plastic stock and shall adequately describe function, voltage and phase of identified equipment. Where identification plates are detailed or described on Drawings, inscription and size of letters shall be as indicated. Identification plates shall indicate panel designation, voltage, and phase of equipment. For terminal cabinets, identification plates shall indicate system contained in terminal cabinet.

3. Identification plates shall be black-and-white nameplate stock of bakelite with characters cut through black exposing white. Plates shall be furnished with beveled edges and shall be securely fastened in place with No. 4 Phillips-head, cadmium-plated steel, self-tapping screws. Characters shall be 3/16 inch high, unless otherwise indicated.

B. Markings:

1. Install identification markings to surface-mounted starters, switches, and other devices controlling motors and appliances. Provide abbreviations required along with an identifying number. Markings to be provided with locking type stencils using paint of a contrasting color. Figures shall be 3/8 inch high unless otherwise indicated. Self-sticking plastic labels, with embossed characters made with a typewriter may be installed instead of stencils and paint; self adhesive plastic, or self sticking laminated plastic labels may be installed.

PART 3 - EXECUTION

3.01 INSTALLATION AND SUPPORT OF BOXES

A. Install boxes plumb and securely fastened to structure, independent of conduit.

3.02 IDENTIFICATION OF CIRCUITS AND EQUIPMENT

A. Provide descriptive nameplates or tags permanently attached to circuit breakers, disconnect switches, starters, pushbutton control stations and other apparatus installed for operation or control of circuits.

B. Provide nameplates of engraved laminated plastic, or etched metal. Submit Shop Drawings denoting dimensions and format to engineer before installation. Fasten to equipment with escutcheon pins, rivets, self-tapping screws, or machine screws. Self-adhering or adhesive backed nameplates are not permitted.

C. Fasten tags to feeder wiring in conduits at every point where runs are broken or terminated, including pull wires in empty conduits. Indicate circuit, phase, and function. Tag branch circuits in panel boards and motor control centers. Tags may be manufactured of pressure-sensitive plastic or embossed self-attached stainless steel or brass ribbon.

D. Provide circuit identification cards and cardholders in all control enclosures. Cardholders shall consist of metal frame retaining a clear plastic cover permanently attached to inside of panel door. List of circuits shall be typewritten on a card. Circuit description shall include name or number of circuit, area and connected load.

3.03 PROTECTION

A. Protect Work of this section until Substantial Completion.

3.04 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off Project site.

END OF SECTION

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SECTION 16060 - GROUNDING AND BONDING

Addendum No. 1

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of Division 01 apply to this section

B. Section Includes: Provide and install grounding system as indicated or required.

C. Related Sections:

1. Refer to related sections for their system grounding requirements.
2. Section 16010: Basic Electrical Requirements.

1.02 QUALITY ASSURANCE

A. Reference Standards:

1. IEEE 142 Green Book.
2. Underwriter's Laboratories (UL).
3. National Electrical Code.
4. Building Industry Consultant Services International (BICSI) (Signal).
5. EIA/TIA (Signal and power).
6. Nationally Recognized Testing Laboratory (NRTL) or equal.

1.03 SYSTEM DESCRIPTION

A. Metallic objects on the Project site that enclose electrical conductors, or that are likely to be energized by electrical currents, shall be effectively grounded.

B. Metal equipment parts, such as enclosures, raceways, and equipment grounding conductors, and earth grounding electrodes shall be solidly joined together into a continuous electrically conductive system.

C. Metallic systems shall be effectively bonded to the main grounding electrode system.

D. A separately derived AC source shall be grounded to the equipment grounding conductor, and to separate “made” electrode of building grounding electrode system.

E. Electrical continuity to ground metal raceways and enclosures, isolated from equipment ground by installation of non-metallic conduit or fittings, shall be provided by a green insulated grounding conductor of required size within each raceway connected to isolated metallic raceways, or enclosures at each end. Each flexible conduit over 6 feet in length shall be provided with a green insulated grounding conductor of required size.

F. Cold water, or other utility piping systems, shall not be utilized as grounding electrodes due to the installation of insulating couplings and non-metallic pipe in such installations.

G. Non-current carrying metal parts of enclosures, motor frames, equipment cabinets, and metal frames of buildings shall be permanently and effectively grounded. Provide a NEC sized grounding conductor in every raceway.

H. Neutral of service conductors shall be grounded as follows:

1. Neutral shall be grounded at only one point within the Project site for that particular service. Preferable location of grounding point shall be at the service equipment or panelboard, or main switch.

2. Equipment and conduit grounding conductors shall be bonded to that grounding point.

1.04 SUBMITTALS

A. None.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Electrodes shall be copper-clad steel ground rods, minimum ¾-inch diameter by 10 feet long.

B. Grounding conductors shall be copper, #12 minimum with green insulation, unless noted otherwise.

C. Ground tails shall be copper, #12 minimum with green insulation, installed in all metallic junction boxes where devices are being installed. Branch circuit ground, junction box, and devices shall be bonded at each junction box.

PART 3 - EXECUTION

3.01 INSTALLATION

A. All grounding shall be installed in accordance with details on drawings and per NEC 250.

B. Bond all electrical boxes and enclosures.

C. All conduits shall have a grounding conductor, minimum #12 copper. Conductor size shall be increased based on ampacity and/or phase conductors of the circuit.

D. Install grounding conductors at each electrical location as noted on drawings.

E. Grounding electrodes shall be installed in the nearest suitable planting area, where not otherwise indicated on Drawings.

F. Grounding electrode conductors shall be installed in conduit from the service disconnecting means and extended to the connection point of the grounding electrode.

G. Grounding rods shall be driven to a depth of not less than 10 feet. If necessary, permanent ground enhancement material, as manufactured by Erico Electrical Products, or equal, shall be installed at each ground rod to improve grounding effectiveness. Install in accordance with manufacture's installation instructions.

H. Grounding electrodes shall provide a resistance to ground of not more than 25 ohms.

I. When installing grounding rods, if resistance to ground exceeds 25 ohms, 2 or more rods connected in parallel, or coupled together shall be provided to meet grounding resistance requirements.

J. Parallel grounding rods shall be connected together with recognized fittings and grounding conductors in galvanized rigid steel conduit, buried not less than 12 inches below finish grade.

3.02 TESTING

A. Test grounding resistance of electrodes, ground rods, bonding of building steel, water pipes, gas pipes and other utility piping. Tests shall be performed as follows:

1. Visually and mechanically examine ground system connections for completeness and adequacy.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.04 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

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SECTION 16120 - LOW-VOLTAGE CONDUCTORS (600 VOLT AC)

Addendum No. 1

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of Division 01 apply to this section

B. Section Includes: Low-voltage wire, splices, terminations and installation.

1.02 SUBMITTALS

A. None.

PART 2 - PRODUCTS

2.01 WIRES

A. Wires shall be single conductor type THHN or THWN insulated with polyvinyl chloride and covered with a protective sheath of nylon, rated at 600 volts. Wires may be operated at 90 degrees C. maximum continuous conductor temperature in dry locations, and 75 degrees C. in wet locations and shall be listed by UL Standard 83 for thermoplastic insulated wires, listed by Underwriter's Laboratories (UL) for installation in accordance with Article 310 of the National Electrical Code (NEC). Conductors shall be solid or stranded copper for 12 AWG and smaller conductors, and stranded copper for 10 AWG and larger conductors. Conductors shall be insulated with PVC and sheathed with nylon. Wires shall be identified by surface markings indicating manufacturer's identification, conductor size and metal, voltage rating, UL symbol, type designations and optional rating. Indentations for lettering is not permitted. Wires shall be tested in accordance with the requirements of UL standard for types THWN, or THHN.

B. Conductors shall be solid Class B or stranded Class C, annealed uncoated copper in accordance with UL standards, or another Nationally Recognized Testing Laboratory (NRTL).

2.02 STANDARDS

A. THWN/THHN wires shall comply with the following standards:

1. UL 83 for thermoplastic insulated wires.

2. UL 1063 for machine tool wires and cables.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Wires shall not be installed until debris and moisture is removed from conduits, boxes, and cabinets. Wires stored at site shall be protected from physical damage until they are installed and walls are completed.

B. Wire-pulling compounds furnished as lubricants for installation of conductors in raceways shall be compounds approved and listed by UL, NRTL, or equal. Oil, grease,

graphite, or similar substances are not permitted. Any runs shorter than 50 feet are exempt. When pulling conductors, do not exceed manufacturer's recommended values

C. Pressure cable connectors, pre-insulated Scotchlok, 3M, or equal, Y, R or B spring-loaded twist-on type, may be furnished in splicing number 8 AWG or smaller wires for wiring systems; except public address and telephone systems.

D. Connections to any bussing and high-press cable connectors shall be securely bolted together with corrosion-resistant plated carbon steel, minimum grade 5 machine screws secured with constant pressure-type locking devices.

E. Connection of any bonding or grounding conductors shall be securely bolted together with corrosion-resistant plated carbon steel, minimum grade 5 machine screws secured with constant pressure-type locking devices.

F. Wiring in panel cabinets, pull boxes, and other cabinets, shall be neatly grouped and tied in bundles with nylon ties at 10-inch intervals. In enclosures and terminal blocks, wires shall be fanned out to terminals. If bundles are longer than 24 inches, a maximum of 9 current carrying conductors may be bundled together.

G. Install conductor lengths with a minimum length within the wiring space. Conductors must be long enough to reach the terminal location in a manner that avoids strain on the connecting lug.

H. Maintain the conductor required bending radius.

I. Wiring systems shall be free from short circuits and grounds, other than required grounds.

3.02 COLOR CODES

A. General Wiring:

1. Color code conductor insulation as follows:

SYSTEM VOLTAGE		
Conductor	120/240V	480V
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	N/A	Yellow
Neutral	White	

2. For phase and neutral conductors 6 gauge or larger, permanent plastic-colored tape may be furnished to mark conductor end instead of coded insulation. Tape shall cover not less than 2 inches of conductor insulation within enclosure.

3.03 WIRING IDENTIFICATION

A. All wiring and cables shall be identified at each point the conduit run is broken by a cabinet, box, gutter, etc. Provide Brady markers, or equal to designate circuit number.

3.04 TAPE AND SPLICE KITS

A. Splices, joints, and connectors joining conductors in dry and wet locations shall be covered with insulation equivalent to that provided on conductors. Free ends of conductors connected to energized sources shall be taped. Voids in irregular connectors shall be filled with insulating compound before taping. Thermoplastic insulating tape approved by UL, NRTL, or equal for installation as sole insulation of splices shall be furnished and shall be installed according to manufacturer's printed specifications.

3.05 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.06 CLEANUP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION

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SECTION 16130 - RACEWAYS, FITTINGS, AND SUPPORTS

Addendum No. 1

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of Division 01 apply to this section

B. Section Includes:

1. Raceways and wire ways
2. Conduit installation.
3. Underground requirements.

C. Related Sections:

1. Section 16010: Basic Electrical Requirements.
2. Section 16050: Basic Electrical Materials and Methods

D. Applicable Standards and Codes

1. EIA/TIA 569 Standards.
2. National American Standards Institute (ANSI)
3. National Electrical Manufacturer's Association (NEMA)
4. Nationally Recognized Testing Laboratory (NRTL)
5. National Electrical Code (NEC)
6. Underwriters Laboratory (UL)

1.02 SUBMITTALS

A. None.

PART 2 - PRODUCTS

2.01 RACEWAYS

A. Conduit Materials:

1. Metallic conduit, and tubing shall be manufactured under the supervision of an UL, or another NRTL factory inspection and label service program. Each 10-foot length of conduit and tubing shall bear the UL or another NRTL label and manufacturer's name.
2. Rigid metallic conduit shall be rigid steel, heavy wall, mild steel, zinc-coated, with an inside and outside protective coating manufactured in accordance with ANSI C 80.1. Couplings, elbows, bends, condulets, bushings and other fittings shall be the same materials and finish as the rigid metallic conduit. Fittings, connectors, and couplings shall be threaded type, manufactured in accordance with ANSI C 80.1 and UL 6.

3. Rigid aluminum conduit shall be corrosion resistant aluminum and manufactured of 6063 alloy in temper designation T-1. It shall be manufactured in accordance with ANSI C80.5. All fittings shall be of the same materials and finish as the aluminum conduit.

4. Flexible metallic conduit shall be of flexible interlocking strip construction with continuous zinc coating on strips, manufactured in accordance with UL 1.

   a. Connectors and couplings shall be required fittings of the type, which threads into convolutions of flexible conduit.

   b. Nonmetallic flexible conduit is not allowed.

5. Liquid-tight flexible metal conduit shall be galvanized heavy wall, flexible locked metallic strip construction, UV rated, with smooth moisture and oil-proof, abrasion-resistant, extruded plastic jacket. Connectors shall be as required for installation with liquid-tight flexible conduit and shall be installed to provide a liquid-tight connection.

6. Non-metallic conduit shall be rigid PVC electrical conduit extruded to schedule 40 dimensions of Type II. Grade 1 high impact, polyvinyl chloride, sweeps, couplings, reducers and terminating fittings shall be listed under the UL, or another NRTL, and shall bear the manufacturer's listed marking.

7. Conduit size shall be 1/2" minimum for above grade installations and 3/4" minimum for below grade or in-slab installations.

8. Metal Clad (MC) cable system is not allowed.

B. Sleeves for Conduits: Sleeves shall be adjustable type, of 26 gage galvanized iron, Adjust-to Crete Co. Adjust-to-Crete, or Jet Line Products Inc. Jet-Line, or equal.

C. Where conduit enters a building through a concrete foundation below grade, or ground water level, or where it is necessary to seal around a conduit where it passes through a concrete floor or wall, provide O-Z/Gedney Type FSK Thru Wall and Floor Seal, or equal.

D. Wireways shall be 16 gage galvanized steel enclosed hinge/screw wiring troughs, surface metal raceway, wireway, and auxiliary gutter designed to enclose electrical wiring. Wireway fittings shall be furnished with removable covers and sides to permit complete installation of conductors throughout the entire wireway run. Cover shall be furnished with keyhole slots to accept captive screws locking the cover securely closed. Wireways shall be UL or another NRTL listed, and shall be Square D Type LDG NEMA-1 enclosure for interior applications, or Type RD NEMA-3R enclosure for exterior applications, or equal by Cooper B-line, Hoffman, Wire Guard, or Circle AW.

E. Pull Wires: Install 1/8 inch polypropylene cords in empty or spare conduits.

PART 3 - EXECUTION

3.01 CONDUIT INSTALLATION

A. General Requirements:

1. Provide complete and continuous systems of rigid metallic conduit, outlet boxes, junction boxes, fittings and cabinets for systems of electrical wiring including lighting, power, and signal systems, except as otherwise specified.

2. Exposed conduits or conduits in shaft, shall be rigid galvanized or rigid aluminum.

3. EMT conduit is not allowed for this project.

4. Flexible metallic conduit shall be installed for final connection of motor terminal boxes, shop equipment, mechanical equipment, and other equipment, or for frequent interchange, and shall be of sufficient length, not exceeding 36 inches, to permit full travel or adjustment of motor on its base. Flexible metallic conduit shall not be used for equipment not requiring adjustment or frequent interchange.

5. Liquid-tight flexible metallic conduit shall be installed at exterior locations or where subject to liquid or oil exposure, except where otherwise specified, for final connection of equipment and as listed above.

6. Connectors for flexible metal conduit and liquid-tight flexible metallic conduit shall be compatible with the conduit, and of the types which threads into convolutions of conduit. Connectors for watertight flexible metal conduit shall be as required for installation and shall be installed to provide a watertight connection.

7. Exposed conduit shall be installed vertically and horizontally following the general configuration of the structure.

8. Underground feeder distribution conduits for systems may be non-metallic conduit instead of rigid conduit except where otherwise specified or indicated.

9. Conduit shall be concealed unless otherwise indicated. Conduits exposed to view shall be installed parallel or at right angles to structural members.

10. Bends or offsets will not be permitted unless absolutely necessary. Radius of each conduit bend or offset shall be as required by ordinance. Bends and offsets shall be performed with standard industry tools and equipment or may be factory fabricated bends or elbows complying with requirements for radius of bend specified. Heating of metallic conduit to facilitate bending is not permitted. Refer to underground installation, specified in this section, for radius of bends and offsets required for underground installations.

11. Running threads are not permitted. Provide conduit unions where union joints are necessary. Conduit shall be maintained at least 6 inches from covering of hot water and steam pipes and 18 inches from flues and breechings. Open ends of conduits shall be sealed with permitted conduit seals during construction of buildings and during installation of underground systems.

12. Where conduits are terminated in groups at panelboards, and cabinets, etc., provide templates or spacers to fasten conduits in proper position and to preserve alignment.

13. Conduits shall be supported as required by code, but not to exceed 10 feet. Where applicable, conduit needs to be rigidly supported every 5 feet and supported within 3 feet of every junction box.

14. Where auxiliary supports, saddles, brackets, etc., are required to meet special conditions, they shall be fastened rigid and secure before conduit is attached.

15. Pipe hangers for individual conduits shall be factory fabricated. Steel rods shall be 3/8 inch for 2-inch conduit hangers and smaller and shall be 1/2 inch for 2-1/2 inch conduit hangers and larger.

16. Factory fabricated pipe straps shall be one or 2-hole formed galvanized clamps, heavy-duty type, except where otherwise specified.

17. One inch and smaller exposed conduits shall be fastened with one-hole malleable iron straps. Perforated straps and plumber's tape is not permitted for the support of conduits. Do not fasten or support conduits with "tie-wire".

18. Bushings and locknuts for rigid steel conduit shall be steel threaded insulating type. Setscrew bushings are not permitted.

19. Flex conduits shall be cut square and not at an angle.

20. Routing of conduits may be changed providing length of any conduit run is not increased more than 10 percent of the length indicated on Drawings.

B. Underground Requirements:

1. Underground conduits and raceways shall be buried to a depth of not less than 24 inches below finished grade to top of the conduit envelope, unless otherwise specified.

2. Assemble sections of conduit with required fittings. Cut ends of conduit shall be reamed to remove rough edges. Joints in conduits shall be provided liquid-tight. Bends at risers shall be completely below surface where possible.

3. The architect or engineer will observe underground installations before and during conduit placement. A mandrel shall be drawn through each run of conduit in presence of the architect or engineer before and after placement. Mandrel shall be 6 inches in length minimum, and have a diameter that is within 1/4 inches of diameter of conduit to be tested.

4. Non-metallic conduit installations shall comply with following additional requirements. Joints in PVC conduit shall be sealed by means of required solvent-weld cement supplied by conduit manufacturer. Non-metallic conduit bends and deflections shall comply with requirements of applicable electrical code, except that minimum radius of any bend or offset for conduits sized from 1/2 inch to 1-1/2 inches inclusive shall not be less than 24 inches. Bends at risers and risers shall be galvanized, rigid steel conduit. Conduits below slab shall be painted with epoxy, resin paint.

5. All below grade non-metallic conduits shall have galvanized, rigid steel 90’s painted epoxy, resin paint.

6. Furnish and install a 6-inch wide, polyethylene, red underground barrier type 12 inches above full length of conduits reading, "CAUTION ELECTRIC LINE BURIED BELOW".

7. Underground conduit systems provided for utility companies shall be furnished to meet the requirements of the utility companies requiring service.

8. Protect inside of conduit and raceway from dirt and rubbish during construction by capping openings.

9. Add bell-end bushings for conduit stub-up including underground entries to pull boxes, and manholes. Under floor standing switchboards and motor control centers provide a 4” galvanized nipple with ground bushing.

10. Underground conduit for systems operating above 600 volts shall be a minimum size of 4 inches.

11. All underground conduits and raceways shall be swabbed prior to wire pull.

3.02 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.03 CLEANUP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION

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