AIA® Document G710™ – 2017

Architect's Supplemental Instructions

PROJECT: *(name and address)* 21-08.21 Cherokee Nation Replacement Hospital	**CONTRACT INFORMATION:** Contract For: General Construction Date:	**ASI INFORMATION:** ASI Number: ASI 01 Date: 10-24-2022
OWNER: *(name and address)* Cherokee Nation Health Services 19600 E. Ross Street Tahlequah, OK 74464	**ARCHITECT:** *(name and address)* James R. Childers Architect, Inc. 45 S. 4th Street Fort Smith, AR 72901	**CONTRACTOR:** *(name and address)* Foreman | Manhattan Construction Team 5601 S. 122nd E. Ave. Tulsa, OK 74146

The Contractor shall carry out the Work in accordance with the following supplemental instructions without change in Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates your acknowledgment that there will be no change in the Contract Sum or Contract Time.
(Insert a detailed description of the Architect's supplemental instructions and, if applicable, attach or reference specific exhibits.)

Drawings

C4-201 - LREC Relocation Plan and Profile - New sheet added for LREC relocation

Specifications

26 27 26 -Wiring devices - new section
26 56 13 - Lighting Poles and Stanrdardss -New Section
26 56 19 - LED Exterior Lighting - New Section
31 23 00 - Exacvation and Fill - Revised page 7 per direction from CN regarding excavation

ISSUED BY THE ARCHITECT:

James R. Childers Architect, Inc.
ARCHITECT *(Firm name)*

J. Breck Childers
SIGNATURE

J. Breck Childers, Managing Principal
PRINTED NAME AND TITLE

10-24-2022
DATE

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SECTION 26 2726

WIRING DEVICES

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.

B. Section 01 8113 – Sustainable Design Requirements: Action and informational submittals
   1. This project is pursuing LEED Healthcare v4: Silver Certification
   2. Refer to this section for additional, required LEED submittals not included in this specification section

1.2 SUMMARY

A. Section Includes:

   1. Standard-grade receptacles, 125 V, 20 A.
   2. USB receptacles.
   3. GFCI receptacles, 125 V, 20 A.
   4. SPD receptacles, 125 V, 20 A.
   5. Hospital-grade receptacles, 125 V, 20 A.
   6. Twist-locking receptacles.
   7. Pendant cord-connector devices.
   8. Cord and plug sets.
   9. Toggle switches, 120/277 V, 20 A.
   10. Decorator-style devices, 20 A.
   11. Occupancy sensors.
   12. Digital timer light switches.
   13. Wall-box dimmers.
   14. Wall plates.
   15. Floor service fittings.
   16. Poke-through assemblies.
   17. Service poles.

1.3 DEFINITIONS

A. AFCI: Arc-fault circuit interrupter.

B. BAS: Building automation system.

C. EMI: Electromagnetic interference.

D. GFCI: Ground-fault circuit interrupter.

E. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

F. RFI: Radio-frequency interference.

G. SPD: Surge protective device.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

C. Samples: One for each type of device and wall plate specified, in each color specified.

1.5 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Comply with NFPA 70.

C. RoHS compliant.

D. Comply with NEMA WD 1.

E. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:

1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
2. Devices shall comply with requirements in this Section.

F. Devices for Owner-Furnished Equipment:

1. Receptacles: Match plug configurations.
2. Cord and Plug Sets: Match equipment requirements.

G. Device Color:

1. Wiring Devices Connected to Normal Power System: Ivory.
2. Wiring Devices Connected to Essential Electrical System: Red.

3. SPD Devices: Blue.
4. Isolated-Ground Receptacles: Orange.

H. Wall Plate Color: For plastic covers, match device color.

I. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 STANDARD-GRADE RECEPTACLES, 125 V, 20 A

A. Duplex Receptacles, 125 V, 20 A:
1. Description: Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.

B. Isolated-Ground Duplex Receptacles, 125 V, 20 A:
1. Description: Straight blade; equipment grounding contacts shall be connected only to green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts. Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.

C. Tamper-Resistant Duplex Receptacles, 125 V, 20 A:
1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

D. Weather-Resistant Duplex Receptacle, 125 V, 20 A:
1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, "Receptacles in Damp or Wet Locations" Article.

E. Tamper- and Weather-Resistant Duplex Receptacles, 125 V, 20 A:
1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.3 STANDARD-GRADE RECEPTACLES, 125 V, 15 A

A. Duplex Receptacles, 125 V, 15 A:
1. Description: Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-15R.
3. Standards: Comply with UL 498 and FS W-C-596.

B. Isolated-Ground Duplex Receptacles, 125 V, 15 A :
   1. Description: Straight blade; equipment grounding contacts shall be connected only to green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts. Two pole, three wire, and self-grounding.
   2. Configuration: NEMA WD 6, Configuration 5-15R.
   3. Standards: Comply with UL 498 and FS W-C-596.

C. Tamper-Resistant Duplex Receptacles, 125 V, 15 A:
   1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
   2. Configuration: NEMA WD 6, Configuration 5-15R.
   3. Standards: Comply with UL 498 and FS W-C-596.
   4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

D. Weather-Resistant Duplex Receptacle, 125 V, 15 A:
   1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
   2. Configuration: NEMA WD 6, Configuration 5-15R.
   3. Standards: Comply with UL 498.
   4. Marking: Listed and labeled as complying with NFPA 70, "Receptacles in Damp or Wet Locations" Article.

E. Tamper- and Weather-Resistant Duplex Receptacles, 125 V, 15 A:
   1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
   2. Configuration: NEMA WD 6, Configuration 5-15R.
   3. Standards: Comply with UL 498.
   4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.4 USB RECEPTACLES

A. USB Charging Receptacles :
   1. Description: Single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap.
   2. USB Receptacles: Dual and quad, USB Type A, 5 V dc, and 2.1 A per receptacle (minimum).
   3. Standards: Comply with UL 1310 and USB 3.0 devices.

B. Tamper-Resistant Duplex and USB Charging Receptacles:
   1. Description: Single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap. Integral shutters that operate only when a plug is inserted in the line voltage receptacle.
   2. Line Voltage Receptacles: Two pole, three wire, and self-grounding; NEMA WD 6, Configuration 5-20R.
   3. USB Receptacles: Dual USB Type A, 5 V dc, and 2.1 A per receptacle (minimum).
   4. Standards: Comply with UL 498, UL 1310, USB 3.0 devices, and FS W-C-596.
   5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

2.5 GFCI RECEPTACLES, 125 V, 20 A

A. Duplex GFCI Receptacles, 125 V, 20 A:
   1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Type: [**Feed**] [**Non-feed**] through.
   4. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.

B. Tamper-Resistant Duplex GFCI Receptacles, 125 V, 20 A:
   1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Type: [**Feed**] [**Non-feed**] through.
   4. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.
   5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

C. Tamper- and Weather-Resistant, GFCI Duplex Receptacles, 125 V, 20 A:
   1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
   2. Configuration: NEMA WD 6, Configuration 5-15R.
   3. Type: Non-feed through.
   4. Standards: Comply with UL 498 and UL 943 Class A.
   5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.6 SPD RECEPTACLES, 125 V, 20 A

A. Duplex SPD Receptacles, 125 V, 20 A:
   1. Description: Two pole, three wire, and self-grounding. Integral SPD in line to ground, line to neutral, and neutral to ground. LED indicator light.
   2. SPD Components: Multiple metal-oxide varistors; with a nominal clamp-level rating of 400 V and minimum single transient pulse energy dissipation of 240 J, according to IEEE C62.41.2 and IEEE C62.45.
   3. Active SPD Indication: Visual and audible, with light visible in face of device to indicate device is "active" or "no longer in service."
   4. Configuration: NEMA WD 6, Configuration 5-20R.
   5. Standards: Comply with NEMA WD 1, UL 498, UL 1449, and FS W-C-596.

B. Isolated-Ground Duplex SPD Receptacles, 125 V, 20 A:
   1. Description: Two pole, three wire, and self-grounding. Integral SPD in line to ground, line to neutral, and neutral to ground. LED indicator light.
   2. SPD Components: Multiple metal-oxide varistors; with a nominal clamp-level rating of 400 V and minimum single transient pulse energy dissipation of 240 J, according to IEEE C62.41.2 and IEEE C62.45.
   3. Active SPD Indication: Visual and audible, with light visible in face of device to indicate device is "active" or "no longer in service."
   4. Grounding: Equipment grounding contacts shall be connected only to green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.
   5. Configuration: NEMA WD 6, Configuration 5-20R.

6. Standards: Comply with UL 498, UL 1449, and FS W-C-596.

2.7 HOSPITAL-GRADE RECEPTACLES, 125 V, 20 A

A. Hospital-Grade, Single Receptacles, 125 V, 20 A:
   1. Description: Single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap. Two pole, three wire, and self-grounding.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Standards: Comply with UL 498 Supplement sd and FS W-C-596.
   4. Marking: Listed and labeled as complying with NFPA 70, "Health Care Facilities" Article.

B. Hospital-Grade, Duplex Receptacles, 125 V, 20 A:
   1. Description: Single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap. Two pole, three wire, and self-grounding.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Standards: Comply with UL 498 Supplement sd and FS W-C-596.
   4. Marking: Listed and labeled as complying with NFPA 70, "Health Care Facilities" Article.

C. Hospital-Grade, Isolated-Ground, Duplex Receptacles, 125 V, 20 A:
   1. Description: Straight blade; equipment grounding contacts shall be connected only to green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts. Two pole, three wire, and self-grounding.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Standards: Comply with UL 498 Supplement sd and FS W-C-596.
   4. Marking: Listed and labeled as complying with NFPA 70, "Health Care Facilities" Article.

D. Hospital-Grade, Tamper-Resistant, Duplex Receptacles, 125 V, 20 A:
   1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Standards: Comply with NEMA WD 1, UL 498 Supplement sd, and FS W-C-596.
   4. Marking: Listed and labeled as complying with NFPA 70, "Health Care Facilities" Article.

E. Hospital-Grade, Tamper-Resistant, Duplex (125 V, 20 A) and USB Charging Receptacles:
   1. Description: Single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap. Integral shutters that operate only when a plug is inserted in the line voltage receptacle.
   2. Line Voltage Receptacles: Two pole, three wire, and self-grounding, NEMA Configuration 5-20R.
   3. USB Receptacles: Dual, USB Type A, 5 V dc, and 2.1 A per receptacle (minimum).
   4. Standards: Comply with NEMA WD 1, UL 498 Supplement sd, UL 1310, and FS W-C-596.
   5. Marking: Listed and labeled as complying with NFPA 70, "Health Care Facilities" Article.

F. Hospital-Grade, Duplex GFCI Receptacles, 125 V, 20 A:
   1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Single-piece, rivetless, nickel-plated, all-brass grounding system.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Type: Non-feed through.
   4. Standards: Comply with UL 498 supplement sd, UL 943 Class A, and FS W-C-596.
   5. Marking: Listed and labeled as complying with NFPA 70, "Health Care Facilities" Article.

G. Hospital-Grade, Tamper-Resistant, Duplex GFCI Receptacles, 125 V, 20 A:
   1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Single-piece, rivetless, nickel-plated, all-brass grounding system.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Type: Non-feed through.
   4. Standards: Comply with UL 498 supplement sd, UL 943 Class A, and FS W-C-596.
   5. Marking: Listed and labeled as complying with NFPA 70, "Health Care Facilities" Article.

H. Hospital-Grade, Duplex SPD Receptacles, 125 V, 20 A:
   1. Description: Two pole, three wire, and self-grounding. Integral SPD in line to ground, line to neutral, and neutral to ground. LED indicator light. With single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap.
   2. SPD Components: Multiple metal-oxide varistors; with a nominal clamp-level rating of 400 V and minimum single transient pulse energy dissipation of 240 J, according to IEEE C62.41.2 and IEEE C62.45.
   3. Active SPD Indication: Visual and audible, with light visible in face of device to indicate device is "active" or "no longer in service."
   4. Configuration: NEMA WD 6, Configuration 5-20R.
   5. Standards: Comply with UL 498 supplement sd, UL 1449, and FS W-C-596.
   6. Marking: Listed and labeled as complying with NFPA 70, "Health Care Facilities" Article.

I. Hospital-Grade, Isolated-Ground, Duplex SPD Receptacles, 125 V, 20 A:
   1. Description: With single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap. Two pole, three wire, and self-grounding.
   2. SPD Components: Multiple metal-oxide varistors; with a nominal clamp-level rating of 400 V and minimum single transient pulse energy dissipation of 240 J, according to IEEE C62.41.2 and IEEE C62.45.
   3. Active SPD Indication: Visual and audible, with light visible in face of device to indicate device is "active" or "no longer in service."
   4. Grounding: Equipment grounding contacts shall be connected only to green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.
   5. Configuration: NEMA WD 6, Configuration 5-20R.
   6. Standards: Comply with NEMA WD 1, UL 498 supplement sd, UL 1449, and FS W-C-596.
   7. Marking: Listed and labeled as complying with NFPA 70, "Health Care Facilities" Article.

2.8 TWIST-LOCKING RECEPTACLES

A. Twist-Lock, Single Receptacles, 120 V, 20 A:
   1. Configuration: NEMA WD 6, Configuration L5-20R.
   2. Standards: Comply with UL 498.

B. Twist-Lock, Single Receptacles, 250 V, 20 A:
   1. Configuration: NEMA WD 6, Configuration L6-20R.
   2. Standards: Comply with UL 498.

C. Twist-Lock, Single Receptacles, 277 V, 20 A:
   1. Configuration: NEMA WD 6, Configuration L7-20R.
   2. Standards: Comply with UL 498.

D. Twist-Lock, Isolated-Ground, Single Receptacles, 125 V, 20 A:

1. Grounding: Equipment grounding contacts shall be connected only to green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.
2. Configuration: NEMA WD 6, Configuration L5-20R.
3. Standards: Comply with UL 498.

2.9 PENDANT CORD-CONNECTOR DEVICES

A. Description: Matching, locking-type plug and receptacle body connector, heavy-duty grade.

B. Configuration: NEMA WD 6, Configurations L5-20P and L5-20R.

C. Body: Nylon, with screw-open, cable-gripping jaws and provision for attaching external cable grip.

D. External Cable Grip: Woven wire-mesh type made of high-strength, galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.

E. Standards: Comply with FS W-C-596.

2.10 CORD AND PLUG SETS

A. Match voltage and current ratings and number of conductors to requirements of equipment being connected.

B. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and ampacity of at least 130 percent of the equipment rating.

C. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.11 TOGGLE SWITCHES, 120/277 V, 15 A

A. Single-Pole Switches, 120/277 V, 15 A:
1. Standards: Comply with UL 20 and FS W-S-896.

B. Two-Pole Switches, 120/277 V, 15 A:
1. Comply with UL 20 and FS W-S-896.
2. Description: Contact surfaces treated with a coating that kills 99.9 percent of certain common bacteria within two hours when regularly and properly cleaned.
3. Standards: Comply with UL 20 and FS W-S-896.

C. Three-Way Switches, 120/277 V, 15 A:
1. Comply with UL 20 and FS W-S-896.

D. Four-Way Switches, 120/277 V, 15 A:
1. Standards: Comply with UL 20 and FS W-S-896.

E. Pilot-Light, Single-Pole Switches: 120/277 V, 15 A:
1. Description: Illuminated when switch is on.

2. Standards: Comply with UL 20 and FS W-S-896.

F. Lighted Single-Pole Switches, 120/277 V, 15 A:
1. Description: Handle illuminated when switch is off.
2. Standards: Comply with NEMA WD 1, UL 20, and FS W-S-896.

G. Key-Operated, Single-Pole Switches, 120/277 V, 15 A:
1. Description: Factory-supplied key in lieu of switch handle.
2. Standards: Comply with UL 20 and FS W-S-896.

H. Single-Pole, Double-Throw, Momentary-Contact, Center-off Switches, 120/277 V, 15 A:
1. Description: For use with mechanically held lighting contactors.
2. Standards: Comply with NEMA WD 1, UL 20, and FS W-S-896.

I. Key-Operated, Single-Pole, Double-Throw, Momentary-Contact, Center-off Switches, 120/277 V, 15 A:
1. Description: For use with mechanically held lighting contactors, with factory-supplied key in lieu of switch handle.
2. Standards: Comply with NEMA WD 1, UL 20, and FS W-S-896.

2.12 TOGGLE SWITCHES, 120/277 V, 20 A

A. Single-Pole Switches, 120/277 V, 20 A:
1. Standards: Comply with UL 20 and FS W-S-896.

B. Antimicrobial, Single-Pole Switches, 120/277 V, 20 A:
1. Description: Contact surfaces treated with a coating that kills 99.9 percent of certain common bacteria within two hours when regularly and properly cleaned.
2. Standards: Comply with UL 20 and FS W-S-896.

C. Two-Pole Switches, 120/277 V, 20 A:
1. Comply with UL 20 and FS W-S-896.

D. Antimicrobial, Double-Pole Switches, 120/277 V, 20 A:
1. Description: Contact surfaces treated with a coating that kills 99.9 percent of certain common bacteria within two hours when regularly and properly cleaned.
2. Standards: Comply with UL 20 and FS W-S-896.

E. Three-Way Switches, 120/277 V, 20 A:
1. Comply with UL 20 and FS W-S-896.

F. Antimicrobial, Three-Way Switches, 120/277 V, 20 A:
1. Description: Contact surfaces treated with a coating that kills 99.9 percent of certain common bacteria within two hours when regularly and properly cleaned.
2. Standards: Comply with UL 20 and FS W-S-896.

G. Four-Way Switches, 120/277 V, 20 A:
1. Standards: Comply with UL 20 and FS W-S-896.

H. Pilot-Light, Single-Pole Switches: 120/277 V, 20 A:
1. Description: Illuminated when switch is on.
2. Standards: Comply with UL 20 and FS W-S-896.

I. Lighted Single-Pole Switches, 120/277 V, 20 A:

1. Description: Handle illuminated when switch is off.
2. Standards: Comply with NEMA WD 1, UL 20, and FS W-S-896.

J. Key-Operated, Single-Pole Switches, 120/277 V, 20 A:
1. Description: Factory-supplied key in lieu of switch handle.
2. Standards: Comply with UL 20 and FS W-S-896.

K. Single-Pole, Double-Throw, Momentary-Contact, Center-off Switches, 120/277 V, 20 A:
1. Description: For use with mechanically held lighting contactors.
2. Standards: Comply with NEMA WD 1, UL 20, and FS W-S-896.

L. Key-Operated, Single-Pole, Double-Throw, Momentary-Contact, Center-off Switches, 120/277 V, 20 A:
1. Description: For use with mechanically held lighting contactors, with factory-supplied key in lieu of switch handle.
2. Standards: Comply with NEMA WD 1, UL 20, and FS W-S-896.

2.13 DECORATOR-STYLE DEVICES, 15 A

A. Decorator Duplex Receptacles, 125 V, 15 A:
1. Description: Two pole, three wire, and self-grounding. Square face.
2. Configuration: NEMA WD 6, Configuration 5-15R.
3. Standards: Comply with UL 498.

B. Decorator, Tamper-Resistant, Duplex Receptacles, 125 V, 15 A:
1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-15R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

C. Decorator, Tamper- and Weather-Resistant, Duplex Receptacles, 125 V, 15 A :
1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-15R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

D. Decorator Single-Pole Switches, 120/277 V, 15 A:
1. Comply with UL 20.

E. Decorator Single-Pole Lighted Switches,120/277 V, 15 A:
1. Description: Square face illuminated when circuit is switched off.
2. Standards: Comply with UL 20.

F. Decorator, Antimicrobial, Single-Pole Switches, 120/277 V, 15 A:
1. Description: Contact surfaces treated with a coating that kills 99.9 percent of certain common bacteria within two hours when regularly and properly cleaned.
2. Standards: Comply with UL 20 and FS W-S-896.

2.14 DECORATOR-STYLE DEVICES, 20 A

A. Decorator Duplex Receptacles, 125 V, 20 A:
   1. Description: Two pole, three wire, and self-grounding. Square face.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Standards: Comply with UL 498.

B. Decorator Tamper-Resistant Duplex Receptacles, 125 V, 20 A:
   1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Standards: Comply with UL 498.
   4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

C. Decorator, Tamper- and Weather-Resistant, Duplex Receptacles, 125 V, 20 A:
   1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Standards: Comply with UL 498.
   4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

D. Decorator Single-Pole Switches, 120/277 V, 20 A:
   1. Comply with UL 20.

E. Decorator Single-Pole Lighted Switches,120/277 V, 20 A:
   1. Description: Square face illuminated when circuit is switched off.
   2. Standards: Comply with UL 20.

F. Decorator, Antimicrobial, Single-Pole Switches, 120/277 V, 20 A:
   1. Description: Contact surfaces treated with a coating that kills 99.9 percent of certain common bacteria within two hours when regularly and properly cleaned.
   2. Standards: Comply with UL 20 and FS W-S-896.

2.15 OCCUPANCY SENSORS

A. Wall Switch Sensor Light Switch, Dual Technology:
   1. Description: Switchbox-mounted, combination lighting-control sensor and conventional switch lighting-control unit using dual (ultrasonic and passive infrared) technology.
   2. Standards: Comply with UL 20.
   3. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
   4. Adjustable time delay of 20 minutes.
   5. Able to be locked to Automatic-On mode. Where vacancy sensors are indicated, able to be locked to Manual On mode.
   6. Connections: Provisions for connection to BAS.

B. Wall Sensor Light Switch, Passive Infrared:
   1. Description: Switchbox-mounted, combination, lighting-control sensor and conventional switch lighting-control unit using passive infrared technology.
   2. Standards: Comply with UL 20.
   3. Connections: Provisions for connection to BAS.

4. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
5. Integral relay for connection to BAS.
6. Adjustable time delay of20 minutes.
7. Able to be locked to Automatic-On mode. Where vacancy sensors are indicated, able to be locked to Manual On mode.

C. Wall Sensor Light Switch, Ultrasonic:
1. Description: Switchbox-mounted, combination, lighting-control sensor and conventional switch lighting-control unit using ultrasonic technology.
2. Standards: Comply with UL 20.
3. Connections: Provisions for connection to BAS.
4. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
5. Integral relay for connection to BAS.
6. Adjustable time delay of 20 minutes.
7. Able to be locked to Automatic-On mode. Where vacancy sensors are indicated, able to be locked to Manual On mode.

2.16 TIMER LIGHT SWITCH

A. Digital Timer Light Switch:
1. Description: Switchbox-mounted, combination digital timer and conventional switch lighting-control unit, with backlit digital display, with selectable time interval in 10-minute increments.
2. Standards: Comply with UL 20.
3. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
4. Integral relay for connection to BAS.

2.17 DIMMERS

A. Wall-Box Dimmers:
1. Description: Modular, full-wave, solid-state dimmer switch with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.
2. Control: Continuously adjustable slider; with single-pole or three-way switching.
3. Standards: Comply with UL 1472.
4. Incandescent Lamp Dimmers: 120 V; control shall follow square-law dimming curve. On-off switch positions shall bypass dimmer module.

    a. 600 W; dimmers shall require no derating when ganged with other devices.

5. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 20 percent of full brightness.
6. LED Lamp Dimmer Switches: Modular; compatible with LED lamps; trim potentiometer to adjust low-end dimming; capable of consistent dimming with low end not greater than 20 percent of full brightness.

2.18 WALL PLATES

A. Single Source: Obtain wall plates from same manufacturer of wiring devices.

B. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: Smooth, high-impact thermoplastic 0.035-inch thick satin finish, except Type 302 stainless steel 0.04-inch is required in all patient care areas.
3. Material for Damp Locations: Thermoplastic with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.

C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, thermoplactic with lockable cover.

D. Antimicrobial Cover Plates:

1. Contact surfaces treated with a coating that kills 99.9 percent of certain common bacteria within two hours when regularly and properly cleaned.
2. Tarnish resistant.

2.19 FLOOR SERVICE FITTINGS

A. Flush-Type Floor Service Fittings:
1. Description: Type: Modular, flush-type, dual-service units suitable for wiring method used, with cover flush with finished floor.
2. Compartments: Barrier separates power from voice and data communication cabling.
3. Service Plate and Cover: Round, solid brass with satin finish.
4. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.
5. Data Communication Outlet: Blank cover with bushed cable opening.

B. Flap-Type Service Fittings:
1. Description: Type: Modular, flap-type, dual-service units suitable for wiring method used, with flaps flush with finished floor.
2. Compartments: Barrier separates power from voice and data communication cabling.
3. Flaps: Round, solid brass with satin finish.
4. Service Plate: Same finish as flaps.
5. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.
6. Data Communication Outlet: Blank cover with bushed cable opening.

C. Above-Floor Service Fittings:
1. Description: Type: Modular, above-floor, dual-service units suitable for wiring method used.
2. Compartments: Barrier separates power from voice and data communication cabling.
3. Service Plate: Round, solid brass with satin finish.
4. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.
5. Data Communication Outlet: Blank cover with bushed cable opening.

2.20 POKE-THROUGH ASSEMBLIES

A. Description: Factory-fabricated and -wired assembly of below-floor junction box with multichanneled, through-floor raceway/firestop unit and detachable matching floor service-outlet assembly.

B. Standards: Comply with scrub water exclusion requirements in UL 514.

C. Service-Outlet Assembly: Pedestal type with services indicated.

D. Size: Selected to fit nominal 4-inch cored holes in floor and matched to floor thickness.

E. Fire Rating: Unit is listed and labeled for fire rating of floor-ceiling assembly.

F. Closure Plug: Arranged to close unused 4-inch cored openings and reestablish fire rating of floor.

G. Wiring Raceways and Compartments: For a minimum of four No. 12 AWG conductors and a minimum of four, four-pair cables.

2.21 SERVICE POLES

A. Dual-Channel Service Poles:
   1. Description: Factory-assembled and -wired units to extend power and voice and data communication from distribution wiring concealed in ceiling to devices or outlets in pole near floor.
   2. Poles: Nominal 2.5-inch square cross-section, with height adequate to extend from floor to at least 6 inches above ceiling, and with separate channels for power wiring and voice and data communication cabling.
   3. Mounting: Ceiling trim flange with concealed bracing arranged for positive connection to ceiling supports; with pole foot and carpet pad attachment.
   4. Material: Aluminum.
   5. Finishes: Manufacturer's standard painted finish and trim combination.
   6. Wiring: Sized for minimum of five No. 12 AWG power and ground conductors and a minimum of four, balanced twisted pair data communication cables.
   7. Power Receptacles: Two duplex, 20-A, straight-blade receptacles complying with requirements in this Section.
   8. Data Communication Outlets: Blank insert with bushed cable opening.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

   1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes, and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
   2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
   3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
   4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall comply with NFPA 70, Article 300, without pigtails.
4. Existing Conductors:

    a. Cut back and pigtail, or replace all damaged conductors.
    b. Straighten conductors that remain and remove corrosion and foreign matter.
    c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.
2. Install hospital-grade receptacles in patient-care areas with the ground pin or neutral blade at the top.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan-speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device, listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES

A. Install non-feed-through GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

A. Comply with Section 26 0553 "Identification for Electrical Systems."

B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

C. Essential Electrical System: Mark receptacles supplied from the essential electrical system to allow easy identification using a self-adhesive label.

3.4 FIELD QUALITY CONTROL

A. Test Instruments: Use instruments that comply with UL 1436.

B. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

C. Perform the following tests and inspections:

1. In healthcare facilities, prepare reports that comply with NFPA 99.
2. Test Instruments: Use instruments that comply with UL 1436.
3. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

D. Tests for Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault-current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

E. Test straight-blade hospital-grade outlets for the retention force of the grounding blade according to NFPA 99. Retention force shall be not less than 4 oz.

F. Wiring device will be considered defective if it does not pass tests and inspections.

G. Prepare test and inspection reports.

END OF SECTION

SECTION 26 5613

LIGHTING POLES AND STANDARDS

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.

B. Section 01 8113 – Sustainable Design Requirements: Action and informational Submittals
   1. This Project is pursuing LEED Healthcare v4: Silver Certification
   2. Refer to this section for additional, required LEED submittals not included in this specification section

1.2 SUMMARY

A. Section Includes:

   1. Poles and accessories for support of luminaires.

1.3 DEFINITIONS

A. EPA: Equivalent projected area.

B. Luminaire: Complete luminaire.

C. Pole: Luminaire-supporting structure, including tower used for large-area illumination.

D. Standard: See "Pole."

1.4 ACTION SUBMITTALS

A. Product Data: For each pole, accessory, and luminaire-supporting and -lowering device, arranged as indicated.

   1. Include data on construction details, profiles, EPA, cable entrances, materials, dimensions, weight, rated design load, and ultimate strength of individual components.
   2. Include finishes for lighting poles and luminaire-supporting devices.
   3. Anchor bolts.
   4. Manufactured pole foundations.

1.5 INFORMATIONAL SUBMITTALS

A. Pole and Support Component Certificates: Signed by manufacturers of poles, certifying that products are designed for indicated load requirements according to AASHTO LTS-6-M and that

load imposed by luminaire and attachments has been included in design. The certification shall be based on design calculations signed and sealed by a professional engineer.

B. Qualification Data: For Installer.

C. Seismic Qualification Data: from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

D. Material Test Reports:

1. For each foundation component, by a qualified testing agency.
2. For each pole, by a qualified testing agency.

E. Source quality-control reports.

F. Field quality-control reports.

G. Sample Warranty: Manufacturer's standard warranty.

H. Soil test reports

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For poles to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 01 7823 "Operation and Maintenance Data," include pole inspection and repair procedures.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Pole repair materials.

1.8 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C1093 for foundation testing.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Package aluminum poles for shipping according to ASTM B660.

B. Store poles on decay-resistant skids at least 12 inches above grade and vegetation. Support poles to prevent distortion and arrange to provide free air circulation.

C. Handle wood poles so they will not be damaged. Do not use pointed tools that can indent pole surface more than 1/4 inch deep. Do not apply tools to section of pole to be installed below finished grade.

D. Retain factory-applied pole wrappings on fiberglass and laminated wood poles until right before pole installation. Handle poles with web fabric straps.

E. Retain factory-applied pole wrappings on metal poles until right before pole installation. Handle poles with web fabric straps.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of poles that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within a specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs from special warranty period.

1. Warranty Period: Five years from date of Substantial Completion.
2. Warranty Period for Corrosion Resistance: Five years from date of Substantial Completion.
3. Warranty Period for Color Retention: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 4000 "Quality Requirements," to design pole foundation and pole power system.

B. Seismic Performance: Foundation and pole shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the system will remain in place without separation of any parts when subjected to the seismic forces specified."
2. Component Importance Factor: 1.0.

C. Structural Characteristics: Comply with AASHTO LTS-6-M.

D. Dead Load: Weight of luminaire and its horizontal and vertical supports, lowering devices, and supporting structure, applied according to AASHTO LTS-6-M.

E. Live Load: Single load of 500 lbf distributed according to AASHTO LTS-6-M.

F. Ice Load: Load of 3 lbf/sq. ft,, applied according to AASHTO LTS-6-M for applicable areas on the Ice Load Map.

G. Wind Load: Pressure of wind on pole and luminaire, calculated and applied according to AASHTO LTS-6-M.

1. Basic wind speed for calculating wind load for poles 50 feet high or less is 100 mph.

a. Wind Importance Factor: 1.0.
b. Minimum Design Life: 50 years.

H. Strength Analysis: For each pole, multiply the actual EPA of luminaires and brackets by a factor of 1.1 to obtain the EPA to be used in pole selection strength analysis.

I. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts unless otherwise indicated.

2.2 STEEL POLES

A. Source Limitations: Obtain poles from single manufacturer or producer.

B. Poles: Comply with ASTM A500/A500M, Grade B carbon steel with a minimum yield of 46,000 psig; one-piece construction up to 40 feet in height with access handhole in pole wall.

1. Shape: Square, straight.
2. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.

C. Steel Mast Arms: A specified on drawings.

D. Brackets for Luminaires: Detachable, cantilever, without underbrace.

1. Adaptor fitting welded to pole, allowing the bracket to be bolted to the pole-mounted adapter, then bolted together with galvanized-steel bolts.
2. Cross Section: Tapered oval, with straight tubular end section to accommodate luminaire. Match pole material and finish.

E. Pole-Top Tenons: Fabricated to support luminaire or luminaires and brackets indicated, and securely fastened to pole top.

F. Fasteners: Galvanized steel, size and type as determined by manufacturer. Corrosion-resistant items compatible with support components.

1. Materials: Compatible with poles and standards as well as the substrates to which poles and standards are fastened and shall not cause galvanic action at contact points.
2. Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication unless otherwise indicated.

G. Grounding and Bonding Lugs: Welded 1/2-inch threaded lug, complying with requirements in Section 26 0526 "Grounding and Bonding for Electrical Systems," listed for attaching grounding and bonding conductors of type and size indicated, and accessible through handhole.

H. Handhole: Oval shaped, with minimum clear opening of 2-1/2 by 5 inches, with cover secured by stainless-steel captive screws.

I. Cable Support Grip: Wire-mesh type with rotating attachment eye, sized for diameter of cable and rated for a minimum load equal to weight of supported load multiplied by a 5.0 safety factor.

J. Prime-Coat Finish: Manufacturer's standard prime-coat finish ready for field painting.

K. Galvanized Finish: After fabrication, hot-dip galvanize according to ASTM A123/A123M.

L. Factory-Painted Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.

1. Surface Preparation: Clean surfaces according to SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, according to SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
2. Interior Surfaces of Pole: One coat of bituminous paint, or otherwise treat for equal corrosion protection.
3. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high gloss, high-build polyurethane enamel.

    a. Color: As indicated on drawings.

M. Powder-Coat Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.

1. Surface Preparation: Clean surfaces according to SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair powder coat bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, according to SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
2. Powder Coat: Comply with AAMA 2604.

    a. Electrostatic-applied powder coating; single application and cured to a minimum 2.5 mils dry film thickness. Coat interior and exterior of pole for equal corrosion protection.
    b. Color: As indicated on drawings.

2.3 POLE ACCESSORIES

A. Base Covers: Manufacturers' standard metal units, finished same as pole, and arranged to cover pole's mounting bolts and nuts.

B. Decorative accessories, supplied by decorative pole manufacturer, include the following:

1. Banner Arms: Per owners requirements.

2.4 MOUNTING HARDWARE

A. Anchor Bolts: Manufactured to ASTM F1554, Grade 55, with a minimum yield strength of 55,000 psi.

1. Galvanizing: Hot dip galvanized according to ASTM A153, Class C].
2. Threading: Uniform National Coarse, Class 2A.

B. Nuts: ASTM A563, Grade A, Heavy-Hex.

1. Galvanizing: Hot dip galvanized according to ASTM A153, Class C.
2. Two nuts provided per anchor bolt [, shipped with nuts pre-assembled to the anchor bolts].

C. Washers: ASTM F436, Type 1.

1. Galvanizing: Hot dip galvanized according to ASTM A153, Class C.
2. Two washer(s) provided per anchor bolt.

2.5 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine poles, luminaire-mounting devices, lowering devices, and pole accessories before installation. Components that are scratched, dented, marred, wet, moisture damaged, or visibly damaged are considered defective.

C. Examine roughing-in for foundation and conduit to verify actual locations of installation.

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

3.2 POLE FOUNDATION

A. Concrete Pole Foundations: Cast in place, with anchor bolts to match pole-base flange. Structural steel complying with ASTM A36/A36M and hot-dip galvanized according to ASTM A123/A123M; and with top-plate and mounting bolts to match pole-base flange and strength required to support pole, luminaire, and accessories. Concrete, reinforcement, and formwork are specified in Section 03 3000 "Cast-in-Place Concrete."

B. Pre-Cast Foundations: Factory fabricated, with structural steel complying with ASTM A36/A36M and hot-dip galvanized according to ASTM A123/A123M; and with top-plate and mounting bolts to match pole-base flange and strength required to support pole, luminaire, and accessories. Concrete, reinforcement, and formwork are specified in Section 03 3000 "Cast-in-Place Concrete."

C. Power-Installed Screw Foundations: Factory fabricated by pole manufacturer, with structural steel complying with ASTM A36/A36M and hot-dip galvanized according to ASTM A123/A123M; and with top-plate and mounting bolts to match pole-base flange and strength required to support pole, luminaire, and accessories.

1. Baseplate: Stamped with manufacturer's name, date of production, and cable entry.

D. Direct-Buried Foundations: Install to depth indicated on Drawings. Add backfill as shown on Drawings. To ensure a plumb installation, continuously check pole orientation with plumb bob while tamping.

E. Anchor Bolts: Install plumb using manufacturer-supplied steel template, uniformly spaced.

3.3 POLE INSTALLATION

A. Alignment: Align pole foundations and poles for optimum directional alignment of luminaires and their mounting provisions on pole.

B. Clearances: Maintain the following minimum horizontal distances of poles from surface and underground features unless otherwise indicated on drawing.

1. Fire Hydrants and Water Piping: 60 inches.
2. Water, Gas, Electric, Communications, and Sewer Lines: 10 feet.
3. Trees: 15 feet from tree trunk.

C. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer. Concrete materials, installation, and finishing requirements are specified in Section 03 3000 "Cast-in-Place Concrete."

D. Foundation-Mounted Poles: Mount pole with leveling nuts and tighten top nuts to torque level according to pole manufacturer's written instructions.

1. Use anchor bolts and nuts selected to resist seismic forces defined for the application and approved by manufacturer.
2. Grout void between pole base and foundation. Use nonshrink or expanding concrete grout firmly packed to fill space.
3. Install base covers unless otherwise indicated.
4. Use a short piece of 1/2 -inch diameter pipe to make a drain hole through grout. Arrange to drain condensation from interior of pole.

E. Poles and Pole Foundations Set in Concrete-Paved Areas: Install poles with a minimum 6-inch wide, unpaved gap between the pole or pole foundation and the edge of the adjacent concrete slab. Fill unpaved ring with pea gravel. Insert material to a level 1 inch below top of concrete slab.

F. Raise and set pole using web fabric slings (not chain or cable) at locations indicated by manufacturer.

3.4 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum using insulating fittings or treatment.

B. Steel Conduits: Comply with requirements in Section 26 0533 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch thick, pipe-wrapping plastic tape applied with a 50-percent overlap.

3.5 GROUNDING

A. Ground Metal Poles and Support Structures: Comply with requirements in Section 26 0526 "Grounding and Bonding for Electrical Systems."

1. Install grounding electrode for each pole unless otherwise indicated.

2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.

B. Ground Nonmetallic Poles and Support Structures: Comply with requirements in Section 26 0526 "Grounding and Bonding for Electrical Systems."

1. Install grounding electrode for each pole.
2. Install grounding conductor and conductor protector.
3. Ground metallic components of pole accessories and foundation.

3.6 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."

3.7 FIELD QUALITY CONTROL

A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:

1. Inspect poles for nicks, mars, dents, scratches, and other damage.
2. System function tests.

END OF SECTION

SECTION 26 5619

LED EXTERIOR LIGHTING

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.

B. Section 01 8113 – Sustainable Design Requirements: Action and informational submittals
   1. This project is pursuing LEED Healthcare v4: Silver Certification
   2. Refer to this section for additional, required LEED submittals not included in this specification section

1.2 SUMMARY

A. Section Includes:

   1. Exterior solid-state luminaires that are designed for and exclusively use LED lamp technology.
   2. Luminaire supports.

B. Related Requirements:

   1. Section 26 0923"Lighting Control Devices" for automatic control of lighting, including time switches, occupancy sensors, and multipole lighting relays and contactors.
   2. Section 26 0933"Central Dimming Controls" for architectural dimming systems specified in Section 26 5100.
   3. Section 26 0943.23 "Relay-Based Lighting Controls" for manual or programmable control systems with low-voltage control wiring or data communication circuits.
   4. Section 26 5613 "Lighting Poles and Standards" for poles and standards used to support exterior lighting equipment.

1.3 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color rendering index.

C. Fixture: See "Luminaire."

D. IP: International Protection or Ingress Protection Rating.

E. Lumen: Measured output of lamp and luminaire, or both.

F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of luminaire.

1. Arrange in order of luminaire designation.
2. Include data on features, accessories, and finishes.
3. Include physical description and dimensions of luminaire.
4. Lamps, include life, output (lumens, CCT, and CRI), and energy-efficiency data.
5. Photometric data and adjustment factors based on laboratory tests, complying with IES Lighting Measurements Testing and Calculation Guides, of each luminaire type. The adjustment factors shall be for lamps and accessories identical to those indicated for the luminaire as applied in this Project.

    a. Manufacturer's Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the NVLAP for Energy Efficient Lighting Products.

6. Wiring diagrams for power, control, and signal wiring.
7. Means of attaching luminaires to supports and indication that the attachment is suitable for components involved.

B. Product Schedule: For luminaires and lamps.

C. Delegated-Design Submittal: For luminaire supports.

1. Include design calculations for luminaire supports and seismic restraints.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing laboratory providing photometric data for luminaires.

B. Seismic Qualification Data: For luminaires, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Product Certificates: For each type of the following:

1. Luminaire.

D. Source quality-control reports.

E. Sample warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires to include in operation and maintenance manuals.

1. Provide a list of all lamp types used on Project. Use ANSI and manufacturers' codes.
2. Provide a list of all photoelectric relay types used on Project; use manufacturers' codes.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Glass, Acrylic, and Plastic Lenses, Covers, and Other Optical Parts: One for every 100 of each type and rating installed. Furnish at least one of each type.
   2. Diffusers and Lenses: One for every 100] of each type and rating installed. Furnish at least one of each type.
   3. Globes and Guards: One for every 20 of each type and rating installed. Furnish at least one of each type.

1.8 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturers' laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.

B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7, accredited under the NVLAP for Energy Efficient Lighting Products and complying with applicable IES testing standards.

C. Provide luminaires from a single manufacturer for each luminaire type.

D. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

E. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering prior to shipping.

1.10 FIELD CONDITIONS

A. Verify existing and proposed utility structures prior to the start of work associated with luminaire installation.

B. Mark locations of exterior luminaires for approval by Architect prior to the start of luminaire installation.

1.11 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

    a. Structural failures, including luminaire support components.
    b. Faulty operation of luminaires and accessories.
    c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period: 2 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Seismic Performance: Luminaires and lamps shall be labeled vibration and shock resistant.

1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified and the luminaire will be fully operational during and after the seismic event."

2.2 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.

C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

D. UL Compliance: Comply with UL 1598 and listed for wet location where indicated on the drawings.

E. Lamp base complying with ANSI C81.61.

F. Bulb shape complying with ANSI C79.1.

G. CRI and CCT as indicated on the drawings.

H. L70 lamp life of 50,000 hours.

I. Lamps dimmable as indicated on the drawings.

J. Internal driver, except where otherwise indicated on the drawings.

K. Nominal Operating Voltage: As indicated on the drawings.

L. Lamp Rating: Lamp marked for outdoor use and in enclosed locations.

M. Source Limitations: Obtain luminaires from single source from a single manufacturer.

N. Source Limitations: For luminaires, obtain each color, grade, finish, type, and variety of luminaire from single source with resources to provide products of consistent quality in appearance and physical properties.

2.3 LUMINAIRE TYPES

A. Area and Site:
1. Luminaire Shape: As indicated on the drawings.
2. Mounting As indicated on the drawings.
3. Luminaire-Mounting Height: As indicated on the drawings..
4. Distribution: As indicated on the drawings..
5. Diffusers and Globes: As indicated on the drawings.
6. Housings: As indicated on the drawings.

B. Bollard:
1. Shape: As indicated on the drawings.
2. Height Above Finished Grade: As indicated on the drawings..
3. Overall Height: As indicated on the drawings.
4. Diameter: As indicated on the drawings..
5. Mounting: As indicated on the drawings.
6. Distribution: As indicated on the drawings.
1. Diffusers and Globes: As indicated on the drawings.
2. Housings: As indicated on the drawings.

C. Canopy:
1. Shape: As indicated on the drawings.
2. Dimensions: As indicated on the drawings..
3. Diffusers and Globes: As indicated on the drawings.
4. Housings: As indicated on the drawings.

2.4 MATERIALS

A. Metal Parts: Free of burrs and sharp corners and edges.

B. Sheet Metal Components: Corrosion-resistant aluminum. Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.

D. Diffusers and Globes:

1. Acrylic Diffusers: 100 percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
2. Glass: Annealed crystal glass unless otherwise indicated.
3. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

E. Lens and Refractor Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

F. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.

G. Housings:

1. Rigidly formed, weather- and light-tight enclosure that will not warp, sag, or deform in use.
2. Provide filter/breather for enclosed luminaires.

H. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp characteristics:

a. "USE ONLY" and include specific lamp type.
b. Lamp diameter, shape, size, wattage and coating.
c. CCT and CRI for all luminaires.

2.5 FINISHES

A. Variations in Finishes: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

C. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20 requirements; and seal aluminum surfaces with clear, hard-coat wax.
3. Class I, Clear-Anodic Finish: AA-M32C22A41 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
4. Class I, Color-Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker), complying with AAMA 611.

a. Color: As indicated on the drawings.

D. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.

a. Color: As indicated on the drawings.

2.6 LUMINAIRE SUPPORT COMPONENTS

A. Comply with requirements in Section 26 0529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for luminaire electrical conduit to verify actual locations of conduit connections before luminaire installation.

C. Examine walls, roofs, canopy ceilings and overhang ceilings for suitable conditions where luminaires will be installed.

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

3.2 TEMPORARY LIGHTING

A. If approved by the Architect, use selected permanent luminaires for temporary lighting. When construction is substantially complete, clean luminaires used for temporary lighting and install new lamps.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Comply with NECA 1.

B. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

C. Install lamps in each luminaire.

D. Fasten luminaire to structural support.

E. Supports:

1. Sized and rated for luminaire weight.
2. Able to maintain luminaire position after cleaning and relamping.
3. Support luminaires without causing deflection of finished surface.
4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.

F. Wall-Mounted Luminaire Support:

1. Attached to structural members in walls.

G. Wiring Method: Install cables in raceways. Conceal raceways and cables.

H. Install luminaires level, plumb, and square with finished grade unless otherwise indicated. Install luminaires at height and aiming angle as indicated on Drawings.

I. Coordinate layout and installation of luminaires with other construction.

J. Adjust luminaires that require field adjustment or aiming.

K. Comply with requirements in Section 26 0519 "Low-Voltage Electrical Power Conductors and Cables" and Section 26 0533 "Raceways and Boxes for Electrical Systems" for wiring connections and wiring methods.

3.4 BOLLARD LUMINAIRE INSTALLATION:

A. Align units for optimum directional alignment of light distribution.

1. Install on concrete base with top 4 inches above finished grade or surface at luminaire location. Cast conduit into base, and shape base to match shape of bollard base. Finish by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in Section 03 3000 "Cast-in-Place Concrete."

3.5 INSTALLATION OF INDIVIDUAL GROUND-MOUNTED LUMINAIRES

A. Aim as indicated on Drawings.

B. Install on concrete base with top 4 inches above finished grade or surface at luminaire location. Cast conduit into base, and finish by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in Section 03 3000 "Cast-in-Place Concrete."

3.6 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

B. Steel Conduits: Comply with Section 26 0533 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.7 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."

3.8 FIELD QUALITY CONTROL

A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.

B. Perform the following tests and inspections:

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.

C. Illumination Tests:

1. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IES testing guide(s):

a. IES LM-5.
b. IES LM-50.
c. IES LM-52.
d. IES LM-64.
e. IES LM-72.

2. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.

D. Luminaire will be considered defective if it does not pass tests and inspections.

E. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.9 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain luminaires.

3.10 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to two visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.

1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
3. Adjust the aim of luminaires in the presence of the Architect.

END OF SECTION

SECTION 31 2300
EXCAVATION AND FILL

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. The work under this section of the Specifications includes all labor, materials, equipment, and services necessary for EXCAVATION AND FILL as shown on the Drawings and herein specified and in accordance with the Contract Documents. All costs for labor, materials, equipment, and services necessary for EXCAVATION AND FILL shall be included in the bid prices for the work.

1.3 SECTION INCLUDES

A. Subgrade Preparation
B. Excavation
    1. Trenching
C. Dewatering
D. Fill
    1. Backfill
    2. Compaction

1.4 RELATED SECTIONS

A. 31 10 00 Site Clearing
B. 31 22 00 Grading
C. 31 25 00 Erosion and Sedimentation Controls
D. 32 11 00 Base Courses
E. 33 10 00 Water Utilities
F. 33 30 00 Sanitary Sewerage Utilities
A. 33 40 00 Storm Drainage Utilities
B. 01 81 13 Sustainable Design Requirements: Action and Informational Submittals
    1. This project is pursuing LEED Healthcare v4: Silver Certification.
    2. Refer to this section for additional, required LEED submittals not included in this specification section.

1.5 DEFINITIONS

A. AHJ – AUTHORITY HAVING JURISDICTION
    1. City of Tahlequah
    2. Oklahoma Department of Environmental Quality (ODEQ)
    3. Environmental Protection Agency (EPA).
B. Backfill - Soil material or controlled low-strength material used to fill an excavation.
C. Initial Backfill - Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
D. Final Backfill - Backfill placed over initial backfill to fill a trench.
E. Borrow - Borrow shall consist of required excavation, removal, and proper utilization of materials obtained from designated or approved sources for use as fill or backfill.
F. Excavation - Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
G. Authorized Additional Excavation - Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
H. Unauthorized Excavation - Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
I. Embankment - The placement and compaction of all suitable materials obtained from excavation or

borrow to raise existing grades.

J. Structures - Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
K. Subgrade - Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
L. Utilities - Underground pipes, conduits, ducts, and cables, as well as underground services within buildings.
M. Rock - Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. (0.76 cu. m) for bulk excavation or 3/4 cu. yd. (0.57 cu. m) for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, or ripping.

    1. For classifying rock excavation in bulk or mass excavations, use a late model, well-maintained tractor-mounted hydraulic ripper equipped with one digging point of standard manufacturer's design sized for use with, and propelled by, a crawler-type tractor with a minimum net flywheel power rating of 370 hp (276 kW), operating in low gear.
    2. For classifying rock excavation in footing, trench, and pit excavations, use a late model, well-maintained, track-mounted hydraulic excavator; equipped with a 42-inch wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom; measured according to SAE J-1179s

1.6 ACTION SUBMITTALS

A. For each type of the following:

    1. Material Test Reports: For each borrow material proposed for fill and backfill as follows:

        a. Source of borrow material
        b. Classification according to ASTM D-2487
        c. Laboratory Compaction curve according to ASTM D-698
        d. Liquid Limit (LL)
        e. Plastic Limit (PI)
        f. Gradation

B. Geotextiles
C. Controlled Low-Strength Material, including design mixture
D. Warning tapes

1.7 INFORMATIONAL SUBMITTALS

A. Photograph, video, or both the existing trees and plantings, adjoining construction, roadways, utilities, and site improvements to establish preconstruction conditions. Identify preexisting damage to trees, plantings, adjoining construction, pavements, sidewalks, and other site improvements. Include plans and notations to identify and describe any such conditions.

1.8 DELIVERY, STORAGE, AND HANDLING

A. See Execution.

1.9 QUALITY ASSURANCE

A. PRECONSTRUCTION CONFERENCE

    1. Conduct a preconstruction conference. Subcontractors that will be performing the work shall attend the preconstruction conference. Notify ARCHITECT one week (7 days) prior to the date of the meeting.

B. REGULATORY REQUIREMENTS

    1. All materials and methods shall comply with the requirements of the AHJ.

1.10 PERMITS

A. OWNER has or will make application and pay permit fees for the temporary stormwater erosion control permit(s) for construction activities required by the AHJ's.

1.11 TOPOGRAPHIC SURVEY

A. OWNER has or will perform a survey of the site, stake the property limits, and provide a reference

benchmark elevation.

1.12 EXISTING BUILDING, STRUCTURE, AND UTILITY PROTECTION

A. All existing buildings, structures, pavements, improvements, and utilities designated to remain or not designated to be removed shall be adequately protected from damage that might otherwise occur due to construction operations. Where construction comes near existing buildings, structures, pavements, improvements, utilities or appurtenances, or if it becomes necessary to move services, poles, guy wires, pipelines or other obstructions, CONSTRUCTION MANAGER shall notify and cooperate with the owner of the utility, structure, or appurtenance. The utility lines and other existing structures shown on the plans are for information only and are not guaranteed to be complete or accurate as to location and/or depth. CONSTRUCTION MANAGER shall be liable for damage to any buildings, structures, pavements, improvements, and utilities resulting from the CONSTRUCTION MANAGER's operations. During construction, all fire hydrants, valve boxes, traffic signals, fire or police call boxes and other existing utility controls shall be left intact, unobstructed and accessible unless noted on the plan.

1.13 UNDERGROUND UTILITIES

A. CONSTRUCTION MANAGER shall contact OKIE (811 or 1-800-522-OKIE) prior to construction for locating existing utilities.
B. The underground utilities shown on the Drawings have been located from field survey surface information and existing drawings. ARCHITECT, ENGINEER, and Surveyor make no guarantee that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. The underground utilities are located as accurately as possible from information available; however, ARCHITECT, ENGINEER, and Surveyor further do not guarantee that the underground utilities shown are in the exact location indicated either vertically or horizontally. ARCHITECT, ENGINEER, and Surveyor have not physically located the underground utilities by probing, excavating, hydrovac, or by any other means.
C. CONSTRUCTION MANAGER shall notify all utility companies and governmental agencies who may have utility lines on or about the premises or who may be affected by the construction. Notice shall be given no less than twenty-four hours prior to any work that may interfere with a utility.
D. CONSTRUCTION MANAGER shall satisfy themselves as to the actual existing subsurface conditions, including but not limited to the depth, location and sizes of pipe or conduits of various kinds in place prior to beginning work. Where the exact depth of any utility or obstruction is not shown on a plan, excavation shall be made prior to reaching the obstruction in order to determine adjustments in grade if needed to prevent interference. Redesign to eliminate conflicts may be necessary.

1.14 CONSTRUCTION CONTROL

A. Do not commence work until temporary erosion and sedimentation control measures are in place.
B. CONSTRUCTION MANAGER shall be responsible for properly laying out the work, and for lines and measurements for the work executed under the Contract Documents. Verify the figures shown on the Drawings before ordering any materials and laying out the work, and report errors or inaccuracies in writing to the ARCHITECT before commencing work. The ARCHITECT or his representative will in no case assume the responsibility for laying out the work.
C. Existing survey points other than those shown on the Drawings shall not be considered as acceptable control points unless approved by the ARCHITECT. If approval is secured, CONSTRUCTION MANAGER remains responsible for maintaining them and for their accuracy. Be responsible for preserving all existing iron or metal, and all concrete survey points or monuments for the construction period.

1.15 PROJECT CONDTIONS

A. TRAFFIC

1. Obtain any required Work Zone Permits from the AHJ at least two (2) working days prior to the start of work and/or placing or removing any barricades or modifying existing traffic control devices.
2. CONSTRUCTION MANAGER shall be responsible for erecting and maintaining barricades and other traffic warning devices as necessary around the perimeter of construction and adjacent to any open trenches. Provide and maintain adequate detours around the work under construction. Provide sufficient lights, warning signs, and watchmen for the safety of the public.
3. Any temporary street closure shall be coordinated with and approved by the AHJ. CONSTRUCTION MANAGER shall establish all detour routes while streets are closed during construction. CONSTRUCTION MANAGER shall notify Fire, Police, and EMSA headquarters when any street is temporarily closed.
4. CONSTRUCTION MANAGER is responsible for the prompt replacement and/or repair of all traffic control devices and appurtenances damaged or disturbed due to construction. Any existing traffic signals, signal loops, conduits, cables, and other traffic control devices affected by the work shall be

reset or replaced according to AHJ's specifications. Coordinate the work with the AHJ's traffic department.

B. UTILITY INTERRUPTIONS

1. Do not interrupt any utility serving facilities occupied by Owner or others unless permitted by OWNER and the owner(s) of the utility. Temporary utility service shall be provided for any interruption. Notify OWNER and ARCHITECT one week (7 days) in advance of proposed interruption of utility.

C. SUBSURFACE CONDITIONS

1. A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from the data.

D. EXCAVATION AND TRENCH SAFETY SYSTEMS

1. CONSTRUCTION MANAGER shall be responsible for complying with State laws and Federal regulations relating to excavation and trench safety, including those which may be enacted during the performance under this Contract. CONSTRUCTION MANAGER is advised that Federal Regulations 29 C.F.R. 1926.650-1926.652 have been, in their most recent version as amended, in effect since January 2, 1990. CONSTRUCTION MANAGER shall fully comply with the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) regulations pertaining to excavations, trenching, and shoring and shall provide and familiarize its employees involved in excavation and trenching with the provisions in OSHA Pamphlet Number 2226, Excavating and Trenching Operations.

1.16 HAZARDOUS CONDITIONS

A. If CONSTRUCTION MANAGER encounters a Hazardous Environmental Condition or if CONSTRUCTION MANAGER or anyone for whom CONSTRUCTION MANAGER is responsible creates a Hazardous Environmental Condition, CONSTRUCTION MANAGER shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency); and (iii) notify OWNER and ARCHITECT (and promptly thereafter confirm such notice in writing). OWNER shall promptly consult with ARCHITECT concerning the necessity for OWNER to retain a qualified expert to evaluate such condition or take corrective action, if any.

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. Excavating and grading equipment shall be approved types and designs and shall be maintained in first class condition. Equipment used for disposing of excavated materials outside of the limits of the work shall be such as will avoid scattering or wasting material along the line of haul.

2.2 MATERIALS

A. Provide borrow materials when sufficient satisfactory soil materials are not available from excavations.
B. Satisfactory Soils –

1. On-Site Soils and Imported Fill -

a. Soil Classification Groups GC, SC, SW or GW according to ASTM D 2487. This soil type is required beneath building footprint (below foundation elements), extending outside perimeter walls a horizontal distance equal to the height of fill embankment. Also acceptable for all other areas/elevations not requiring LVC material.

2. Low Volume Change (LVC) Engineered Fill –

a. Soil Classification Groups CL, GC, or SC according to ASTM D 2487, or a combination of these groups. This soil type is required beneath slabs for a depth of 2-ft, CL materials should be placed above foundation elements only. May be used below foundations if classifying as a GC or SC only. Acceptable for all other areas/elevations outside the building footprint as well. Topsoil strippings or material containing organics shall not be used as LVC material.
b. CL soils containing less than 30 percent gravels may be difficult to establish proper compaction and it may be necessary to limit these materials to non-pavement and non-building areas.

3. On-Site Natural Soils –

a. Soil Classification Groups CH according to ASTM D 2487. This soil type shall not be placed within the upper 2-ft beneath foundations, floor slabs and pavements.

4. Additional requirements for satisfactory soils –

a. Controlled, compacted fill shall consist of approved materials that are free of organic matter and debris and contain maximum rock size of 12 inches, or the lift thickness, whichever is less. Frozen material shall not be used and fill shall not be placed on a frozen subgrade. A sample of each material type shall be submitted to the Geotechnical Engineer for evaluation prior to its use.
b. Low plasticity cohesive soil or granular soil having a liquid limit of less than 50%, contain at least 15% fines retained on the No. 200 sieve, and preapproved by the Geotechnical Engineer.
c. Satisfactory soils shall be free of rock or gravel larger than 12 inches in any dimension or the lift thickness, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups not defined as Satisfactory Soils above, according to ASTM D 2487, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within the required optimum moisture content at the time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
H. Drainage Course: Narrowly graded mixture of washed crushed stone or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.
I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No. 4 sieve.
J. Sand: ASTM C 33; fine aggregate.
K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.3 GEOTEXTILES

A. Geotextiles for Erosion Control

1. Pervious fabric under riprap for slope protection and gabion separation shall meet the requirements of AASHTO M 288, “Permanent Erosion Control Geotextile Requirements.” The fabric shall be a non-woven, needle-punched material constructed of long chain synthetic polymers composed of at least 85 percent polyester, polyolefins or polyamides.
2. The fabric shall meet the following test requirements:

a. Weight: 6 oz. sq/yd, ASTM D 2646
b. Thickness: 70 mils, ASTM D 1777
c. Grab Strength: 180 lbs, ASTM D1682
d. Puncture Strength: 75 lbs, ASTM D 751

1) Tension testing machine with ring clamp, steel ball replaced with a 5/16-inch diameter solid steel cylinder with a hemispherical tip centered within the ring clamp.

e. Burst Strength: 290 psi, ASTM D 751, diaphragm test method
f. Trapezoidal Tear Strength, 50 lbs (either principal direction), ASTM D 1117
g. Ultraviolet Degradation at 150 hours: 70% retained strength, ASTM D 4355
h. E.O.S.: 50-100, USACE Method

B. Geotextiles for Subsurface Drainage Purposes

1. Geotextiles for pipe underdrain and drainage systems shall meet the requirements of AASHTO M

288, “Subsurface Drainage Geotextile Requirements.” Geotextile shall be according to AASHTO M 288, Table 2, with from 15 to 50 percent of in-situ soil passing the No. 200 sieve.

C. Geotextiles for Subgrade Reinforcement

1. Geotextiles for subgrade reinforcement under pavement structures shall meet the requirements of AASHTO M 288, “Stabilization Geotextile Property Requirements.”

D. Geotextiles for Bases

1. Geotextiles used for separation under base courses shall be a non-woven fabric for base course separation in accordance with AASHTO M 288, “Separation Geotextile Property Requirements” with a Class 2 Degree of Survivability.

2.4 CONTROLLED LOW-STRENGTH MATERIAL

A. Controlled Low-Strength Material (CLSM) shall be a self-compacting low strength material with a flowable consistency.

B. CLSM shall be produced from the following materials:

1. Portland Cement: ASTM C 150, Type I.
2. Fly Ash: ASTM C 618, Class C or F.
3. Normal-Weight Aggregate: ASTM C 33, 3/8-inch nominal maximum aggregate size.
4. Foaming Agent: ASTM C 869.
5. Water: ASTM C 94.
6. Air-Entraining Admixture: ASTM C 260.

C. CLSM shall meet the following requirements:

1. Spread diameter of 8 inches or greater according to ASTM D 6103.
2. Minimum strength of 300 psi according to ASTM D 4832 at 28 days after placement.
3. Unit weight of 115 to 145 lb/cu.ft measured at the point of placement according to ASTM D 6023.

2.5 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 EXPLOSIVES

A. Do not use explosives.

3.3 EXCAVATION, GENERAL

A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Geotechnical Engineer.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

a. Intermittent drilling; ram hammering; or ripping of material not classified as rock excavation is

earth excavation.

2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:

   a. 24 inches outside of concrete forms other than at footings.
   b. 12 inches outside of concrete forms at footings.
   c. 6 inches outside of minimum required dimensions of concrete cast against grade.
   d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
   e. 6 inches beneath bottom of concrete slabs-on-grade.
   f. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.

3. If mass rock is encountered, the rock excavation shall be classified and cross sectioned by Geotechnical Engineer. The amount of rock excavation shall be calculated and a cost proposal for the excavation shall be submitted to the Architect for the review of Owner, Architect, and Civil Engineer.

B. Construction Methods

1. All excavation shall be in accordance with the lines, grades and typical sections as shown on the plans or as established by the OWNER. Unless otherwise shown on the plans or established by the OWNER, the excavation shall be made to the subgrade. Where excavation to grades established in the field by the OWNER would terminate in unstable soil, the CONSTRUCTION MANAGER shall remove the unstable soil and backfill to the required grade.
2. Where excavation to grade established in the field by the OWNER terminates in loose or solid rock, the CONSTRUCTION MANAGER shall extend the depth of excavation 6 inches and backfill with select material compacted as required.
3. The CONSTRUCTION MANAGER shall conduct his operation in such a manner that adequate measurements may be taken before any backfill, as required above, is placed.

C. Provisions for Drainage

1. If it is necessary in the execution of the work to interrupt the natural drainage of the surface or the flow of artificial drains, the CONSTRUCTION MANAGER shall provide temporary drainage facilities that shall prevent damage to public or private interest and shall restore the original drains as soon as the work shall permit.
2. The CONSTRUCTION MANAGER shall be held liable for all damages which may result from neglecting to provide for either natural or artificial drainage which his work may have interrupted.

D. Excess Excavation

1. Excavation in excess of that needed for construction shall be disposed of by the CONSTRUCTION MANAGER. In general, suitable excess excavation shall be used in construction of streets, drives, parking lots, widening of embankments, flattening of slopes, etc., but, if it becomes necessary to waste any material, it shall be disposed of in such a manner as to present a neat appearance and to not obstruct proper drainage or cause injury to any street improvements or abutting property. If necessary to haul off excess or unsuitable material, the CONSTRUCTION MANAGER should ask approval of the OWNER as to disposition site and method.

E. The on-site soils typically classify as Type B in accordance with OSHA regulations. Temporary excavations in soils classifying as Type B with a total height of less than 20 ft. shall be cut no steeper than 1H:1V in accordance with OSHA guidelines. Confirmation of soil classification during construction, as well as construction safety (including shoring, if required), shall be the responsibility of the CONSTRUCTION MANAGER.

F. Overburden soils on the site consist of very dense clayey gravels with chert cobbles and boulders with isolated areas consisting of clays with a reduced chert content. The overburden soils are anticipated to be rippable with dozers, but with difficulty. In addition, areas resistant to ripping consisting of large chert boulders, requiring other removal methods (pneumatic breakers or blasting, if allowed) should be anticipated. The Earthwork Contractor shall review the attached boring logs when assessing excavation difficulty at this site. Mass grading at this site is anticipated to occur at a slower rate as compared to sites where overburden soils are primarily fine grained (silts and clays).

G. If relatively chert free fat clay zones are encountered at footing bottom and finish subgrade elevation, they shall be undercut 2 ft., or to gravelly clays/clayey gravels, whichever is shallower, and replaced with LVC

fill material.

3.4 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Pile Foundations: Stop excavations 6 to 12 inches above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. The length of trench excavated approximately to grade shall not exceed one hundred-fifty feet (150-ft) and no trench excavation whatsoever shall be made farther than three hundred feet (300-ft) in advance of completed backfill.

B. Trenches shall be excavated to a width which will provide adequate working space and sidewall clearances for proper pipe installation, joining, and embedment. Stipulated minimum trench widths are not minimum average widths but are minimum widths that shall be required. Stipulated maximum trench widths shall not be exceeded. Trench width shall be the width of the trench excavation measured from bank to bank at the top of the pipe. For rigid pipes, when the maximum trench width is exceeded, the CONSTRUCTION MANAGER shall be required to provide a higher strength pipe or higher bedding classification, singly or in combination as directed by the ARCHITECT, at the CONSTRUCTION MANAGER's expense. Any additional foundation material and/or embedment material required due to over excavation, beyond the maximum trench width shall be at the CONSTRUCTION MANAGER's expense.

C. Where trenches are excavated in soil of such nature as to require sheeting and shoring to assure proper installation, and safety of the workmen and any adjacent structures or other objects, the CONSTRUCTION MANAGER shall provide the necessary sheeting and shoring. Where possible, shields designed to be portable and moved along as work progresses may be used. The contract pay widths shown in the above shall apply to all trenches with or without sheeting or shoring.

D. Excavation shall be made in open-cut from the surface of the ground and shall be made no larger than necessary to permit proper construction of the work in accordance with the plans and specifications. The entire foundation area in the bottom of all excavations shall be firm, stable and of uniform density as nearly as practical, and unless necessary, materials shall not be disturbed below grade. Where trenches are excavated in soft, unsuitable materials, trench bottom may be stabilized by over-excavating unsuitable materials and replaced with engineered fill.

E. Where depth of trenching and other excavations are greater than twenty feet (20'), and when not provided for in the plans, an engineer shall be retained by the CONSTRUCTION MANAGER to design bank protection as per OSHA rules and regulations. The bank protection design, signed and sealed by a Professional Engineer registered in the State of Oklahoma, shall be submitted to the ARCHITECT.

F. The sides of all excavations shall be sufficiently sheeted, shored and braced so as to prevent slides, cave-ins, settlement or movement of the banks. In wet, saturated or flowing ground where it is necessary to install tight sheeting or cofferdams, wood or steel sheet piling of approved design and type shall be used. All sheeting, shoring and bracing shall have sufficient strength and rigidity to withstand the pressures exerted and maintain the walls of the excavation properly in place and protect all persons or property from injury or damage. When excavations are made adjacent to existing buildings or other structures, or in paved streets or alleys, particular care shall be taken to adequately sheet, shore, and brace the sides of the excavation to prevent any undermining of or settlement beneath the structures or the pavement. Underpinning of adjacent structures, when necessary, shall be done in an approved manner. The foundation material that is undermined shall be replaced and compacted in accordance with the requirements of this section. Sheeting, shoring, and bracing shall not be left in place unless otherwise shown on the plans or authorized by the ARCHITECT. The removal of sheeting, shoring and bracing shall

be done in such a manner as not to endanger or damage either the new structure or any existing structure or property, either private or public, and so as to avoid cave-ins or sliding of the banks. If for any reason the CONSTRUCTION MANAGER, with the approval of the ARCHITECT, leaves in place any sheeting, shoring or bracing, no payment will be allowed for such material left in place unless it is classified as a contract pay item. All holes or voids left by the removal of sheeting, shoring or bracing shall be satisfactorily filled and compacted in accordance with the requirements of this section.

3.7 SUBGRADE PREPARATION AND INSPECTION

A. Notify Architect when excavations have reached required subgrade.
B. If unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 25 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

    1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
    2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Owner's materials, testing, and inspections Geotechnical Engineer, and replace with compacted backfill or fill as directed.

D. Once the subgrade has passed proof-rolling, the exposed subgrade shall be scarified to a minimum depth of 8 inches, moisture conditioned, and compacted to the requirements within Compaction of Backfills and Fills.
E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.8 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
B. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 FILL

A. Prior to the placing of any fill, all clearing and grubbing and site preparation shall have been completed. Stump holes or other small excavations within the limits of the embankment shall have been backfilled before commencing the embankment construction. The surface of the ground, including plowed or loosened ground or small ditches or washes, shall be restored to approximately its original slope.
B. Embankments shall be constructed to the established grade and to the shape of the typical section shown on the, plans, and each section shall conform to the detailed sections of slopes. After completion of the embankment, it shall be continuously maintained to its finished section and grade until the project is accepted.
C. Earth embankments shall be constructed in successive horizontal layers, for the full width of specified depth or cross sections; and in such lengths as are suitable for the sprinkling and compaction methods to be used. Each layer of earth embankment shall be uniform as to material, density, and moisture content before beginning compaction. Layers of embankment shall be brought up uniformly on each side of the structure, and special care shall be taken to prevent any wedging action against the structure. For such distances along embankments adjacent to structures where it is impracticable to obtain compaction by rolling, the embankment material shall be placed in layers not exceeding 12 inches in depth of loose material wetted uniformly to the moisture content directed; and shall then be compacted by methods approved by the OWNER, maintaining the required moisture content by additional sprinkling, if necessary, supplemented by such hand work as is necessary to secure a uniform and thoroughly compacted fill, until each layer has been uniformly compacted to the satisfaction of OWNER.
D. Place backfill on subgrades free of mud, frost, snow, or ice.

3.10 UTILITY TRENCH BACKFILL

A. Backfill is that portion of the total trench backfill down to but not including the pipe embedment material. The backfill shall be only material approved by the ARCHITECT consisting of loose earth, free of clods, stones, organic matter, debris or other objectionable materials.
B. All backfilling shall be done in such a manner as not to disturb or injure the pipe or structures over or against which it is being placed. Any pipe or structure injured, damaged or moved from its proper line or grade during backfilling operations shall be opened and repaired and then re-backfilled as herein specified.

C. The top surface or slopes of all backfill shall be neatly graded off where select topsoil, sod or other material is removed and piled separately; such material shall be carefully replaced in a manner satisfactory to the ARCHITECT. The top twelve inches (12-inches) of backfill material shall be of as good quality as the original topsoil that was removed.
D. A clay trench plug shall be constructed at the edge of the building and extend at least 5 feet out from the face. The clay shall have a minimum plasticity index (PI) of 15 and be placed in controlled lifts not exceeding 9 inches in loose thickness. Each lift of clay backfill shall be compacted to at least 95 percent of the material's maximum standard Proctor dry density, ASTM 698, at a minimum moisture content that is above its optimum value.
E. Place backfill on subgrades free of mud, frost, snow, or ice.
F. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
G. Backfill voids with satisfactory soil while removing shoring and bracing.
H. Utility trench backfill material shall be placed in layers not exceeding 6 inches in depth of loose material.
I. Place and compact initial backfill, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.
J. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
K. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.11 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content for CL, SC, GW, and SW soil types; and to within 0 to 4 percent above optimum moisture content for CH soil types.
B. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
C. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content requirements and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
C. Compact backfills and fills to not less than the following percentages of maximum dry unit weight according to ASTM D-698:

1. Building Area – Below Foundation Bearing Elevation –

    a. Six (6) passes (3 each direction) minimum using a self-propelled vibratory compactor with a minimum drum diameter of 48-inches, or 100% Standard Proctor Density (ASTM D698), whichever is applicable.

2. Building Area – Above Foundation Bearing Elevation & Below Floor Slabs

    a. Three (3) passes of the compactor referenced above, or 95% Standard Proctor Density (ASTM D698), whichever is applicable;

3. Pavements, Sidewalks & Exterior Slabs –

    a. Same as Building Area above foundations.

4. Non-Structural Areas –

    a. 90% Standard Proctor Density (ASTM D698).

5. Utility Trenches –

    a. Compact each layer according to the location of the utility, and no less than 95 percent Standard Proctor Density (ASTM D698).

3.13 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:

1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place base course material over subbase course under hot-mix asphalt pavement.
3. Shape subbase course and base course to required crown elevations and cross-slope grades.
4. Place subbase course and base course 6 inches or less in compacted thickness in a single layer.
5. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
6. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 100 percent of maximum dry unit weight according to ASTM D-698.

C. Pavement Shoulders: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D-698.

3.14 PROTECTION

A. Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
B. Repair and reestablish grades to the specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.15 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
C. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

3.16 DEWATERING

A. PERFORMANCE

1. Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.
2. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
3. Prevent surface water from entering excavations by grading, dikes, or other means.
4. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
5. Remove dewatering system when no longer required for construction.

B. PREPARATION

1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.
2. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
3. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
4. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

5. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
6. Provide temporary grading to facilitate dewatering and control of surface water.
7. Monitor dewatering systems continuously.
8. Promptly repair damages to adjacent facilities caused by dewatering.
9. Protect and maintain temporary erosion and sedimentation controls during dewatering operations.

C. INSTALLATION

1. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
2. Space well points or wells at intervals required to provide sufficient dewatering.
3. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.
4. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.
5. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
6. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
7. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
8. Maintain piezometric water level a minimum of 60 inches below surface of excavation.
9. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.
10. Provide standby equipment on site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.
11. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches below overlying construction.
12. Promptly repair damages to adjacent facilities caused by dewatering operations.

3.17 FIELD QUALITY CONTROL

A. OWNER will engage a soil/material's testing and inspection Geotechnical Engineer for the testing requirements within Excavation and Fill. CONSTRUCTION MANAGER shall coordinate and order all testing with OWNER's material's testing laboratory in conjunction with earthwork operations. The results of the tests shall be forwarded to ARCHITECT. The soils laboratory shall determine the suitability of existing site material prior to beginning fill operations.
B. CONSTRUCTION MANAGER shall be responsible for the retesting cost of failed tests.
C. CONSTRUCTION MANAGER shall be responsible for the cost of any and all of CONSTRUCTION MANAGER's internal quality control tests.
D. The soils testing laboratory shall:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements and determine that fill material.
2. Determine that maximum lift thickness comply with requirements.
3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.

E. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
F. Testing agency shall test compaction of soils in place, as applicable. Tests will be performed at the following locations and frequencies:

1. Building Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2,500 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
2. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every

5,000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.

3. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length, but no fewer than two tests.
4. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than two tests.

G. Engineered fill, including scarified compacted subgrade, shall be tested for moisture content and compaction during placement. If in-place density tests indicate the required moisture or compaction limits have not been met, the shall be reworked and retested as required until the required moisture and compaction requirements are met.

H. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; re-compact and retest until specified compaction is obtained.

END OF SECTION

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VOL 01	COVER SHEET	■			■	
G0.01	DRAWING INDEX	■		■	■	■
CIVIL						
C0-101	GENERAL CIVIL NOTES -BP2				■	
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C1-101	EXISTING CONDITIONS				■	
C1-102	EXISTING CONDITIONS				■	
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C1-105	EXISTING CONDITIONS	■				
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C2-101	OVERALL DEMOLITION VIEW				■	
C2-102	A1 DEMOLITION PLAN				■	
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C2-111	NP3 DEMOLITION PLAN	■				
C2-112	NP4 DEMOLITION PLAN	■				
C2-113	NP5 DEMOLITION PLAN	■				
C2-701	EROSION CONTROL PLAN - HOSPITAL				■	
C2-702	NP EROSION CONTROL PLAN	■				
C2-750	EROSION CONTROL DETAILS	■				
C2-751	EROSION CONTROL DETAILS				■	
C3-108	NP SITE PLAN OVERVIEW	■	■			
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C3-111	NP3 SITE PLAN	■	■			
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C3-501	SITE DETAILS	■				
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C9-501	DOWNING DRIVEWAY DETAILS	■				

Grand total: 95

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VOL 07	COVER SHEET	■				
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ELECTRICAL						
ENL.00	ELECTRICAL LEGEND	■				
ENL.01	ELECTRICAL SITE PLAN - NORTH LOT	■				

Grand total: 4

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VOL 09	COVER SHEET	■				
G0.01	DRAWING INDEX	■		■	■	■
TECHNOLOGY						
TNS1.02	NETWORK SITE PLAN - NORTH PARKING & ACCESS	■	■			

Grand total: 3

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10/24/2022

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SEPT. 6, 1839

CHEROKEE NATION REPLACEMENT HOSPITAL

TAHLEQUAH, OKLAHOMA

KEY PLAN:

PROJECT PHASE:

BID PACKAGE 01

(NORTH PARKING AND ACCESS)

REVISIONS

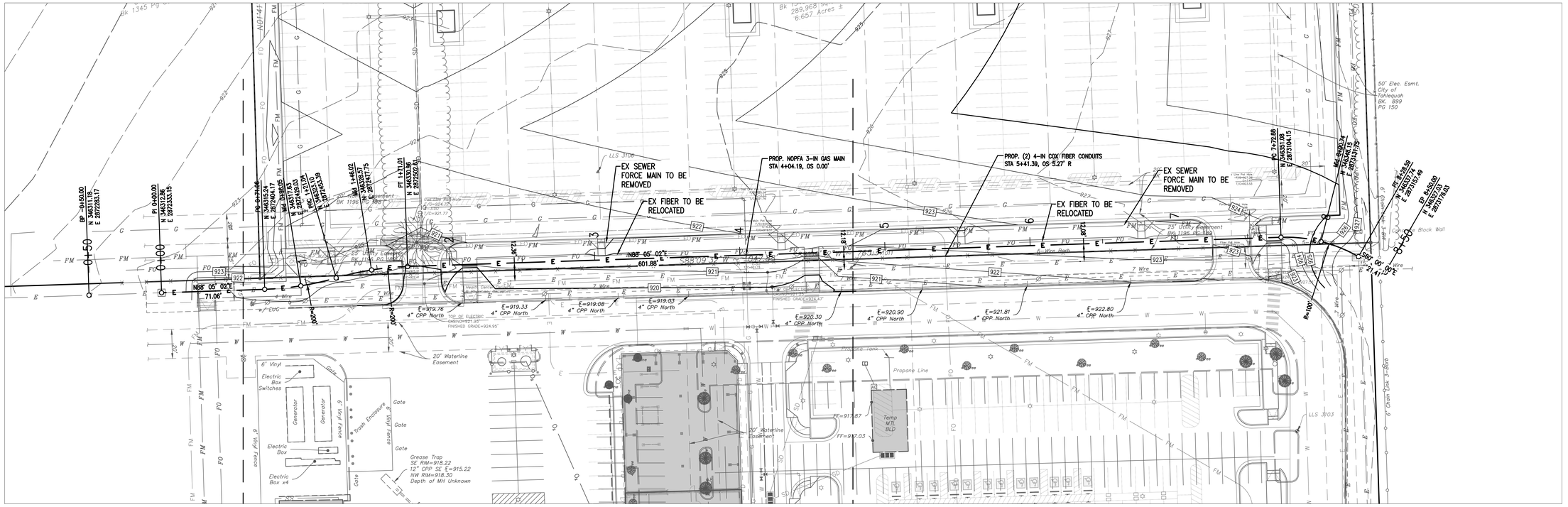
#	DATE:	DESCRIPTION
1	08-17-22	ADDENDUM 01
2	10-07-22	BID PACKAGE 03
3	10-21-22	BID PACKAGE 02
4	10-24-22	ASI 01

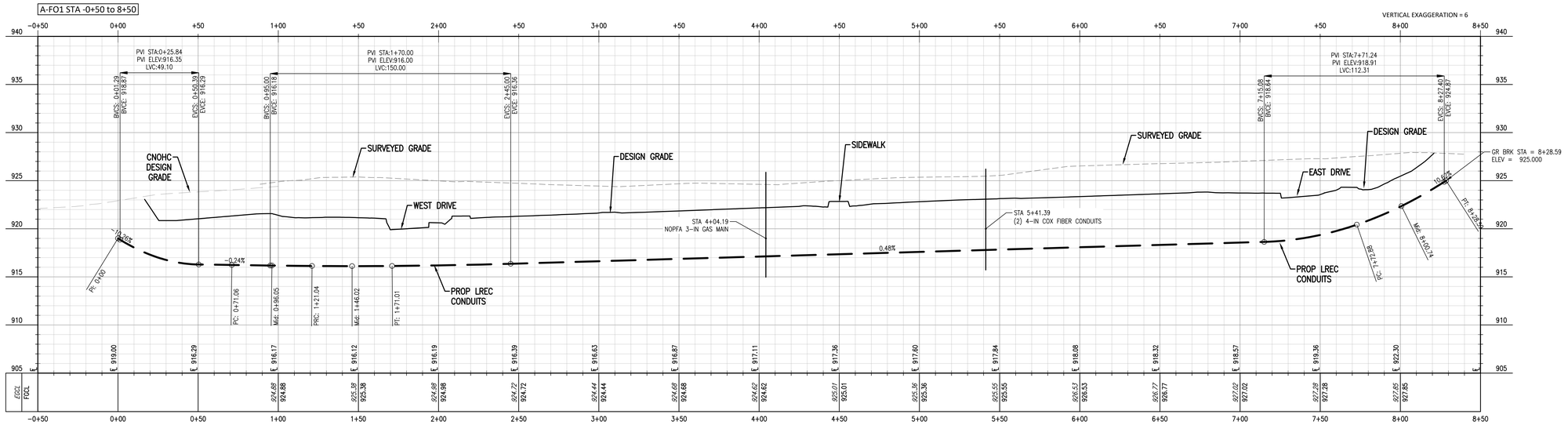
JOB NUMBER: 21-08.21

DATE: 07-29-2022

SHEET NUMBER: **G0.01**

SHEET TITLE: DRAWING INDEX





EXISTING UTILITY LEGEND

- COMMUNICATIONS FIBER — FO
- ELECTRIC OVERHEAD — E
- ELECTRIC UNDERGROUND — E
- NATURAL GAS — G
- OXYGEN GAS — O_X
- SEWER — SS
- STORM SEWER — SD
- WATER — W
- FOUNDATION DRAIN — FD

NEW UTILITY LEGEND

- COMMUNICATIONS FIBER — FO
- ELECTRIC OVERHEAD — E
- ELECTRIC UNDERGROUND — E
- NATURAL GAS — G
- OXYGEN GAS — O_X
- SEWER — SS
- STORM SEWER — SD
- WATER — W
- FOUNDATION DRAIN — FD

GENERAL NOTES

1. COORDINATE RELOCATION WITH LREC.
2. CM SHALL PERFORM TRENCHING, EMBEDMENT, AND BACKFILL OF CONDUIT.
3. CM SHALL PROVIDE SAND OR ROCK SCREENINGS FOR PIPE EMBEDMENT AND BACKFILL.
4. LREC SHALL PROVIDE MATERIALS AND INSTALLATION OF 3-PHASE POWER AND FIBER.
5. WORK SHALL BE OBSERVED, INSPECTED, AND ACCEPTED BY LREC UNLESS LREC INDICATES OTHERWISE IN WRITING.

0' 30' 60' 120'

SCALE: 1" = 30'

UTILITY WARNING:
THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM RECORD DOCUMENTS OR FIELD LOCATIONS BY THE OPERATOR. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH THE SURVEYOR DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

UTILITY ELEVATIONS AND SIZES MAY HAVE BEEN MEASURED UNDER ADVERSE FIELD CONDITIONS. UPON EXPOSING THE UTILITY, ELEVATIONS AND LINE SIZES SHOULD BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR SHOULD VERIFY CRITICAL ELEVATIONS USING THE BENCHMARK PROVIDED BY THE SURVEYOR OR ENGINEER. ANY DISCREPANCIES SHOULD BE IMMEDIATELY BROUGHT TO THE ENGINEER'S AND SURVEYOR'S ATTENTION.

BEFORE YOU DIG
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TAHLEQUAH, OKLAHOMA

KEY PLAN:

PROJECT PHASE:
BID PACKAGE 01
(NORTH PARKING AND ACCESS)

REVISIONS

#	DATE	DESCRIPTION
1	10-24-22	ASI 01

JOB NUMBER: 21-08.21
DATE: 10-24-2022
SHEET NUMBER: **C4-201**
SHEET TITLE: LREC RELOCATION PLAN AND PROFILE

10/21/2022 A:\2021\5123.21\03_DSGN\01_DWG\050_CIVIL\C4-UTIL-LREC-5123.DWG