

CITY OF RALEIGH - ADVERTISEMENT FOR INFORMAL BIDS

POSTED: JULY 1, 2026

CITY PROJECT

NUMBER: 274-ERPRCAMEAS-2026

Project Name: East Raleigh Park and Ride Camera Installation
Project Owner: City of Raleigh – Transportation/Transit
Project Location: 1426 Wilders Grove Lane Raleigh, NC 27604
Project Manager: Sara Tromba (sara.tromba@raleighnc.gov)
Bid Due Date: 5 p.m. Wednesday July 29th, 2026

The City of Raleigh Transit Division invites bids for camera installation at the new East Raleigh Park and Ride facility located at 1426 Wilders Grove Lane Raleigh, NC 27604.

The project scope includes the installation of nine (9) multi-lensed cameras which must have 360 surveillance capabilities located on the property listed above. Please see attached plans for further information. All cameras should follow the City of Raleigh Video Surveillance System Specification Standards as outlined in the bid documents below as well as the following milestone licensing information:

The additional Milestone software must also be included, installed, and connections/views verified:

- Milestone XProtect Professional+ Device License for each camera unit (9 total)
- Milestone One year Care Plus for each XProtect Professional+ Device License (9 total)

Note: At the time of this bid solicitation, the project site has not yet entered the construction phase. Construction is anticipated to commence in Fall 2026 and has a schedule of 300 consecutive calendar days from their Notice to Proceed (NTP) until substantial completion. The awarded contractor for this bid solicitation shall coordinate the scheduling of the camera installation with the City of Raleigh Project Manager, Sara Tromba, when the project site is ready for installation. Some coordination with the awarded general contractor and/or subcontractors may be needed prior to security camera installation.

Deadline for Questions: Questions must be submitted via email by Friday, July 17th, 2026, by 12 p.m. noon to Sara Tromba, the project manager for the City of Raleigh. See contact information above and below to submit questions. If any questions are submitted, an addendum will be posted no later than Wednesday July 22nd, 2026, by 5 p.m.

Informal Bids will be received electronically by email at the address below until 5 p.m. Wednesday, July 29th, 2026. Please see instructions to Bidders for preparation and submission of Bid.

Sara Tromba
sara.tromba@raleighnc.gov

Bidders are responsible for submitting one signed copy of the bid proposal by email prior to 5 p.m. on Wednesday, July 29th, 2026.

No bid may be withdrawn for sixty (60) days after the scheduled closing time for bids.

The City reserved the right to reject any or all bids and to waive informalities.

Bidders will be required to show evidence that they are licensed to perform the work in the Bidding Documents as required by North Carolina General Statute, Chapter 87.

This project involves Federal funding and is subject to requirements of Federal funded projects, including Davis-Bacon compliance and Buy America provisions. This project requires Davis-Bacon compliance, prevailing wage rates are attached. Note, the minimum wage rate shall be at least \$13.30/hr.

Bidders are required to be registered with SAM (System for Award Management) at SAM.gov.

BID SUBMITTAL CHECKLIST

Complete sets of Bidding Documents shall be used in preparing bids; the City assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents. Each Bid shall be prepared on the Proposal Form provided in the Bid Documents.

The following items are required to be submitted as part of each Bid Submittal:

- ☐ **Bid Proposal Form**
 - ☐ Proposal Form with Base Bid, Alternates, and Owner's Contingency
 - ☐ General and Subcontractor Names and License Numbers
 - ☐ Acknowledgement of Receipt of Addenda
 - ☐ Proposal Signature Page
 - ☐ Bidder Qualifications
 - ☐ Additional Bidders Certification
 - ☐ Contractor's Performance Policy Resolution
 - ☐ **Bidders Safety Evaluation Questionnaire**
 - ☐ **Signed Federal Attachments A, B, C, D**
 - ☐ **Completed List of subcontractors/Suppliers Form A and Form B**
 - ☐ **A screenshot of your company's SAM.gov registration**
 - ☐ Registration instructions are attached
-

NOTES REGARDING THE SUBMISSION OF BIDS

1. Each Bid shall be e-mailed to: Sara Tromba, sara.tromba@raleighnc.gov

Bid for East Raleigh Park and Ride Camera Installation

Bidder's Name: _____

Contractor License Number: _____

Address: _____

END OF SUBMITTAL CHECKLIST

CITY OF RALEIGH – BID PROPOSAL FORM
East Raleigh Park and Ride Camera Installation

PROJECT #274-ERPRCAMEAS-2026

City of Raleigh
Project Manager: Sara Tromba
Transportation/Transit
510 West Martin Street, Suite 200
Raleigh, NC 27601

Date: Thursday, July 1st, 2026

The undersigned bidder has carefully examined the Form of Contract, the Form of Contract Bonds, the General Conditions, the Supplemental Conditions, the Plans and Specifications, all of which are acknowledged to be part of the proposal and Proposal Form, and the Bidder has also carefully examined the site of the proposed work. The undersigned further agrees to sign a Contract for the work, if offered within forty-five (45) days after receipt of Bids, and to furnish surety as specified, upon failure to do so, agrees to forfeit to the Owner, attached Bid Bond in the amount of 5% of the bid if it exceeds \$100,000. The Bidder further agrees to provide and furnish all necessary materials, equipment, machinery, and labor necessary to complete the construction of the work in full, in complete accordance with the plans and specifications and the contract documents to the full and entire satisfaction of the City of Raleigh and in accordance with these documents within the time and limit specified below:

In addition to all other agreements and assurances, the undersigned Bidder understands and hereby agrees as follows:

1. The Bidder represents and agrees to complete the entire project in the following number of Consecutive Calendar Days: **365 days** from the date on the Notice to Proceed.
2. The Bidder agrees to comply and coordinate with City of Raleigh personnel and awarded General Contractor for security camera installation through project completion.
3. The Bidder agrees to comply with the City's policy regarding the updated **USDOT DBE Interim Final Rule** program updates.
 - a. On Oct. 3, 2025, the United States Department of Transportation (USDOT) published an Interim Final Rule (IFR) in the Federal Register modifying the eligibility requirements for participation in the Disadvantaged Business Enterprise (DBE) program. Furthermore, the IFR mandates that all currently certified DBEs be reevaluated, and ultimately recertified, for continued program eligibility under these new requirements. 49 C.F.R. § 26.111.
 - b. The Disadvantaged Business Enterprise (DBE) and Airport Concessions Disadvantage Business Enterprise (ACDBE) modifications can be found in the [Federal Register Update](#).
 - c. The IFR and the IFR Frequently Asked Questions (IFR FAQ) issued on October 24, 2025, require GoRaleigh to operate the DBE Program in a constitutionally compliant, nondiscriminatory manner. It eliminates all race- and sex-based presumptions of disadvantage and replaces them with a strictly individualized determination standard. The North Carolina Unified Certification Program (NCUCP) must reevaluate all DBE firms under the new criteria before their eligibility can be confirmed. Until the reevaluation is complete, DBE goals cannot be set on contracts, and no DBE participation may be counted toward any DBE goal.
 - i. Effective immediately, GoRaleigh, Primes and Subrecipients must operate under these new federal requirements.
 - d. DBE IFR Frequency Asked Questions
 - i. https://www.transportation.gov/sites/dot.gov/files/2025-12/DBE%20IFR%20FAQ%27s%20-%20Updated%2012-1-2025_0.pdf

The Bidder agrees to execute the work described and set forth in the Plans and Specifications for the amounts as follows:

Base Bid:

(In written word)

\$

(In numerals)

Owner's Contingency (will be determined by the Owner and added to the base bid)"

(Note that the Owner's Contingency shall only be used when pre-authorized in writing from the City. No mark-up shall be applied to reimbursable expenses.)

Total Bid Proposal:

(in written word)

\$

(In numerals)

Name of General Contractor and License Number: _____

Name of Electrical Contractor and License Number: _____

Name of Plumbing Contractor and License Number: _____

Name of Mechanical Contractor and License Number: _____

GS143-128(d) requires all single prime bidders to identify their subcontractors for the above subdivisions of work. A contractor whose bid is accepted shall not substitute any person as subcontractor in the place of the subcontractor listed in the original bid, except (i) if the listed subcontractor's bid is later determined by the contractor to be non-responsible or non-responsive or the listed subcontractor refuses to enter into a contract for the complete performance of the bid work, or (ii) with the approval of the awarding authority for good cause shown by the contractor.

UNIT PRICES

Unit prices quoted and accepted shall apply throughout the life of the contract, except as otherwise specifically noted. Unit prices shall be applied, as appropriate, to compute the total value of changes to the base bid quantity of the work all in accordance with the contract documents.

Refer to Section 012200 "Unit Prices" for further clarification. N/A.

ALLOWANCES

Include in the base bid proposal the following allowances as specified in Division 01, Section 012100 "Allowances."

Allowance No.1: N/A.

ACKNOWLEDGEMENT OF RECEIPT OF ADDENDA

The undersigned Bidder hereby acknowledges receipt of the following Addenda:

<u>Addendum Number</u>	<u>Dated</u>	<u>Acknowledge Receipt</u> (initial)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please check here if no addenda were received: _____

Acknowledged for: _____
(Name of firm or corporation making bid)

By: _____
(Signature of Authorized Representative)

Name: _____
(Print or Type)

Title: _____

Date: _____

PROPOSAL SIGNATURE PAGE

The bidder is required to furnish surety as specified in the General Conditions. Upon failure to do so, the bidder agrees to forfeit to the Owner the attached cashier's check, certified check, or bid bond in the amount of 5% of the total bid proposal.

The undersigned further agrees in the case of failure on his part to execute the said contract and the bonds within ten (10) consecutive calendar days after being given written notice of the aware of contract, the certified check, cash or bid bond accompanying this bid shall be paid into the funds of the owner's account set aside for the project.

Respectfully submitted this day of _____

By: _____
(Name of firm or corporation making bid)

WITNESS:

By: _____
Signature

(Proprietorship or Partnership)

Name: _____
Print or Type

Title: _____
(Owner/Partner/Pres./V.Pres.)

Address: _____

ATTEST:

By: _____

License No. _____

Title: _____
(Corp. Sec. or Asst. Sec. only)

Federal I.D. No. _____

Email Address: _____

Office Phone Number: _____

(CORPORATE SEAL)

BIDDER QUALIFICATIONS

The Bidder shall furnish the following information; designed to assist the Owner in determining whether or not the Bidder is qualified to perform the work described in the Bid and Contract Documents:

1. List three references with contact person and telephone number who are qualified to objectively judge the results of similar work performed by the bidder in the last three years.

A. _____
Name and Title Telephone Number

Project Title/Description Date of Completion

B. _____
Name and Title Telephone Number

Project Title/Description Date of Completion

C. _____
Name and Title Telephone Number

Project Title/Description Date of Completion

2. List previous contracting experience, including contract dollar amounts:

NOTE: The Bidder shall attach additional sheets of information as needed to provide above requested information.

ADDITIONAL BIDDER'S CERTIFICATION

Acceptance of Terms:

In submitting this Proposal, the undersigned agrees that this Bid will remain in effect for a period of forty-five (45) days following the opening of the Bids, that the undersigned agrees to enter into a Contract with the Owner, if awarded, on the basis of this Proposal, and that the undersigned agrees to complete the work in accordance with the Contract Documents.

Non-Collusion in Bidding:

The Bidder specifically agrees to abide by all applicable provisions of Article 3 of Chapter 133 of the North Carolina General Statutes. By submission of this Bid, each Bidder and each person signing on behalf of any Bidder certifies, and in case of a joint Bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best knowledge and belief:

1. The prices in this Bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other Bidder or to any competitor; and
2. Unless otherwise required by law, the prices quoted in the Bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to opening, directly or indirectly, to any other Bidder or to any competitor; and
3. No attempt has been made or will be made by the Bidder to induce any other person, partnership, or corporation to submit or not to submit a Bid for the purpose of restricting competition.

Type of Business:

The undersigned hereby represents that it is a

(corporation, partnership, or an individual)

If a corporation, the undersigned further represents that it is duly qualified as a corporation under the Laws of the State of North Carolina and it is authorized to do business in this State.

Firm Name

Date

Authorized Signature

Title

Name of Project

Address of Business

Office Telephone Number

CONTRACTOR'S PERFORMANCE POLICY
RESOLUTION NO. (1992) -790

A RESOLUTION TO REGULATE THE PARTICIPATION IN THE CITY CONSTRUCTION PROJECTS BY CONTRACTORS WHO MAY NOT BE CAPABLE OF TIMELY AND PROPER COMPLETION OF CITY PROJECTS.

WHEREAS, The City of Raleigh wishes to minimize cost and inconvenience to the citizenry caused by the failure of contractors to complete projects in a timely manner in accordance with approved project schedules; and

Whereas, North Carolina law allows cities to award bids to responsible bidders and the inability to complete work on time is one indication of a lack of responsibility.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF RALEIGHL

Section 1. That the City Manager may disqualify bidders from participation in bidding and award of contracts for city construction projects based on the following conditions existing simultaneously:

A. The dollar value of the work completed is less than the dollar value of the work which should have been completed on the basis of the contractor's approved progress schedule by more than twenty percent of the current contract amount. The dollar amount of the work completed will be the total estimate to date shown in the latest partial pay estimate. The current contract amount will be the contract estimate plus accumulated overruns and less accumulated underruns shown in the latest partial payment estimate.

B. The percentage of the work completed is less than the percentage of contract time elapsed on the work by more than twenty percent. The percentage or work completed will be the dollar value of the work completed as defined above divided by the current contract amount as defined above. The percentage of contract time elapsed will be the number of calendar days elapsed as shown in the latest partial pay estimate divided by the total contract time in calendar days.

Section 2. The City manager shall not include any late days, which are caused by the City in any of his calculations directed at determining bid status.

Section 3. All City construction project specifications shall contain a specific provision clearly outlining the policies set in this Resolution, including the criteria for determining whether a contractor is behind schedule, and the specifications shall clearly state the City's intent to enforce the provisions of this Resolution.

Section 4. The terms of the Resolution shall apply only to contracts for which the specifications for bidders are issued after the effective date of this Resolution.

Section 5. Any contractor who wishes to contest the decision of the City Manager declaring ineligibility may appeal to the City Council by delivering a notice of appeal to the City Clerk no later than ten days after receipt of the City Manager's decision. The notice of appeal shall clearly set out the reasons why the Contractor believes that the terms of this Resolution have been inappropriately applied or the equitable arguments for not applying this Resolution's terms. When considering an appeal the City Council shall consider, among other things, the report of the City Manager, the notice of appeal, and the contractor's current status on any other current City Contracts and its performance on any contracts to which the contractor and the City have been parties to within the two calendar years immediately preceding the filing of the notice of appeal.

Section 6. Bidders so disqualified shall remain disqualified for any period in which they are still in conflict with the schedule provisions of this section.

Section 7. This Resolution is effective upon adoption Adopted 10/6/92.

SIGNATURE

PRINTED NAME

TITLE

DATE

END OF CITY OF RALEIGH – BID PROPOSAL FORM

Section 28 20 00 – Video Surveillance System

1. Revision History

- a. 7/16/2025
 1. Added preferred camera manufacturer
 2. Removed "Related Work," "Definitions," "Reference Standards," and "Codes" sections due to invalid references.
 3. Created a dedicated section for IP Camera Certifications
 4. Expanded information in "Pre-Construction Submittals" and "Final Submittals"
- b. 03/25/2026
 1. Added Section 2 – Video Surveillance Specification Contractor Summary
 2. Added Milestone Advanced Partner Certification requirement.
 3. Updated Scope
 4. Update Preferred IP Camera Manufacturer and Other – City Approved IP Camera Manufacturer

2. VIDEO SURVEILLANCE SPECIFICATION – CONTRACTOR SUMMARY

Document: 06-Video Surveillance_March26_2026_REV 11.docx

1. System Overview (pp. 1–3)

- Provide complete IP Video Surveillance System including cameras, Milestone VMS, wiring, conduit, terminations.
- City provides: Milestone servers, racks, UPS, workstations, network switches.
- Contractor responsible for: installation, cabling, programming, network coordination, construction penetrations, lift equipment, patch/paint.
- Minimum camera performance: 1080p resolution, 0.01 lux color, 0 lux w/IR.
- Milestone VMS integration required, using **hostnames only**.

2. Pre-Construction Requirements (pp. 4–6)

- Milestone **Solution Design** required before ordering equipment.
 - Mandatory detailed **site survey** w/ COR-IFS + IT; provide Site Survey Report.
 - Submit **project plan** with milestones; review every 2 weeks.
 - Required submittals:
 - Shop drawings including wiring diagrams, rack layouts, labeling.
 - Camera programming parameters (30 days prior).
 - Power load calculations.
 - Product data sheets and manuals.
-

3. Contractor Qualifications (pp. 6–7)

- Must be **Milestone Advanced Partner** certified.
 - Minimum 5 years of IP-based CCTV installation experience.
 - Provide 3 references (similar scope).
 - Must be licensed at time of bid.
 - May subcontract specialized portions only to equally certified subs.
-

4. Approved Camera Manufacturers (p. 7)

- Preferred: **Hanwha**.
 - Also approved: **AXIS, Bosch**.
-

5. Camera Certifications & Standards (pp. 8–10)

- UL/ETL listed, FCC Part 15B, CE, NDAA compliant.
- Environmental ratings: IP66/IP67, NEMA 4/4X, IK10 vandal.
- PoE standards: 802.3af/at/bt.

- ONVIF Profiles S, G, T.
 - Minimum resolution: 1080p; special areas 4MP+.
-

6. Camera Types & Basis of Design (pp. 11–22)

- **Type 1:** 5MP Interior/Exterior Vandal Dome – Hanwha XNV-8080R.
 - **Type 2:** 5MP Interior Vandal Dome – Hanwha QNV-8080R.
 - **Type 3:** 5MP Interior Transaction – QNV-8080R (90-day archive areas).
 - **Type 4:** 20MP Exterior Multisensor – Hanwha PNM-9002VQ.
 - **Type 5:** 4K Interior/Exterior Vandal Dome – Hanwha XNV-9082R.
 - **Type 6:** 4K Exterior Bullet – Hanwha XNO-9082R.
 - All require: motorized varifocal lens, IR, WDR, analytics, onboard storage, smart codec, mobile alignment capability.
-

7. VMS Requirements (pp. 23–28)

- Milestone XProtect Corporate only. No substitutions.
 - Integrates with: Niagra Platform, Vykon Access Control, Exchange email.
 - Must support: adaptive streaming, two stream profiles, motion metadata, event/alarm rules.
 - Required alarm management: Camera Down, Recording Server Down, motion, tamper, analytics.
 - Mapping software: interactive maps, device icons, camera states.
-

8. Storage Requirements (p. 29)

- Minimum retention:
 - General: 31 days.
 - POS/transaction areas: 90 days.
- Automatic cleanup enabled at 31 days.

- Pre/post buffers: 5 seconds.
-

9. Networking Requirements (pp. 30–31)

- Time sync all cameras to COR NTP.
 - Enable QoS for video, audio, events.
 - Cameras configured for multicast; TTL 64.
 - Consistent username + complex password (documented for Owner).
-

10. Conduit, Cabling & Installation (pp. 36–40)

- CAT6 cabling by camera contractor (not by structured cabling vendor).
 - No zip ties—Velcro only.
 - Maintain 2" separation from voice/data cabling.
 - 6-ft service loop in TRs.
 - Support cables every 5 ft; no splices allowed.
 - Fire-stopping required at all penetrations.
 - Exterior cameras require surge protection (see Surge Section).
-

11. Surge Protection Requirements (pp. 32–35)

- PoE surge: Ditek DTK-110C6APOE or DTK-MRJPOEX (outdoor).
 - Non-PoE surge: Ditek DTK-110C6A.
 - Low-voltage AC/DC: Ditek DTK-2MHLP24B.
 - 120VAC power: Ditek DTK-TSS4D.
 - Minimum 36" cable between protector and device.
-

12. Coax/EoC, Power Supplies, Fiber & Solar (pp. 30–35)

- Ethernet over Coax: Veracity Highwire Powerstar.

- Managed 24/28VAC power supplies: Altronix LinQ8PD.
 - Fiber converters: Transition Networks ST multimode models.
 - Solar: Victron Energy only (unless COR-IFS approves alternative).
 - Wireless: Cambium cnVision.
-

13. Execution Requirements (pp. 41–48)

- Camera positioning must be field-verified with Owner.
 - Contractor has restricted local access—not Enterprise server access.
 - Required testing: camera-by-camera walkthrough, recording verification, analytics, alarms.
 - Training: operator + admin training with printed materials.
 - Coordination: 12 hours dedicated for Owner camera positioning support.
-

14. Closeout Requirements (pp. 48–53)

- Required:
 - As-built drawings (COR-IFS template).
 - Milestone configuration backup.
 - Camera aiming reports.
 - Network diagrams, labeling schedule, pole/solar diagrams (if used).
 - Wireless radio configuration details.
 - Final acceptance requires:
 - Training complete
 - Punch list complete
 - As-builts approved.
-

15. Camera Labeling Requirements (p. 50)

- Durable, weather-resistant labels.

- Label both ends of cable.
- Standard format example:
 - CAM-01 – Lobby Entrance – CBL-01 – Port 12.

1. Scope

A. This section describes the general product and execution requirements related to furnishing and installing the project's Video Surveillance System. Requirements shall be understood to be the City of Raleigh's minimum and shall be expanded as necessary to ensure quality.

B. Contractor shall be responsible for providing complete and fully functional system as described in this specification and project drawings.

C. The digital video surveillance system for this project will consist of the following and shall be covered under the Base Bid:

1. IP security camera system (and associated power supplies and media converters if required)
 - a. Minimum Camera Performance Requirements
 - All cameras shall have a minimum resolution of 1080p (1920x1080).
 - All cameras shall include night-vision / low-light capability with minimum low-light performance of 0.01 lux or better (color) and 0 lux with IR illumination.
2. Video Monitoring System (VMS) consisting of Milestone Video Archiver(s) and Milestone Video Monitoring Workstation (City of Raleigh standard)

Responsibility for Server Hardware and Infrastructure

The City of Raleigh shall provide all server hardware associated with the Milestone Video Management System, including but not limited to:

- Milestone Video Archiver servers
- Server rack/cabinet
- Video monitoring workstations
- Network switches required for VMS connectivity
- Uninterruptible Power Supply (UPS) units for all City-provided hardware

3. Construction Coordination Requirements

The Contractor shall be responsible for all construction-related tasks necessary to complete the installation of the security camera system, including but not limited to:

- Core drilling required for cable pathways
 - Patching and painting of any surfaces impacted by installation
 - Roof and wall penetrations, properly sealed according to code
 - Providing lift equipment necessary to access mounting locations
 - Performing after-hours work when required to avoid disruption to building operations
4. Miscellaneous terminations, programming, licenses and updates to extend up to the Owner's final acceptance of the installed security system.
 5. All necessary wiring, cabling, conduit, raceways, data communication circuits, cable trays, firestopping, labor, tools, equipment, licenses and ancillary materials required to furnish and install new security cameras.
 6. Coordinating, configuring, connecting all cameras, video archiver and video monitoring workstations to Owner's network and testing cameras and associated equipment to ensure fully functioning security system integrated with the Owner's existing Milestone Video Management System.
 7. Contractor shall coordinate with the Owner for all specific network standards and for local area network (LAN) connections. All camera integrations into the Milestone VMS must use hostnames rather than IP addresses. All hostnames shall follow the City of Raleigh standard naming convention.
 8. Contractor shall provide all Milestone and camera integration licenses necessary to integrate the Milestone Video Management System into the Owner's Vykon Access Control System. **The Contractor must determine, by obtaining the Owner's requirements, whether VMS integration with the Vykon Security Access System is required for the specific project**
 9. Contractor shall be responsible for coordinating any network, software and hardware equipment needed to connect any device or server to the Owner's network. If any device or server does not meet the Owner's network requirement specification, the Contractor shall be responsible to bring the delinquent device up to the Owner's required specification before connecting the device to the Owner's network.
 10. Installation of the security camera system and providing onsite professional services to assist in the initial setup and programming of all systems to bring components up to fully functioning operational status for acceptance. This shall include but not be limited to:

- a. Determine hardware, software and operations requirements for implementation.
- b. Set up and configure parameters on each camera for recording on the Video Archivers.
- c. Set-up optimum recording parameters on each Video Archiver.
- d. Test video system operations based on a camera-by-camera walkthrough.
- e. Perform end-user training.

11. Warranty and Support Requirements

The Contractor shall provide warranty coverage for all work and materials, including:

- Minimum 1-year workmanship warranty for all installation-related labor and services.
- Minimum 1-year manufacturer warranty for all equipment furnished under this project.
- Firmware and software updates for all installed equipment through the Owner's final acceptance date.
- Maximum 48-hour response time for all warranty-related issues reported by the Owner.

12. Milestone Solution Design Requirement

The Contractor shall develop and submit a complete Milestone Solution Design using the Milestone Solution Designer tool. This design must be submitted to the Owner for review and approval prior to ordering any equipment. The approved design is required as soon as possible to allow the City of Raleigh IT Department to initiate the lease and provisioning process for the VMS Server.

13. Site Survey Requirement

The Contractor shall schedule and conduct a detailed site survey with the Engineering Services Technology Team and City IT. The purpose of this survey is to determine the number of network ports, switch capacity, and any additional infrastructure required to support the complete VMS installation. Upon completion of the site survey, the Contractor shall submit a formal Site Survey Report to the Owner for review and confirmation.

14. Project Plan Submission Requirement

The Contractor shall develop and submit a detailed project plan to the Owner for review and approval. The Engineering Services Technology Team shall review and approve the project plan prior to the start of installation activities. The project plan

shall include a summary of all major milestones required to complete the installation and commissioning of the Milestone VMS solution, including but not limited to:

- Procurement
- Installation
- Network integration
- System testing
- End-user training
- Final system acceptance

The Contractor shall update the project plan throughout the duration of the project and provide revised versions to the Owner whenever major changes occur or upon request. The Contractor shall review the project plan with the Owner every two weeks to ensure alignment, address issues, and confirm progress toward scheduled milestones.

15. Documentation Requirements

The Contractor shall provide complete documentation for the installed Video Management System. All documentation shall be submitted to the Owner for review and acceptance. Required deliverables include, but are not limited to:

- As-built drawings in both PDF and native CAD or Revit format
- Camera aiming reports documenting final field-of-view settings for each camera
- Camera naming conventions aligned with City of Raleigh standards
- Network diagrams showing all switches, VLAN assignments, IP addressing, and device interconnections
- Licensing summary including per-camera licenses, server licenses, integration licenses, and any required Milestone add-ons.

2. Qualifications

- A. The Contractor shall be Milestone System Certified **at least at the Milestone Advanced Partner level** and shall submit evidence of their certification with their bid.
 1. If the Contractor is not properly qualified and certified in a particular system stated in this specification or shown in the project drawings, the Contractor is allowed to sub-contract the work performed on that particular system to a properly qualified and certified Sub-Contractor. This Sub-Contractor shall meet the same Contractor requirements as stated elsewhere in this section, **including being at least Milestone Advanced Partner certified**
- B. Contractor shall supply information attesting to the fact their firm is an authorized product installer / integrator for the proposed system.

- C. Contractor shall supply information attesting to the fact that their installation and service technicians are competent factory trained personnel capable of maintaining the video security system and providing reasonable service time.
 - D. Due to the nature of work involved and the interconnectedness to the City's existing Security Management System, Contractors planning to bid shall have been regularly engaged in the installation and maintenance of IP-based CCTV video, similar in size and scope that outlined herein for a period of no less than five years.
 - E. Contractor shall provide a minimum of three references whose systems' experience are of similar complexity and have been installed and maintained by the security system integrator in the last five (5) years.
 - F. Contractors desiring to bid shall provide the following:
 - 1. Descriptive statement identifying that the Contractor has participated in a prequalification process conducted by the Owner and has been deemed qualified to perform work on any City of Raleigh owned property at the time of bidding.
 - 2. Include an overview of all system components and devices including network communication devices. Provide the manufacturer specifications for each system component to include any applicable software applications required.
 - G. At the time of bidding, Contractors shall be licensed by all appropriate authorities (state, municipal and local) for the type of work to be performed. Contractors who have licenses or permits pending, relevant to this project, shall not be considered acceptable for bidding on this project.
3. Preferred Camera Manufacturer - Hanwha
- A. Commonly used Hanwha cameras for Milestone VMS installations include the XNV-C8083R, QNV-C8083R, PNM-C32083RVQ, XNV-C9083R, and XNO-9083R. These models span the A, P, and Q Series product lines. The A Series provides cost-effective camera and NVR solutions offering essential surveillance functionality, including 2MP and 4MP options with H.265 compression, WiseStream II, 120 dB WDR, Hallway View, IR, and basic analytics. The P Series represents Hanwha's advanced portfolio, utilizing the latest Wisenet 9 AI-powered SoC with dual NPUs to deliver enhanced low-light clarity, extreme WDR, AI noise reduction, forensic search capabilities, and support for cloud-based services such as OnCloud and HealthPro. The Q Series delivers high-resolution imaging up to 8MP with integrated AI analytics for object classification, people counting, and reduced false alarms. It also includes features such as WiseStream III compression, extended tilt angles, Hallway View, and compact micro-vandal camera designs suitable for small to medium installations.

B. Other – City Approved IP Camera Manufacturer

To maintain performance, compatibility, and quality standards, the following are identified as other approved camera manufacturers for this project: **AXIS Communication Inc.** and **Bosch**. Equipment from these approved manufacturers may be submitted as acceptable alternatives, provided they meet or exceed all required technical specifications, functionality, and integration requirements outlined in this document

4. Niagara SYSTEM INTEGRATION REQUIREMENTS

The Video Management System (VMS) shall integrate with the **Niagara Platform** to enable unified visualization, monitoring, and control of video streams within the Niagara graphical user interface.

- a. Ability to view live camera streams within Niagara workbench and browser-based dashboards
- b. Ability to view recorded video clips associated with alarms or events in Niagara.
- c. Integration shall utilize manufacturer-supported drivers or open standards such as **ONVIF, RTSP, or custom Niagara VMS drivers** to establish communication between the VMS and Niagara station.
- d. The Contractor shall confirm compatibility of the proposed VMS system with the City's existing Niagara version (specify e.g. Niagara 4.10 or higher) and shall include all necessary licensing, drivers, or modules to support integration

5. Pre-Construction Submittals

A. Submittals shall be as follows:

1. The contractor shall submit shop drawings for the project. Shop drawings shall include:
 - a. Point-to-point wiring diagrams for the entire system and detailing of each device location and all associated wire runs.
 - b. Provide a separate layout drawing for each equipment room / Drop location. The equipment room layout drawings shall show each component and detail the wiring for all devices connected to all components within the equipment rack.
 - c. Drawings shall also show the labeling of each cable connection point, each wire connected to the connection point and each cable leaving the rack or panel. The layout drawings shall indicate in detail the labeling of each component within the rack or associated panel including, but not limited to, power supplies, terminal strips, switches and Video Archivers.

B. Product data including manufacturer's technical data sheets on each product proposed.

C. Contractor shall submit detailed description of all equipment locations and mounting particulars. The Contractor shall describe coordination efforts that have been made

or need to be made by the Contractor and the Owner for the installation to proceed on schedule in the manner described.

- D. Contractor shall submit complete and detailed programming parameters of all video surveillance equipment to the Owner a minimum of 30 days prior to the development and implementation of the programming.
- E. Contractor shall provide evidence that the power capacity is sufficient for the proper operation of the powered devices under maximum load where AC or DC power supplies are used for Class 1, 2, or 3 Power-Limited Circuits. Detailed calculations of the power requirements shall be acceptable for this purpose.
- F. Manufacturer's User's manuals for operations, administration installation and maintenance.

6. Construction Progress Submittals

- A. The contractor shall provide **construction progress submittals** for all Milestone Video Management System (VMS) installations to ensure compliance with project requirements, facilitate system commissioning, and verify installation milestones. These submittals shall document equipment, configuration, installation progress, testing, and readiness for final acceptance.
- B. Submit a **Construction Progress Submittal Log** indicating all planned submittals with dates aligned to the construction schedule, including:
 - 1. Equipment procurement and delivery dates
 - 2. Camera installation phases
 - 3. Software licensing, installation, and configuration
 - 4. Testing and commissioning dates
- C. Monthly Construction Progress Reports
 - 1. Summary of installation progress
 - 2. Work completed since last report
 - 3. Work planned for the next reporting period
 - 4. Identification of any issues or delays with mitigation plans

7. Closeout Submittals

- A. At project closeout, the contractor shall provide complete documentation and deliverables to ensure proper turnover, operation, and maintenance of the installed Milestone Video Surveillance System.
 - 1. Final As-Built Documentation
 - a. Floor plans showing **final camera locations**, device labels, and IP addresses.
 - b. Exterior Plan showing final camera locations, device labels, and IP addresses
 - c. Device Information Table

- Camera #
- Hostname
- Camera Type
- Views
- MAC Address
- IP Address
- Camera Name
- Telecom Room
- Patch Port
- Switch Port
- d. Riser diagrams indicating:
 - Camera cabling pathways
 - Network switch interconnections
 - Server and storage locations
- e. Wireless Data (Client and Hub Data)
- f. Pole diagrams (Pole Height, Below ground, Above ground, BASE DIA, Rebar Height, Rebar Vert. Spacing, Rebar Horiz. Spacing, Base Volume)
- g. Solar Diagrams
 - Solar Panel
 - Wattage and voltage rating
 - Mounting angle and orientation (e.g. 30° tilt facing true south in Northern Hemisphere)
 - Charge Controller
 - Model and maximum input/output ratings.
 - Connection from solar panel to charge controller
 - Battery
 - Type (AGM, Lithium, Gel), capacity in Ah.
 - Voltage (12V, 24V, 48V) matching system design
 - Power Distribution
 - DC-DC converter if needed (e.g. 24V battery to 12V camera)
 - PoE injector or PoE switch if camera requires Ethernet power
 - Network Connectivity
 - Wireless radio, cellular modem, or fiber/Ethernet uplink
 - Antenna location if using wireless or cellular
 - Grounding
 - Grounding electrode conductor (wire size, type) from pole to ground rod
 - Ground rod location and specifications (length, material, NEC compliance)
 - Calculate **power budget**:
 - Camera average and peak power consumption
 - Total daily energy usage (Wh/day)
 - Required solar array size considering worst-case sun hours
 - Battery storage capacity to maintain operation during consecutive cloudy days (typically 2-3 days autonomy)

- Solar Panel Mounting
 - Bracket type and wind rating
- Battery Enclosure
 - NEMA rating (e.g. NEMA 3R, 4X)
 - Dimensions, mounting location (pole mounted or pad mounted)
- Camera Mount - Pole mount arm detail or direct mounting detail
- Network Communication Diagram
 - Wireless Access Point / Bridge - SSID, encryption type, frequency band (2.4GHz/5GHz).
 - Cellular Modem - Carrier, SIM card location, antenna location
 - Switch Configuration - VLAN and IP addressing if applicable
- Labeling
 - Diagrams should specify labeling requirements for: Solar Panel array, Charge controller, Battery enclosure, Camera ID (matching IP addressing plan)

B. Photo Documentation

1. Photos of installed Milestone recording servers, storage, and workstations
2. Photos showing camera mounting, field of view, conduit installation, and labeling

C. Milestone System Configuration Submittals – Full Milestone Configuration Report

D. Training course materials.

E. Commissioning Test Plan and Check-off List.

8. General Summary

- A. System shall include installation, configuration and integration of IP cameras into a server-based NVR with client stations and storage as described in this section and on the drawings.
- B. The Category 6 cabling to each camera shall be provided by the structured cabling Contractor. Patch cords for the IP cameras to the network switches and from the IP cameras to the data jack shall all be furnished and installed by this Contractor.
- C. System installation shall include, but not be limited to, installation, programming, and configuration of system components as well as all associated software upgrades, patches, and maintenance for the first year.
- D. Contractor is responsible for meeting with Owner's representative at time of camera installation to verify exact placement and view of each camera to ensure coverage area is as intended.

9. Drawing Sheets

- A. All cameras are designated with a CAM symbol on the project drawings. Each camera has a corresponding label of the format “*#-##”.
- B. New Category 6 cabling shall be provided at each camera location.

10. Mounting and Installation

- A. Contractor shall provide the appropriate mounting hardware for all ceiling types and wall types where cameras shall be located.
- B. Wall mounted 180/360 degree or multi-sensor cameras shall be mounted horizontally on a wall arm, gooseneck, parapet, pendant or other similar method.
- C. Exterior building mounted cameras shall be mounted on a wall arm/gooseneck if surface mounting is not possible.
- D. Cameras mounted in lay-in tile or drop ceiling shall have a tile support bridge with a steel support cable connected to structure to prevent tile sagging, theft and vandalism.

11. Code and Standard Requirements

All IP cameras shall be UL or ETL listed, FCC Part 15 Class B compliant, and carry CE marking. Outdoor cameras shall have an ingress protection rating of IP66 or higher and vandal-resistant cameras shall have an IK10 rating. Cameras shall be ONVIF Profile S compliant and support IEEE 802.3af/at PoE standards. NDAA compliance certification shall be provided where required.

- A. Electrical Safety Certifications
 - 1. UL 60950-1 (Information Technology Equipment)
(Older standard, replaced by UL 62368-1 for new products)
 - 2. compliance with North American electrical safety standard
- B. FCC and EMC Compliance
 - 1. FCC Part 15, Subpart B (Class B) - Ensures the device does not cause harmful radio frequency interference in residential and commercial environments.
 - 2. RoHS (Restriction of Hazardous Substances)
- C. Environmental Ratings
 - 1. **IP66 or IP67** for outdoor cameras
 - a. IP66: Dust tight, protected against powerful water jets
 - b. IP67: Dust tight, protected against immersion up to 1m depth
 - 2. NEMA Ratings (US Standard)
 - a. **NEMA 4 or 4X** for corrosion-resistant outdoor enclosures
- D. Network and Interoperability Certifications
 - a. ONVIF Compliance (ONVIF Profile S or better)
 - **ONVIF Profile S, G, or T** depending on functionality (streaming, recording, analytics)
 - b. Ensures interoperability with VMS platforms and other ONVIF-compliant

devices.

- E. IEEE 802.3af / 802.3at / 802.3bt (PoE Standards)
 - a. Verifies Power over Ethernet compliance for compatibility with switches and injectors:
 - 802.3af: PoE (up to 15.4W)
 - 802.3at: PoE+ (up to 25.5W)
 - 802.3bt: PoE++ (up to 60W or 100W depending on Type 3 or Type 4)
- F. IK Rating (Impact Protection) - For vandal-resistant dome cameras
 - a. IK10
- G. All work and materials shall conform in every detail to the rules and requirements of the National Fire Protection Association, National Electric Code and any other codes as required by the Authority Having Jurisdiction.
- H. All materials shall be listed by UL and shall bear the UL label. If UL has no published standards for a particular item, then other national independent testing standards shall apply, and such items shall bear those labels. Where UL has an applicable system listing and label, the entire system shall be so labeled.
- I. Cameras shall meet the following standards:
 - 1. Codes and Standards Compression and Transmission
 - a. ISO/IEC 14496 (MPEG-4) (H.264 / AVC)
 - b. ISO/IEC 23008 (HEVC / H.265)
 - 2. Video Compression
 - a. MPEG-4 (H.264/AVC) or HEVC (H.265)
- J. CAMERA RESOLUTION STANDARDS
 - 1. **Minimum Resolution:** All IP cameras shall provide a **minimum resolution of 1920 x 1080 pixels (Full HD 1080p)** for general surveillance areas unless otherwise noted.
 - 2. **High-Resolution Applications:** For critical areas such as building entrances, license plate capture zones, point of sale (POS), or facial recognition areas, cameras shall have a **minimum resolution of 4 Megapixels (2688 x 1520) or higher**, based on site risk assessment and field of view requirements.
 - 3. The following resolution standards are acceptable based on application:
 - a. Resolution Options

- **HD** (Use Case: Low-traffic hallways, utility rooms)
 - Pixels: 1280/720
 - **Full HD (1080p)** (Use Case: Standard surveillance, offices, corridors)
 - Pixels: 1920 x 1080
 - **4MP**: (Use Case: POS, Entrances, detailed identification zones)
 - Pixels: ~2688 x 1520
 - **5MP**: (Use Case: Outdoor perimeter, wide coverage with clarity)
 - Pixels: ~2592 x 1944
4. Aspect Ratio
 - a. Cameras shall support **16:9 aspect ratio** for compatibility with VMS display standards.
 5. WDR (Wide Dynamic Range)
 - a. Cameras deployed in environments with variable lighting conditions (e.g. entrances, windows) shall support **True WDR of at least 120 dB** to ensure image clarity in both bright and dark areas.

Part 2 - Products

2.1 Quality Assurance

- A. All product materials and equipment shall conform to grade, quality and standards specified. Materials, equipment and software shall be of the most recent version or production design available at the time of installation.

2.2 Approved Manufacturers:

The following manufacturers produce equipment or components which are included in this specification or which are approved for use by the City of Raleigh: (Inclusion on the list below does not imply that all products produced by the manufacturer are acceptable for use in the systems described within this specification.)

1. Altronix
140 58th Street
Brooklyn, NY 11220
2. Bosch Security Systems, LLC
3. Arecont Vision
425 East Colorado Street 7th Floor
Glendale, CA 91205

4. AXIS Communication Inc.
300 Apollo Drive
Chelmsford, MA 01824
5. Dell Inc.
1 Dell Way
Round Rock, Texas 78682
6. Hanwha Techwin America (Samsung)
50 Frank W. Burr Blvd. Suite 43
Teaneck, NJ 07666
7. HP Inc.
1501 Page Mill Road
Palo Alto CA 94304
8. Life Safety Power
750 Tower Road, Unit B
Mundelein, IL 60060
9. Milestone Systems Inc
8905 SW Nimbus Avenue Suite 400
Beaverton, OR 97008
10. Seneca
6040 Tarbell Rd
Syracuse, NY 13206
11. Transition Networks
10900 Red Circle Drive
Minnetonka, MN 55343
12. Veracity USA Inc.
17000 Preston Road, Suite 120
Dallas, TX 75248
13. Ditek Surge Protection
One Ditek Center
1720 Starkey Road
Largo, FL 33771
14. Victron Energy (Solar Equipment)
15. Cambium Networks
3800 Golf Rd, Rolling Meadows, IL 60008

2.3 Video Monitoring System (VMS) General Requirements

- A. The VMS shall support video encoded in MJPEG and H.264 and H.265 compression formats.
- B. The VMS shall synchronize to a common NTP server as the cameras and other security systems.
- C. The VMS shall synchronize with the Owner's Active Directory system and existing Milestone XProtect Corporate VMS.
- D. The VMS shall integrate with the Owner's Niagara Framework.
- E. The VMS shall synchronize with the Owner's Milestone XProtect Corporate management server located in the City's data center.
- F. The VMS system shall support all camera system components connected to the Owner's network whether local or remote and integrate with the existing Niagara based server located in the Engineering Services, Facilities and Operations Management office.
- G. The VMS shall be connected to the Owner's Exchange system for email based notifications.
- H. The Owner shall be able to receive all major and minor software updates at no additional cost for the duration of the project. At the completion of the project the Owner shall have the option to receive a final software update to the latest version before the project is paid in full. All NVRs shall be on a consistent version enterprise wide.
- I. The system shall be licensed for Enterprise installation.
- J. The system shall log all actions on a per user basis, all alarms and notifications on a per device basis and all errors and failures on a per device basis. These logs shall have the ability to be extracted to a document that can be emailed to an administrator.
- K. The NVR software shall launch automatically when operating system is booted and run in the background regardless if a user is logged on.
- L. The administrator shall be able to perform the following actions from the interface:
 - 1. Manage the system licenses.
 - 2. Define the client-to-server communications security settings.
 - 3. Configure the network communications hardware, including connection addresses and ports.

4. Configure mail server SMTP settings and port. The Contractor shall coordinate with the Owner on email accounts to be added.
 5. Configure event and alarm history storage options.
- M. The software shall support the configuration and management of users and user groups. An administrator shall be able to add, delete, or modify a user or user group.
- N. The software shall support partitions and limit what users can view in the configuration database. The administrator shall be allowed to segment a system into multiple security partitions. The Contractor shall coordinate with the Owner on required partitions.
1. A user who is given access to a specific partition shall only be able to view component within that partition.
 2. A user or user group can be assigned administrator rights over the partition.
 3. It shall be possible to specify user and user group privileges on a per partition basis.
- O. The software shall provide the ability to configure key frame (I-Frame) interval.
- P. The software shall have the ability to assign independent pre- and post-alarm recording on a per camera basis.
- Q. The software shall support the configuration of motion detection from the software platform and not through the cameras web interface.
- R. The software shall have the ability to assign motion detection zones on a per camera basis.
- S. The Archiver Recording Server shall have the ability to redirect audio/video streams to active viewing clients on the network using UDP or TCP.
- T. The software shall meet the following alarm management requirements, and the contractor shall be responsible for implementing and demonstrating all alarm management functions to the owner.***
1. Built-in **Alarm Manager** provides centralized monitoring and management of alarms, enabling:
 - a. Viewing live alarms with video verification
 - b. Associating alarms with **camera views** for quick situational awareness
 - c. Assigning alarm priorities and categories
 - d. Linking alarms to **predefined actions (e.g. PTZ preset, send email, activate output relay)**

Server-Side Analytics and Rules (**This functionality shall be deployed for all**

Milestone VMS installations.)

- e. Failure to receive video stream from camera (streaming error)
 - f. Storage issues related to camera recordings
2. Camera-Triggered Alarms
- a. **Motion detection** (using camera onboard analytics)
 - b. Video loss
 - c. Tamper detection
 - d. **Digital input activation** (e.g., dry contact connected to the camera input)
 - e. **Analytics events** (e.g., line crossing, intrusion detection, object left behind) if the camera supports onboard analytics.

3. Recording Server Down Events

4. The contractor shall be responsible for implementing **Recording Server Down Events** within the Milestone VMS. **This functionality shall be deployed for all Milestone VMS installations.**

- a. Alarm Rule Configuration
 - Generate an **alarm** in Alarm Manager when a recording server goes offline
 - Send an **email notification** to administrators when this occurs

5. Camera Down Monitoring

The contractor shall be responsible for implementing camera-down monitoring capabilities within the Milestone VMS. **This functionality shall be deployed for all Milestone VMS installations.**

- a. **Camera down monitoring** refers to the **automatic detection and alarming** when a camera becomes unavailable in the VMS due to:
 - Loss of video stream
 - Network disconnection

U. Manufacturer:

- 1. Milestone: Video Archiver(s) and Milestone Video Monitoring Workstation (City of Raleigh's Standard). No substitutions**

2.4 Network Video Recorder (NVR)

- A. Server NVR's shall be leased through city of Raleigh provider for five years. Include a three-month lead time for lease process to take place for equipment procurement.
- B. The NVR shall be purpose built for surveillance, video optimized storage and

management. The manufacturer shall guarantee performance with the system design at the time of lease.

- C. The NVR shall have a dedicated SSD drive for the operating system and software and an additional spinning drive(s) for video recording and/or Network Storage. The failure of a recording drive shall not affect the operating system drive.
- D. The NVR shall have an integrated DVD-RW drive and digital video output to connect to a KVM.
- E. Each NVR shall synchronize to the City's Active Directory system for user management. The Contractor shall connect this unit directly to the Owner supplied secure network and coordinate with the City's IT Department for connection and IP information.
- F. Contractor shall coordinate with the Owner for the connection of the Milestone equipment into the Owners Vykon system for any remote monitoring and managing. This unit shall be installed, configured, programmed and attached to the network by the Contractor.
- G. The NVR shall be rack mount unless noted otherwise. The contractor shall provide with a 4-post to 2-post converter when installed on a 2-post rack.
- H. The Contractor shall provide a monitor, keyboard and mouse with each NVR. Provide a KVM when the NVR is rack mounted.

I. Video Recording Server Solution Design Proposal

- 1. The Contractor shall provide a **Solution Design Proposal** for the video recording server using the **Milestone XProtect Solution Designer**.
 - 2. The Solution Design Proposal shall be reviewed and approved by the **IFS Milestone Specialist** and the **City of Raleigh IT Department (City IT)**.
 - 3. The City of Raleigh Milestone Specialist and City IT will determine whether **network storage** will be utilized for the Milestone VMS project.
 - 4. The Contractor shall submit the Milestone XProtect Solution Design Proposal for the video recording server **as early as possible** to allow City IT sufficient time to process the lease paperwork and place the lease order. **Failure to submit the proposal in a timely manner may result in project delays due to procurement and processing timelines for the leased server.**
- A. The Milestone Video Archiver shall be configured with the latest version of XProtect Professional + Software.
 - B. The NVR shall not be manufactured by the Contractor or a company the Contractor owns.
 - C. The Contractor shall verify all server calculations with the criteria identified within

these specifications. The Contractor shall also verify existing site conditions and provide the appropriate hardware to mount the NVRs in a secured, professional and workmanship like manner.

2.5 Video Workstation

A. System overview

1. If workstation is called for machine will be on city lease.
2. Contractor shall provide, configure and install a video monitoring workstation within the facility as indicated on the drawings.

B. Workstation shall consist of the following:

1. The workstations shall be a PC computer with Microsoft Windows 10 64-bit operating system minimum by the factory and with a 64-bit processor. The workstations shall require an external monitor, keyboard and mouse for operation.
2. Provide and install the latest version of Milestone XProtect software on the workstation.
3. As a minimum, the workstation shall have at a minimum 500-watt power supply using an 4th Generation Intel i7-4770 processor. Each workstation shall have 16 GB of RAM memory, a 16x DVD +/- RW drive, 6 USB 2.0 ports, a LAN connection 10/100/1000 MB Ethernet card., an onboard VGA Adapter with 128 MB of RAM and additional case fan cooling. The workstations shall be equipped with a PS-2 or USB wheel mouse and 101-key keyboard or shall meet the manufacturers minimum standard.
4. The workstations shall be housed in a mid-height tower. It shall be constructed of steel and plastic materials. It shall also be operated indoors in a temperature range not to exceed 32 to 104° F (0 to 40° C) and a humidity range not to exceed 0 to 95% relative, in a non-condensing atmosphere. The workstations shall employ a Universal Voltage Power Supply requiring 105 - 240 VAC @ 50 - 60 Hz.
5. The workstations shall have a minimum of internal solid-state hard-drive storage of 1TB.
6. The workstation shall have Dual (2) NVIDIA GTX 970 PCI Express 3.0 graphics cards. These graphic cards shall have 4 GB of on board memory and shall support Microsoft Direct X Level 12_1.

C. Environmental Specifications

1. Operating Temperature Range: 32 to 104°F (0 to 40°C).
 - a. Operating Humidity Range: 0 to 95%, non-condensing.

K. Certifications

1. CE
2. UL Listed

L. Monitor

1. Provide one (1) 23" LCD monitor with the workstation.
- M. The LCD monitor shall be a desktop monitor with optimum resolution of 1366 x 768. The viewing area shall be 508mm x 286 mm. The panel aspect ratio shall be 16:9 and support up to 1080i video format.
- G. The monitor shall have front panel controls for power on/off, source/enter, menu/exit, up, down.
- H. An LED indicator shall be located on the front of the monitor for power indication.
 1. Minimum Monitor Electrical Specifications
 - i. Input Voltage: 100 to 240 VAC, 50/60Hz
 - ii. Input Interfaces: S-Video looping, RGB, Component, DVI and HDMI
 - iii. Power Consumption: 110 Watts
 - iv. Viewing Area: 508mm x 286mm.
 - v. Resolution: 1366 x 768.
 - vi. Brightness: 500cd/m2.
 - vii. Contrast Ratio: 700:1.
 - viii. Backlight Type: 6 CCFL.
 - ix. Viewing Angle: 160°/160°.
 - x. Response Time: 8ms
 - xi. Operating Temperature: 32° to 104°F
 - xii. Certifications: CE Class A, FCC Class A, TUV Listed, and C-Tick.
12. Mapping Software (**Contactors shall implement MAP for all VMS installations**)
 - A. The VMS software shall be provided with native integrated mapping software.
 - B. The system shall support **interactive maps** that display cameras, alarms, inputs/outputs, and other integrated devices.
 - C. The system shall allow the import of **JPEG, PNG, BMP, GIF, and PDF files** as background maps.
 - D. Icons representing cameras and devices shall provide **real-time status indications**, such as:
 1. Camera streaming status (online/offline)
 2. Alarm or event states
 - E. Click on camera icons to **view live or recorded video feeds** within the map interface or linked viewing panes.
 - F. The Contractor shall setup all interior maps to include all devices within the system.
 - G. The Contractor shall be responsible to provide all the labor to setup these maps and place all the devices.

- H. The Contractor shall get sign-off from the Owner and Consultant on the finished maps.
- I. The Contractor shall obtain the building plans from the Owner or Design Consultant for their use.

13. Enterprise System Monitor (ESM)

- A. The Contractor shall provide and install ESM software to enable remote management of all NVRs.
- B. The ESM server shall be virtualized on the Owners new virtual machine. Coordinate with the IT department the exact system requirements, virtual machine setup and remote access.
- C. Provide with SQL Express if capable or a full version of SQL Server Standard if the manufacturer requires it.

14. VMS Video Storage

- A. Provide a minimum of thirty-one (31) days and ninety (90) days at point of sale of storage calculated at the following resolution and rates. Provide all hardware, software and configuration needed to accomplish this.

- 1. The system shall be enabled for an automatic video cleanup at 31 days.

- B. Record stream using Unicast RTP/TCP on stream 1.

- C. Pre- and post-record buffer of 5 seconds.

D. Adaptive Streaming

The Contractor shall enable Milestone **adaptive streaming** for live video to dynamically adjust stream resolution and bitrate based on **network conditions and client device capabilities**.

- E. The solution shall support at least **two video stream profiles per camera**:

- 1. **High-resolution stream** (e.g., 1080p, 4K) for **local viewing and forensic storage**.
 - 2. **Low-resolution stream** (e.g., 640p, 480p) for **remote access and mobile viewing**

- F. The VMS shall **automatically switch** between streams based on:

- 1. Available network bandwidth
 - 2. Client display resolution
 - 3. CPU/GPU load of the client device

- G. Adaptive streaming shall be enabled for **remote clients, Smart Client, and Mobile**

App users to reduce network congestion.

- H. Cameras must support **multi-streaming** with **H.264, H.265, or MJPEG**.
- I. Users shall have the ability to **manually override** adaptive streaming settings if needed.

J. Video Stream Specifications

- 1. Video Stream 1:
 - a. Record Stream
 - b. Live Mode: "When needed"
 - c. 30 fps
 - d. 1 keyframe (I-Frame) per second
 - e. Max resolution
 - f. 100% full time recording with motion metadata
 - g. VBR or framerate priority with cap appropriate to resolution and quality
 - h. H.265 (HEVC) or H.264 Main Profile compression
 - i. Smart codec enabled at a medium setting with a dynamic GoP of up to 8 seconds.
 - j. 1024 Mbps per mega pixel data rates (ie 2048 Mbps for a 2mp camera). No bitrate cap when smart codecs are enabled or 8Mbps when no cap is not possible.
 - k. Audio encoding (for cameras with microphones connected or built into them).
- 2. Video Stream 2:
 - a. Default Stream
 - b. Live Mode: "When needed"
 - c. 10 fps
 - d. 1 keyframe (I-Frame) per second
 - e. Resolution: 640x480
 - f. VBR or framerate priority with cap appropriate to resolution and quality
 - g. H.265 (HEVC) or H.264 Main Profile compression
 - h. Smart codec enabled at a medium setting with a dynamic GoP of up to 4 seconds.

- i. 1024 Mbps per mega pixel data rates (ie 2048 Mbps for a 2mp camera). No bitrate cap when smart codecs are enabled or 8Mbps when no cap is not possible.

15. Cameras and Devices

A. General:

1. All cameras and devices shall be time synced to the Owner's NTP server. Coordinate with the Owner to acquire the appropriate NTP address to use.
2. The contractor shall coordinate with the owner for IP addressing, network configuration, QoS and multicast network configuration.
3. The Contractor shall enable QoS on all cameras and intercoms for the video stream, audio stream, event/alarm data, management and metadata at the Owners request.
4. The system shall be configured for multicast. All cameras shall have a multicast Time To Live (TTL) setting of at least 64.
5. The Contractor shall select the appropriate mounting hardware for the situation and confirm with consultant and Owner prior to installation.
6. The Contractor shall select the appropriate mounting hardware for the situation and confirm with consultant and Owner prior to installation.
7. All cameras shall be equipped with remote autofocus or autoback focus with the exception of 180/360 degree cameras and encoded analog cameras.
8. Multi-sensor 180 and 360 cameras shall have each sensor optimally calibrated independently to the conditions.
9. All cameras shall be vandal proof and appropriate for the environment in which it is being installed.
10. All cameras shall have the latest VMS recommended firmware installed and all cameras of the same model shall have matching firmware versions. The Contractor shall provide all necessary firmware upgrades to keep the Owner on the latest version throughout the duration of the project. At the completion of the project the Owner shall have the option to receive a final firmware update the latest version before the project is paid in full. All cameras of the same make and model shall be on the same firmware version.
11. The contractor shall coordinate with the Owner for IP addressing, network configuration and multicast network configuration.
12. All cameras regardless of manufacturer/model shall have a consistent username and non-standard password set. This shall be documented and provided to the Owner and consultant prior to inspections.

13. The camera requirements below represent general performance criteria. Approved equals will have slight differences in specifications. The Owner and Consultant have complete discretion to reject approved equals that stray too far from the minimum requirements.

B. Camera TYPE-1 CAM – Interior/Exterior Overview Low Light / WDR 5MP Vandal Dome IP camera shall be:

1. GENERAL DESCRIPTION

- a. Video Compression and Transmission – The camera shall have the following properties relating to the video signals it produces.
- H.265, H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously
 - H.265 and H.264 – frame rates to maximum 30 fps at all resolution
 - MJPEG – frame rates to maximum 30 fps Maximum frame rates are available at selected resolutions:H.265 and H.264: 30 fps is available at all resolutions. MJPEG: 30 fps is available
 - The camera shall be able to configure up to 10 independent video stream profiles with differing encoding, quality, frame rate, resolution, and bit rate settings.
 - The camera shall be able to configure various resolution selections
 - 16:9 aspect ratio: 2560 x 1440, 1920 x 1080, 1280 x 720, 800 x 448, 640 x 360
 - 4:3 aspect ratio: 2560 x 1920, 1600 x 1200, 1280 x 960, 1024 x 768, 800 x 600, 640 x 480, 320 x 240,
 - 5:4 aspect ratio: 1280 x 1024, 720 x 576,
 - 3:2 aspect ratio: 720 x 480,
 - The camera shall be able to stream at least 10 independent video stream type using unicast protocol
 - The camera shall support multicast and unicast video streaming
 - The camera shall be able to configure Dynamic DNS (DDNS).
 - Smart Codec, Dynamic GOV, and Dynamic fps to efficiently manage bitrate of the video stream.
- b. Camera – The camera device shall have the following physical and performance properties:
- Dustproof, waterproof, and IP67 rated.
 - IK10 rated for protection against impacts.
 - True day/night operation with removable IR cut filter
 - Lens: 3.9 - 9.4 mm (2.4x) motorized varifocal lens
 - Low light level operation to 0.07 lux at F1.3 in color mode and 0 lux in black and white mode with IR LED on.
 - The camera shall support digital noise reduction using both 2D and 3D noise reduction technology
 - Integral IR illumination, providing effective visibility of 50m(164.04ft) at 0 Lux when activated in Black & White mode.

- Configurable a privacy masking regions utilizing a 4 point polygon
- The camera shall provide video display on smart phone (iPhone, Android) to adjust viewing angle, rotation and focus using a direct USB connection and/or Wi-Fi dongle.
- c. Intelligence and Analytics – The camera shall have a suite of integral intelligent operations and analytic functions to include:
 - Motion detection with eight definable detection areas with 8 point polygonal zones, minimum / maximum object size.
 - Detection of logical events of specified conditions from the camera's video input
 - camera tamper (scene change)
 - defocus detection
 - fog detection
 - motion detection with metadata
 - face detection
 - virtual area-based event (intrusion, enter/exit, appear/disappear, loitering)
 - virtual line-based event (directional detection, crossing)
 - Detection of logical events of specified conditions from the camera's audio input
 - sound classification (scream, gunshot, explosion, crashing glass)
 - Interoperability – The camera shall be ONVIF Profile S and G compliant.
 - The camera shall possess the following further characteristics:
 - Built-in web server, accessed via standard browsers including Internet Explorer, Firefox, Chrome & Safari
 - Dual edge recording slot like Micro SD/SDHC/SDXC memory card with configurable pre-alarm and post-alarm recording intervals
 - NAS recording option with configurable pre-alarm and post-alarm recording intervals
 - bi-directional audio
 - Alarms and notifications
 - alarm notification triggers:
 - motion detection
 - tampering detection
 - alarm input
 - defocus detection
 - fog detection
 - face detection
 - audio detection
 - video & audio analytics
 - network disconnection
 - available notification means upon trigger:
 - file upload via FTP and e-mail
 - notification via e-mail

- record to local storage (SD card) or NAS storage
 - external output
 - move to DPTZ preset
 - Pixel Counter available in the web viewer.
 - PoE capable including heater by PoE
2. RECORDING PROFILE: 30day Archive, 15fps @Full Resolution, 35% Motion Events per 24hrs
 3. Basis of Design: Hanwha-Techwin XNV-8080R
 4. Provide flush mount kit and any additional mounting hardware as required for each camera. Mounting hardware shall be approved for plenum ceiling and shall have knock outs for conduit connectivity with no exposed wiring. Provide additional mounting equipment as necessary.
- C. Camera TYPE-2 – Interior Overview 5MP Vandal Dome IP camera shall be:
1. GENERAL DESCRIPTION
 - a. Video Compression and Transmission – The camera shall have the following properties relating to the video signals it produces.
 - H.265, H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously.
 - H.265 and H.264 – maximum of 30fps at all resolution
 - MJPEG – maximum of 15fps
 - The camera shall be able to configure up to 10 independent video stream profiles with differing encoding, quality, frame rate, resolution, and bit rate settings.
 - The camera shall be able to configure various resolution selections.
 - 16:9+ aspect ratio: 2592 x 1464, 800 x 448
 - 16:9 aspect ratio: 1920 x 1080, 1280 x 720, 640 x 360
 - 4:3 aspect ratio: 1280 x 960, 800 x 600, 640 x 480
 - 5:4 aspect ratio: 720 x 576
 - 3:2 aspect ratio: 720 x 480
 - The camera shall support unicast video streaming up to 6 users.
 - The camera shall support multicast video streaming
 - The camera shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.
 - The camera shall provide WiseStream II , Dynamic GOV and Dynamic fps to efficiently manage bit rate of the video stream and reduce storage.
 - b. Camera – The camera device shall have the following physical and performance properties:
 - Dustproof, waterproof, and IP66 rated.
 - IK10+ rated for protection against impacts.
 - True day/night operation with removable IR cut filter
 - Lens: 3.2 - 10.0mm Motorized Vari-focal

- Low light level operation to 0.15 lux at F1.6 in color mode and 0 lux in black and white mode with IR LED on.
 - The camera shall be able to produce clear images in highly contrast scenes with multi-exposure wide dynamic range up to 120dB.
 - The camera shall support digital noise reduction using both 2D and 3D noise reduction technology.
 - The camera shall be able to configure 6 privacy masking areas with rectangles.
 - The camera shall provide video display on smart phone (iPhone, Android) to adjust viewing angle, rotation and focus.
- c. Intelligence and Analytics – The camera shall have a suite of intelligent analytic functions.
- Motion detection with 4 definable detection areas with 4 point polygonal zones, and minimum/maximum object size.
 - Detection of logical events of specified conditions from the camera's video
 - Tampering, Directional Detection, Virtual Line, Enter/Exit
 - Defocus Detection
 - Motion Detection
- d. Interoperability – The camera shall be ONVIF Profile S, G and T compliant.
- e. The camera shall possess the following further characteristics:
- Built-in web server accessed via non-plugin browsers including Google Chrome, IE11, MS Edge, Mozilla Firefox and Apple Safari.
 - Micro SD/SDHC/SDXC memory card with configurable pre-alarm and post-alarm recording intervals
 - NAS recording option with configurable pre-alarm and post-alarm recording intervals
 - Alarms and notifications
 - alarm notification triggers:
 - Alarm input
 - Motion detection
 - Video analytics
 - Network disconnect
 - available notification means upon trigger:
 - File Upload via FTP and E-mail
 - Notification via E-mail
 - Local storage (SD / SDHC / SDXC) or NAS recording at event triggers
 - External output
 - Pixel Counter available in the web viewer.
 - PoE capable including heater by PoE
2. RECORDING PROFILE: 30day Archive, 15fps @Full Resolution, 35% Motion Events per 24hrs
3. Basis of Design: Hanwha-Techwin QNV-8080R
4. Provide flush mount kit and any additional mounting hardware as required for

each camera. Mounting hardware shall be approved for plenum ceiling and shall have knock outs for conduit connectivity with no exposed wiring. Provide additional mounting equipment as necessary.

D. Camera TYPE-3 – Interior Transaction Area 5MP Vandal Dome IP camera shall be:

1. GENERAL DESCRIPTION

- a. Video Compression and Transmission – The camera shall have the following properties relating to the video signals it produces.
 - H.265, H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously.
 - H.265 and H.264 – maximum of 30fps at all resolution
 - MJPEG – maximum of 15fps
 - The camera shall be able to configure up to 10 independent video stream profiles with differing encoding, quality, frame rate, resolution, and bit rate settings.
 - The camera shall be able to configure various resolution selections.
 - 16:9+ aspect ratio: 2592 x 1464, 800 x 448
 - 16:9 aspect ratio: 1920 x 1080, 1280 x 720, 640 x 360
 - 4:3 aspect ratio: 1280 x 960, 800 x 600, 640 x 480
 - 5:4 aspect ratio: 720 x 576
 - 3:2 aspect ratio: 720 x 480
 - The camera shall support unicast video streaming up to 6 users.
 - The camera shall support multicast video streaming
 - The camera shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.
 - The camera shall provide WiseStream II, Dynamic GOV and Dynamic fps to efficiently manage bit rate of the video stream and reduce storage.
- b. Camera – The camera device shall have the following physical and performance properties:
 - Dustproof, waterproof, and IP66 rated.
 - IK10+ rated for protection against impacts.
 - True day/night operation with removable IR cut filter
 - Lens: 3.2 - 10.0mm Motorized Vari-focal
 - Low light level operation to 0.15 lux at F1.6 in color mode and 0 lux in black and white mode with IR LED on.
 - The camera shall be able to produce clear images in highly contrast scenes with multi-exposure wide dynamic range up to 120dB.
 - The camera shall support digital noise reduction using both 2D and 3D noise reduction technology.
 - The camera shall be able to configure 6 privacy masking areas with rectangles.
 - The camera shall provide video display on smart phone (iPhone, Android) to adjust viewing angle, rotation and focus.
- c. Intelligence and Analytics – The camera shall have a suite of intelligent analytic functions.
 - Motion detection with 4 definable detection areas with 4 point polygonal

- zones, and minimum/maximum object size.
 - Detection of logical events of specified conditions from the camera's video
 - Tampering, Directional Detection, Virtual Line, Enter/Exit
 - Defocus Detection
 - Motion Detection
 - d. Interoperability – The camera shall be ONVIF Profile S, G and T compliant.
 - e. The camera shall possess the following further characteristics:
 - Built-in web server accessed via non-plugin browsers including Google Chrome, IE11, MS Edge, Mozilla Firefox and Apple Safari.
 - Micro SD/SDHC/SDXC memory card with configurable pre-alarm and post-alarm recording intervals
 - NAS recording option with configurable pre-alarm and post-alarm recording intervals
 - Alarms and notifications
 - alarm notification triggers:
 - Alarm input
 - Motion detection
 - Video analytics
 - Network disconnect
 - available notification means upon trigger:
 - File Upload via FTP and E-mail
 - Notification via E-mail
 - Local storage (SD / SDHC / SDXC) or NAS recording at event triggers
 - External output
 - Pixel Counter available in the web viewer.
 - PoE capable including heater by PoE
2. RECORDING PROFILE: 90day Archive, 15fps @Full Resolution, 35% Motion Events per 24hrs
3. Basis of Design: Hanwha-Techwin QNV-8080R
4. Provide flush mount kit and any additional mounting hardware as required for each camera. Mounting hardware shall be approved for plenum ceiling and shall have knock outs for conduit connectivity with no exposed wiring. Provide additional mounting equipment as necessary.
- E. Camera TYPE-4 – Exterior Multi-Sensor 20MP Vandal Dome IP camera shall be:
1. GENERAL DESCRIPTION
 - a. The camera shall provide multi directional view and produce video in various view mode.
 - b. The lenses(2M/5M) shall be selectable depending on customer's requirement at site.
 - c. Hallway view is available on CH1/2/3/4.
 - d. Each Channels support SD Card
 - e. It provides one single power supply for all of multi-channels

- f. Video Compression and Transmission – The multi-directional camera shall have the following properties relating to the video signals it produces.
- H.265, H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously
 - H.265 and H.264 [5MP] frame rates to max 30fps (60Hz) / 25fps(50Hz) at all resolution[2MP] frame rates to max 60fps (60Hz) / 50fps(50Hz) at all resolution
 - MJPEG – frame rates to maximum 30fps (60Hz) / 25fps (50Hz) at all resolution
 - The multi-directional camera shall be able to configure up to 10 independent video stream profiles with differing encoding, quality, frame rate, resolution, bit rate, and other video settings.
 - The multi-directional camera shall have four lenses and each lens shall provide the following resolutions.
 - [5MP] 2560x1920, 2560x1440, 1920x1080, 1600x1200, 1280x1024, 1280x960,1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 320x240
 - The camera shall support unicast video streaming up to 20 users.
 - The camera shall support multicast video streaming up to 10 profiles.
 - The camera shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.
 - The camera shall provide WiseStream II , Dynamic GOV and Dynamic fps to efficiently manage bit rate of the video stream and reduce storage.
- g. Camera – The multi-directional camera device shall have the following physical and performance properties:
- IK10 rated for protection against impacts.
 - Lens model:
 - SLA-5M3700Q(3.7mm Zoom Ratio)
 - SLA-5M4600Q(4.6mm Zoom Ratio)
 - SLA-5M7000Q(7.0mm Zoom Ratio)
 - IP66 for protection against dust and water.
 - The multi-directional camera shall be able to capture high contrast scenes with 150 dB for 2MP and 120dB for 5MP multi-exposure wide dynamic range.
 - The camera shall support digital noise reduction using both 2D and 3D noise reduction technology.
 - 32 privacy masking regions utilizing polygons
 - Supporting digital image stabilization the camera shall be able to measure movements in three axes and accurately enhance images from distortions caused by instability.
- h. Intelligence and Analytics – The multi-directional camera shall have a suite of integral intelligent operations and analytic functions to include:
- Motion detection with 8 definable detection areas with 8 point polygonal zones, and minimum/maximum object size.
 - Detection of logical events of specified conditions from the camera's video
 - Defocus detection

- Fog detection
 - Directional detection
 - Motion detection
 - Appear/Disappear
 - Enter/Exit
 - Loitering
 - Tampering
 - Virtual line
 - Face detection
- i. Interoperability – The camera shall be ONVIF Profile S and T compliant.
 - j. The multi-directional camera shall possess the following further characteristics:
 - Built-in web server, accessed via standard browsers including Internet Explorer, Firefox, Chrome & Safari
 - Micro SD/SDHC/SDXC memory card options, with configurable pre-alarm and post-alarm recording intervals
 - Alarms and notifications
 - alarm notification triggers:
 - Analytics
 - Network disconnect
 - available notification means upon trigger:
 - File Upload via FTP and E-mail
 - Notification via E-mail
 - Local storage (SD / SDHC / SDXC) or NAS recording at event triggers
 - Pixel Counter available in the web viewer.
 - PoE+ capable
 - This device has been verified using STP cable. The use of appropriate GND grounding and STP cable is recommended to effectively protect your product and property from transient voltage, thunderstroke, communication interruption.
2. RECORDING PROFILE: 30day Archive, 15fps @Full Resolution, 35% Motion Events per 24hrs
 3. Basis of Design: Hanwha-Techwin PNM-9002VQ
 4. Provide wall mount and/or corner mount kit and any additional mounting hardware as required for each camera. Mounting hardware shall have knock outs for conduit connectivity with no exposed wiring. Provide additional mounting equipment as necessary.
- F. Camera TYPE-5 – Interior/Exterior Overview 4K Vandal Dome IP camera shall be:
1. GENERAL DESCRIPTION
 - a. Video Compression and Transmission – The camera shall have the following properties relating to the video signals it produces.
 - H.265, H.264 and MJPEG compression, each derived from a dedicated

- encoder and capable of being streamed independently and simultaneously.
 - H.265 and H.264 – maximum of 30/25fps(60Hz/50Hz) at all resolution
 - MJPEG – maximum of 15/12fps(60Hz/50Hz)
- The camera shall be able to configure up to 10 independent video stream profiles with differing encoding, quality, frame rate, resolution, and bit rate settings.
- The camera shall be able to configure various resolution selections.
 - 16:9 aspect ratio: 3840x2160, 3328x1872, 3072x1728, 2688x1520, 1920x1080, 1280x720, 800x448, 640x360
 - 4:3 aspect ratio: 2592x1944, 1600x1200, 1280x960, 1024x768, 800x600, 640x480, 320x240
 - 5:4 aspect ratio: 1280x1024, 720x576
 - 3:2 aspect ratio: 720x480
- The camera shall support unicast video streaming up to 20 users.
- The camera shall support multicast video streaming up to 10 profiles.
- The camera shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.
- The camera shall provide WiseStream II, Dynamic GOV and Dynamic fps to efficiently manage bit rate of the video stream and reduce storage.
- b. Camera – The camera device shall have the following physical and performance properties:
 - IK10+ rated for protection against impacts.
 - True day/night operation with scheduling and options for external devices.
 - Lens: 2.8-8.4mm motorized varifocal
 - Low light level operation to 0.05 lux at F1.2 in color mode and 0 lux in IR mode.
 - The camera shall be able to produce clear images in highly contrast scenes with multi-exposure wide dynamic range.
 - The camera shall support digital noise reduction using both 2D and 3D noise reduction technology.
 - The camera shall be able to configure 32 privacy masking areas with polygonal zones.
 - The camera shall have the defog feature to remove foggiess of scene which can be triggered automatically from the fog detection event.
 - The camera shall provide video display on smart phone (iPhone, Android) to adjust viewing angle, rotation and focus.
- c. Intelligence and Analytics – The camera shall have a suite of intelligent analytic functions.
 - Motion detection with 8 definable detection areas with 8 point polygonal zones, and minimum/maximum object size.
 - Motion detection hand-over to PTZ cameras. The camera shall be able to call a preset of PTZ camera when motion event is triggered.
 - Detection of logical events of specified conditions from the camera's video
 - Defocus detection
 - Directional detection

- Motion detection
- Digital auto tracking
- Appear/Disappear
- Enter/Exit
- Loitering
- Tampering
- Virtual line
- Audio detection
- Sound classification
- Shock detection
- Face/upper body detection
- Fog detection
- Business Intelligence features
 - People counting
 - Queue management
 - Heatmap
- Detection and classification of the following sound.
 - Scream
 - Gunshot
 - Explosion
 - Crashing glass
- Interoperability – The camera shall be ONVIF Profile S / G and T compliant.
- The camera shall possess the following further characteristics:
 - Built-in web server, accessed via non-plugin browsers including Google Chrome, MS Edge, Mozilla Firefox and Apple Safari.
 - The camera shall provide streaming to multiple smart phones with DDNS provided freely from the manufacturer. In addition, the application shall be available for both iOS and Adroid, free of charge with search keyword, 'Wisenet Mobile'.
 - Micro SD/SDHC/SDXC memory card with configurable pre-alarm and post-alarm recording intervals
 - NAS recording option with configurable pre-alarm and post-alarm recording intervals
 - Alarms and notifications
 - alarm notification triggers:
 - Analytics
 - Network disconnect
 - Alarm input
 - available notification means upon trigger:
 - File Upload via FTP and E-mail
 - Notification via E-mail
 - Local storage (SD / SDHC / SDXC) or NAS recording at event triggers
 - Alarm output
 - PTZ preset
 - Handover

- Audio playback
 - Pixel Counter available in the web viewer.
 - PoE capable
 - IP66/IP67/IP6K9K, IK10+, NEMA4X
 - This device has been verified using STP cable. The use of appropriate GND grounding and STP cable is recommended to effectively protect your product and property from transient voltage, thunderstrike, communication interruption.
2. RECORDING PROFILE: 30day Archive, 15fps @ Full Resolution, 35% Motion Events per 24hrs
 3. Basis of design: Hanwha-Techwin XNV-9082R
 4. Provide wall mount and any additional mounting hardware as required for each camera. Mounting hardware shall have knock outs for conduit connectivity with no exposed wiring. Provide additional mounting equipment as necessary.
- G. Camera TYPE-6 – Exterior Overview 4K Bullet IP camera shall be:
1. GENERAL DESCRIPTION
 - a. Video Compression and Transmission – The camera shall have the following properties relating to the video signals it produces.
 - H.265, H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously.
 - H.265 and H.264 – maximum of 30/25fps(60Hz/50Hz) at all resolution
 - MJPEG – maximum of 15/12fps(60Hz/50Hz)
 - The camera shall be able to configure up to 10 independent video stream profiles with differing encoding, quality, frame rate, resolution, and bit rate settings.
 -
 - The camera shall be able to configure various resolution selections.
 - 16:9 aspect ratio: 3840x2160, 3328x1872, 3072x1728, 2688x1520, 1920x1080, 1280x720, 800x448, 640x360
 - 4:3 aspect ratio: 2592x1944, 1600x1200, 1280x960, 1024x768, 800x600, 640x480, 320x240
 - 5:4 aspect ratio: 1280x1024, 720x576
 - 3:2 aspect ratio: 720x480
 - The camera shall support unicast video streaming up to 20 users.
 - The camera shall support multicast video streaming up to 10 profiles.

- The camera shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.
- The camera shall provide WiseStream II, Dynamic GOV and Dynamic fps to efficiently manage bit rate of the video stream and reduce storage.
- b. Camera – The camera device shall have the following physical and performance properties:
 - IK10 rated for protection against impacts.
 - True day/night operation with scheduling and options for external devices.
 - Low light level operation to 0.05 lux at F1.2 in color mode and 0 lux in IR mode.
 - Lens: 2.8~8.4mm(3x) motorized varifocal
 - The camera shall be able to produce clear images in highly contrast scenes with multi-exposure wide dynamic range.
 - The camera shall support digital noise reduction using both 2D and 3D noise reduction technology.
 - The camera shall be able to configure 32 privacy masking areas with polygonal zones.
 - The camera shall have the defog feature to remove fogginess of scene which can be triggered automatically from the fog detection event.
 - The camera shall provide video display on smart phone (iPhone, Android) to adjust viewing angle, rotation and focus.
- c. Intelligence and Analytics – The camera shall have a suite of intelligent analytic functions.
 - Motion detection with 8 definable detection areas with 8 point polygonal zones, and minimum/maximum object size.
 - Motion detection hand-over to PTZ cameras. The camera shall be able to call a preset of PTZ camera when motion event is triggered.
 - Detection of logical events of specified conditions from the camera's video
 - Defocus detection
 - Directional detection
 - Motion detection
 - Digital auto tracking
 - Appear/Disappear
 - Enter/Exit
 - Loitering
 - Tampering

- Virtual line
 - Audio detection
 - Sound classification
 - Shock detection
 - Face/upper body detection
 - Fog detection
 - Business Intelligence features
 - People counting
 - Queue management
 - Heatmap
 - Detection and classification of the following sound.
 - Scream
 - Gunshot
 - Explosion
 - Crashing glass
- d. Interoperability – The camera shall be ONVIF Profile S / G and T compliant.
- e. The camera shall possess the following further characteristics:
- Built-in web server accessed via non-plugin browsers including Google Chrome, MS Edge, Mozilla Firefox and Apple Safari.
 - The camera shall provide streaming to multiple smart phones with DDNS provided freely from the manufacturer. In addition, the application shall be available for both iOS and Adroid, free of charge with search keyword, 'Wisenet Mobile'.
 - Micro SD/SDHC/SDXC memory card with configurable pre-alarm and post-alarm recording intervals
 - NAS recording option with configurable pre-alarm and post-alarm recording intervals
 - Alarms and notifications
 - alarm notification triggers:
 - Analytics
 - Network disconnect
 - Alarm input
 - available notification means upon trigger:
 - File Upload via FTP and E-mail

- Notification via E-mail
 - Local storage (SD / SDHC / SDXC) or NAS recording at event triggers
 - Alarm output
 - PTZ preset
 - Handover
 - Audio playback
 - Pixel Counter available in the web viewer.
 - PoE capable
 - IP66/IP67, IK10, NEMA4X
2. RECORDING PROFILE: 30day Archive, 15fps @ Full Resolution, 35% Motion Events per 24hrs
 3. Basis of design: Hanwha-Techwin XNO-9082R
 4. Provide wall mount and any additional mounting hardware as required for each camera. Mounting hardware shall have knock outs for conduit connectivity with no exposed wiring. Provide additional mounting equipment as necessary
16. Ethernet with PoE Over 75 Ohm Coaxial Cable
- A. The contractor shall provide an Ethernet over coaxial cable converter for any camera mounted in an area without local power supply availability or at other locations as required.
 - B. Each camera shall receive its own dedicated transmitter and receiver unit. Splitting multiple cameras through a single Tx/Rx pair is not allowed.
 - C. The Contractor shall coordinate with the Elevator Contractor for installation as required.
 - D. Shall support multi-cast networks.
 - E. Provide full duplex 10/100Base-T.
 - F. Shall support IEEE 802.3af (PoE) and IEEE 802.3at (PoE+) on input and output.
 - G. Can support 802.3at at 20 watts at a minimum of 1,000 feet of 20awg RG-59.
 - H. Provide with optional power supply when PoE switch is not available.
 - I. Provide with wall mount or rack mount bracket as required.
 - J. Manufacturer:
 1. Veracity Highwire Powerstar

- a. Provide with dedicated power supply as required.
 - 2. Or approved equal
- 17. Ethernet with Power over Ethernet (PoE) UTP SurgeSuppressor
 - A. The Contractor shall provide and install a surge protector for all exterior mounted cameras. Cameras that are not attached to the building or reach above the building roof line shall have a surge protector at the camera side and interior termination side.
 - B. There shall be a minimum of a 36" shielded patch cable from the surge protector to the device to allow for adequate clamping time.
 - C. When protector is mounted in interior, dry or weather sealed enclosure:
 - 1. Shielded RJ-45 jacks and ground stud
 - a. Connect ground directly to ground bar (TMGB/TGB) or ground.
 - b. Do not use shielded cable on the output.
 - 2. Maximum supported data rate: 10,000Mb/s (10 Gigabit)
 - 3. Supports IEEE 802.3af (PoE)
 - 4. Max current rating of 30A per pair.
 - 5. UL 497B listed
 - 6. 110 punch down in and 110 punch down out.
 - a. 110 punch down in and RJ-45 out may be used when output is connected directly to a switch only when approved in specific situations.
 - 7. Manufacturer:
 - a. Ditek DTK-110C6APOE
 - b. Or approved equal
 - D. When protector is exposed to weather or moisture:
 - 1. Shielded RJ-45 jacks and ground connection.
 - a. Connected ground connection directly to ground.
 - b. Do not use shielded cable on the output.
 - 2. Outdoor-rated NEMA 4X enclosure
 - 3. Maximum supported data rate: 1,000Mb/s (1 Gigabit)
 - 4. Supports IEEE 802.3af, 802.3at (PoE) and PoE+ up to 144 watts per port.

5. Max current rating of 20,000A per pair.
 6. UL 497B listed
 7. RG-45 in and RJ-45 out.
 8. Provide with appropriate mounting kit.
 9. Manufacturer:
 - a. Ditek DTK-MRJPOEX
 - b. Or approved equal
18. Ethernet UTP Surge Suppressor (No PoE)
- A. The Contractor shall provide and install a surge protector for all exterior mounted cameras. Cameras that are not attached to the building or reach above the building roof line shall have a surge protector at the camera side and interior termination side.
 - B. There shall be a minimum of a 36" shielded patch cable from the surge protector to the device to allow for adequate clamping time.
 - C. When protector is mounted in interior, dry or weather sealed enclosure:
 1. Shielded RJ-45 jacks and ground stud
 - a. Connect ground directly to ground bar (TMGB/TGB) or ground.
 - b. Do not use shielded cable on the output.
 2. Maximum supported data rate: 10,000Mb/s (10 Gigabit)
 3. Max current rating of 100A per pair.
 4. UL 497B listed
 5. 110 punch down in and 110 punch down out.
 - a. 110 punch down in and RJ-45 out may be used when output is connected directly to a switch only when approved in specific situations.
 6. Manufacturer:
 - a. Ditek DTK-110C6A
 - b. Or approved equal
19. Surge Protection for Low Voltage AC/DC power
- A. The Contractor shall provide a surge protector for all exterior devices being supplied by low voltage power. This does not include devices directly connected to a building

where the risks of surges are negligible.

- B. There shall be a minimum of a 36" shielded cable from the surge protector to the device to allow for adequate clamping time.
 - C. When protector is mounted in interior, dry or weather sealed enclosure:
 - 1. Nominal voltage rating of 24V AC/DC. Provide correct module per required voltage level if different from 24V.
 - 2. 20,000A surge current rating.
 - 3. Protects 2-pair per module.
 - 4. Accepts up to 10AWG cable
 - 5. Connect directly to ground.
 - 6. UL 497B listed
 - 7. Provide quantity of modules as required for the application.
 - 8. Provide base mounting plate as required for the application.
 - 9. Manufacturer:
 - a. Ditek DTK-2MB Mounting Base
 - b. Ditek DTK-2MHLP24B Surge Module
 - c. Or approved equal
20. Surge Protection for 120 VAC power
- A. The Contractor shall provide a surge protector for all 120VAC supplied power supplies.
 - B. There shall be a minimum of a 36" of cable from the surge protector to the load to allow for adequate clamping time.
 - C. When the protector is mount in an interior or exterior location:
 - 1. Nominal voltage rating of 120VAC, single-phase, 20A continuous load.
 - 2. Series connected.
 - 3. 54,000 A surge current rating.
 - 4. 35db of EMI/RFI filtering.
 - 5. UL 1449 Type 2 SPD listed
 - 6. UL 1289 EMI/RFI Noise Filtering listed.
 - 7. LED indicator.

8. Form C dry contacts for monitoring.
9. Include with NEMA 4X enclosure.
10. Maintain a minimum of 3' of cable from the surge protector to the load.
11. Manufacturer:
 - a. Ditek DTK-TSS4D
 - b. Or approved equal

21. Managed Power Supplies

- A. The Contractor shall provide and install a power supply for exterior cameras, fiber optic media converters and other devices which require a dedicated power supply capable of outputting 24VAC and 28VAC.
- B. The Contractor shall connect each device to an output according to the voltage drop to stay as close to 24VAC at the end point as possible based on actual field measurements.
- C. The power supply shall have network modules capable of controlling each individual output via a web interface. Each power distribution module shall be clearly labeled as a 24VAC output or 28VAC output.
- D. The power supply shall be grounded with a 6awg cable.
- E. The Contractor shall provide (1) Altronix BC300 enclosure, (1) T2428300 transformers and (1) LinQ8PD networked power distribution modules. Alternate Altronix configurations may be submitted.

22. Fiber Optic Media Converters

- A. The contractor shall provide fiber optic media converters for locations that require fiber optic cable due to distances that exceed copper cable distance limitation or as identified on the drawings. Provide a rack mount chassis when multiple outputs are required.
- B. Single port, industrial interior/exterior
 1. 10/100 Ethernet full duplex
 2. Operating temperature of -40 - 167 degrees F
 3. 1300 multimode ST fiber connectors
 4. Link budget of 12.0 dB
 5. DIN Rail mountable, provide with appropriate brackets as required

6. AC version requires 22-36 VAC. Provide with power supply where required.
7. Mount in NEMA rated enclosure when installed in the exterior
8. Manufacturer:
 - a. Transition Networks (AC version) M/E-ISW-FX-01AC(ST)
 - b. Or approved equal
- C. Rack mount multi-port, card based headend
 1. 10/100 Ethernet, Class A, full duplex
 2. 1300 multimode ST fiber connectors
 3. Link budget of 11.0 dB
 4. Provide slot quantity as required
 5. 120VAC power connection
 6. Manufacturer:
 - a. Slide in module - Transition Networks C2210-1011
 - b. Chassis - Transition Networks ION219A series
 - c. Or approved equal.
23. Solar Equipment/Devices

The Contractor shall use Victron Energy for solar equipment and devices unless COR-IFS approves another manufacturer.
24. Wireless Transmitters/Receivers
 - A. The Contractor shall provide a wireless point-to-point or point to multi-point system where required.
 - B. The system shall use unlicensed frequencies.
 - C. The units shall be managed with a web interface for configuration and must support both http (Hypertext Transfer Protocol) and https (Hypertext Transfer Protocol Secure)
 - D. The units shall support Network Time Protocol and the contractor must configure the units using a COR NTP Server.
 - E. The units shall support Dynamic Host Configuration Protocol (DHCP). The contractor shall configure the units to use DHCP reservation. The contractor shall coordinate with COR-IFS and COR-IT to configure DHCP reservation.
 - F. The units shall support Simple Network Management Protocol (SNMP).

- G. The Contractor shall provide the appropriate throughput licensing based on the camera streaming bandwidth requirements noted within these specifications.
- H. The Contractor shall provide the appropriate mounting hardware rated for the appropriate wind, snow and ice loading.
- I. All hardware shall be grounded.
- J. When point to multi-point is required the Contractor shall utilize a base station with a 120-degree horizontal beamwidth. Point to point may utilize edge units with a 33-degree horizontal beamwidth.
- K. Manufacturer:
 - 1. Cambium Networks cnVision for Wireless Video Surveillance
 - a. Primary Use:
 - An omnidirectional Hub to connect many cameras in any direction.
 - A hub that is compatible with many kinds of antennas.
 - High gain client useful for tough climates, longer distances, or industrial sites.
 - High gain client that can directly power up to three IP cameras or devices.
 - Standard client suitable for most conditions.
 - Small form factor client for shorter distances.

Part 3 - Execution

3.1 Security Cameras and Video Monitoring System

- 1. Contractor shall provide all necessary wiring, cabling, conduit, labor, tools, equipment, licenses and ancillary materials required to furnish and install new security cameras and video monitoring system (Milestone Video Archiver(s) and Milestone Video Monitoring Workstation) as indicated on the drawings and in these specifications. Contractor shall also connect new cameras to video monitoring system and City's existing security network and coordinate testing and final system configuration.

3.2 Requirements are indicated elsewhere in this specification for work including, but not limited to:

- 1. Cameras, associated power supplies, media convertors and data cabling and equipment to be provided and installed by the Contractor.
 - a. Connection by the Contractor of the new Video Archiver(s), Video Monitoring Workstation and security cameras to the Owner's security network.
 - i. The Contractor shall coordinate with the Owner for specific network standards and for local area network (LAN) connections.
- 2. All cameras shall be connected to the facility's new Milestone Video Archiver(s) for local monitoring and recording. The Contractor shall be responsible for connecting all

cameras to the Owner's network and for coordinating and configuring the cameras to be viewable through the Milestone Video Monitoring Workstations.

- a. The new Milestone Video Archiver(s) shall be an extension of the Owner's existing Milestone Video Management System.
- b. The Contractor shall provide all Milestone and camera integration licenses necessary to integrate the Milestone Video Management System into the Owner's Vikon Access Control System.
- c. It is the Contractor's responsibility to coordinate any network, software and hardware requirement(s) needed to connect any device or server to the Owner's network. If any device or server does not meet the Owner's network requirement specification, the Contractor shall be responsible to provide an adequate replacement or bring the delinquent device up to the Owner's required specification before connecting the device to the Owner's network.

3.3 The extent of security system work for the project includes, but is not limited to, the following under the Base Bid:

- a. Installation of new digital video surveillance system cameras, media converters, Milestone Video Archivers, Milestone Workstations and associated equipment and hardware to provide a fully functioning video surveillance system.
- b. Miscellaneous terminations, programming, licenses and updates to extend up to the Owner's final acceptance of the installed system.

3.4 The Milestone Video Archivers shall provide management, control, recording and monitoring of all new facility video surveillance system cameras.

3.5 The Contractor shall not have a password to access the Enterprise server. The Contractor shall only have local restricted access.

3.6 Camera installation and work required to bring new security equipment up to operational status for final acceptance by the Owner shall include but not be limited to the following:

- a. Determination of hardware, software, and operations requirements for implementation.
- b. Set up and configuration of parameters on each camera for recording on the Video Archivers
- c. Set-up of optimum recording parameters on each Video Archiver.
- d. Testing of video systems operations based on a camera by camera walkthrough.
- e. Organizing and conducting end-user training.

3.7 The Contractor shall provide onsite professional services to assist in the initial setup and programming of all systems specified within this specification.

- 3.8 The Contractor shall coordinate conduit routes and locations with the Electrical Contractor before conduits are to be installed.
1. The Contractor shall coordinate any and all concrete and anchoring information with the General Contractor before the installation of concrete footers for any planned exterior pole supports for cameras.
 2. All cabling shall be provided by the Contractor.
 3. Contract close out submittals to include:
 - a. Training course materials
 - b. Commissioning Test Plan and Check-Off List
 4. As-built drawings to include elementary and wiring diagrams of the security systems to be used for record drawings.
- 3.9 Testing
- A. Site tests shall be performed with a representative of the Owner in attendance.
 - B. Tests shall be performed on each major component of the Video Management System.
 - C. Prior to energizing or testing the system, ensure the following:
 1. All products are installed in a proper and safe manner per the manufacturer's instructions.
 2. Dust, debris, solder, splatter, etc., is removed.
 3. Cable is dressed, routed, and labeled; connections are consistent with regard to polarity.
 4. All products are neat, clean, and unmarred, and parts are securely attached.
 - D. Contractor shall ensure that each device in the security system is functioning normally and in such a manner as to meet the functional and performance requirements in this specification.
- 3.10 Training
- A. Provide system operations, administration, and maintenance training by factory-trained personnel qualified to instruct.
 1. The Contractor shall provide scheduled and dedicated training time for administration and investigation for the project site.
 2. The Contractor shall provide an allotment of training hours for the administration and use of the security system and VMS platform.

3. Provide printed training materials for each trainee, including product manuals, course outline, workbook or student guides, and written examinations for certification.
4. Provide hands-on training with operational equipment.
5. Training shall be oriented to the specific system being installed under this contract as designed and specified.
6. Contractor shall provide all necessary documentation of system operating parameters prior to scheduled training sessions.

3.11 Warranty

A. Contractor Workmanship Warranty

1. The contractor shall warrant **all installation workmanship** (cabling, terminations, mounting, labeling, configurations) for a minimum of **one year from final acceptance**.
2. Includes correction of installation defects, configuration errors, or cabling failures at **no additional cost** to the owner.

B. Standard IP Camera, Solar Equipment, Wireless Equipment Manufacturer Warranty

1. The contractor shall include the standard manufacturer's warranty in the warranty letter to the City of Raleigh.

3.12 Installation Practices

- A. All services provided shall be professional and conform to the highest standards for safety and industry practices. The Owner reserves the right to halt any installation due to poor workmanship. All work shall be defect free, and the installer shall replace, at their expense, any work found to be defective.
- B. The Owner reserves the right to halt any installation due to failure of Contractor to observe installation-free periods due to instructional or administrative requirements. To the maximum extent possible, the Owner will provide advance notice of such periods.
- C. Contractor is responsible for providing a complete and functional video surveillance system.
- D. All manufactured items, materials, and equipment shall be applied, installed, connected, erected, used, and adjusted as recommended by the manufacturers, or as indicated in their published literature, unless specifically noted herein to the contrary.
- E. Contractor shall follow these standards and approved submittals for locations of power supplies. The Owner intends to limit the number and location of power supplies to facilitate more effective long-term support and maintenance of the system.

3.13 Coordination

- A. Contractor shall provide up to 12 hours of scheduled and dedicated coordination time to assist Owner with camera positioning and coordination as requested by Owner or Consultant.

3.14 Installation Appearance and Equipment Organization

- A. All cables and equipment terminating at panels frames shall be vertically straight, with no cables crossing each other, from twelve inches inside the ceiling area to the termination block.
- B. All cable bundles shall be combed and bundled to accommodate individual termination block rows and panels.
- C. For any given telecom room, a horizontal and vertical alignment for all mounting hardware will be maintained to provide a symmetrical and uniform appearance to the distribution frame.
- D. All surface-mounted devices shall be firmly secured level and plumb
- E. All rack mount equipment shall be securely installed.

3.15 Hardware Layout

- A. Hardware positioning and layout shall be reviewed and approved by the Owner prior to construction. The review does not exempt Contractor from meeting any of the requirements stated in this document.

3.16 VMS Installation Practices

- A. Verify that the manufacturer approved server hardware, OS meets the Owner's IT standards prior to ordering.
- B. Coordinate server power, cooling, and mounting requirements with Owner prior to installation.
- C. Coordinate virus scan/security software requirements with Owner and manufacturer prior to installation.

3.17 Device Cabling/Wiring Installation Practices

- A. All external wire and cables shall be supported at least every five feet from the structure or as required to maintain not more than 12" cable sag between supports and without over tensioning the cables. Provide j-hooks as needed where cable tray or raceway is not available.
- B. Cabling Contractor to ensure there is at least 2-inches of physical separation between security cabling and voice/data cabling throughout cable path. Voice/data cabling Contractor has first claim to cable tray.

- C. All cables, regardless of length, shall be labeled within 18" of both ends with an identifier that is keyed to the door, room, or corridor number as identified.
- D. All cables shall have 6-foot service loops neatly coiled in the equipment room. During initial cable rough-in, this Contractor shall have sufficient slack to route anywhere within the equipment room.
- E. Cabling shall be adequately supported with Velcro wire wraps and horizontal support cable managers fastened to rack frame. Cables shall be dressed in a neat and orderly fashion. Any cabling or equipment installation that is deemed unacceptable by the Owner or Consultant shall be replaced or corrected by the Contractor at no additional cost. **Plastic zip ties are not allowed.**
- F. All cables are to run at right angles to the structure, placed above the ceiling in halls or corridors.
- G. Cables shall not run above red iron joist.
- H. Contractor shall make every effort to conceal wiring and other apparatus into walls, floors, and ceilings, assuming code and good engineering practice allows and suggests.
- I. Ties and straps shall be installed snugly without deforming cable insulation. Ties shall be spaced at uneven intervals not to exceed four feet. No sharp burrs shall remain where excess length of the cable tie has been cut.
- J. Contractor shall notify Owner immediately if obstruction or hazard is discovered in a pathway provided by others.
- K. Cable shall be stored and handled to assure that it is not stretched, kinked, crushed, or abraded in any way. Bend radiuses shall meet manufacturer specifications and/or recommendations. Cable shall not be installed in ambient temperatures or moisture conditions above or below the manufacturer's rating.
- L. No splices shall be installed in any cable.

3.18 Cable Termination

- A. Termination hardware (blocks and patch panels) positioning and layout shall be reviewed and approved by the Owner prior to construction. The review does not exempt Contractor from meeting any of the requirements stated in this document.

3.19 Fire Stopping

- A. Fire stopping of openings between floors, fire-rated walls, and smoke-rated walls, created by others for this Contractor to pass cable through, shall be the responsibility of this Contractor. Sealing material and application of this material

shall be accomplished in such a manner that is acceptable to the local fire and building authorities having jurisdiction over this work.

- B. Any openings created by or for this Contractor and left unused shall be sealed up by this Contractor.
- C. This Contractor shall be responsible for creating a waterproof seal in and around any openings that this Contractor creates from the structure to the outside environment.

3.20 System Inspection

- A. Contractor shall coordinate with project representative for inspection after Contractor has completed testing of entire system.
- B. Contractor shall have trained Contractor representative and testing equipment on site during inspection to assist with spot verification of tests.
- C. Contractor shall verify with Project Representative the precise positioning of camera aim and shall make fine adjustments as requested.
- D. **Milestone VMS Vendor Installation Commissioning Checklist**

Network & Security Configuration

- Apply security hardening (user roles, passwords, and permissions)
- Verify Active Directory integration (if required)
- Validate NTP synchronization for accurate timestamps

Camera & Device Commissioning

- Physically install and align all cameras
- Ensure proper video stream settings (codec, bit rate, frame rate)
- Assign correct camera recording rules and schedules
- Test PTZ functionality, motion detection, and analytics (if applicable)
- Validate camera event triggers and alarms

System Integration & Alerts

- Configure third-party integrations (Access Control, BAS, alarms, etc.)
- Set up system alerts and email/SMS notifications
- Enable Milestone rules for automated actions

- Verify map-based camera visualization (if applicable)

Testing & Optimization

- Perform video playback and export tests
- Validate live streaming and adaptive streaming
- Test failover and redundancy features (if applicable)
- Review storage utilization and optimize retention settings

User Training & Documentation

- Conduct administrator and operator training
- Provide system documentation
- Validate user access permissions and auditing policies

Final Acceptance & Handover

- Perform a final walkthrough with stakeholders
- Obtain client sign-off and approval
- Handover all system documentation, configurations, and backups

3.21 Labeling

- A. Contractor shall neatly label all security devices and cabling at both ends. All labels shall be on Project as-built drawings. Coordinate with the Owner to verify preferred camera housing labelling location prior to final label installation.
 1. Use **durable, weather-resistant** labels (especially for outdoor cameras).
 2. Labels should be **clear, legible, and resistant to fading or peeling**.
 3. Place labels at **both ends** of the cable (camera side & switch/patch panel side).
 4. Use a **consistent format** for all labels to avoid confusion.
- B. **Labeling Format Example**
 1. **[Camera ID] - [Location] - [Cable Number] – [switch port]**
 - a. **Example:** CAM-01 - Lobby Entrance - CBL-01 - Port 12
 2. Alternatively, if you have multiple network closets or floors:
 - a. **Example:** CAM-02 - 2nd Floor Hallway - IDF-2A - CBL-05

3.22 Camera Installation

- A. Contractor shall field verify all camera locations and positioning with Owner prior to installation.

3.23 Documentation

- A. Upon completion of the installation, Contractor shall provide full documentation sets to the Consultant for approval. All documentation shall become the property of the Owner.
- B. Documentation shall include the additional specific items detailed in the subsections below:
 - 1. Contractor shall provide hard copy and electronic forms of the final test results.
 - 2. Contractor shall provide milestone configuration back up for system installed.
 - 3. Contractor shall provide a completed configuration report from installed Milestone system. Provide report electronically.
 - 4. Contractor shall provide wireless Transmitters/Receivers configuration backup to owner.
 - 5. Contractor shall provide final "As-Built "construction documentation including the following:
 - a. The contractor shall contact the COR-IFS representative for an updated COR As-Built Template for construction documentation.
 - b. Camera label/identifier
 - c. Location of each drop by orientation/permanent landmark in the room
 - d. Wireless Transmitters/Receivers manufacturer, type, MAC address, IP Address, hostname, Radio mode: Client or Hub, Operating Frequency, operating channel bandwidth, transmitter output power, downlink RSSI (Received Signal Strength Indicator), downlink SNR (Signal to Noise ratio).
 - e. The Contractor shall include solar drawings in the As-Built construction document per the COR-IFS template when solar equipment is part of the VMS solution. Solar System data includes Solar Panel Wattage, Solar Panel amperage, battery Ah, battery standard voltage, solar system voltage, charging time at peak sunlight, and functional time off sunlight.
 - f. Contractor shall provide accurate as-built Construction Drawings. The drawings are to include cable routes and device locations.

3.24 Pre-Checkout

- A. The Contractor shall demonstrate the following to Owner during system demonstration.
 - 1. The cameras are fully installed and functional.
 - 2. Camera adjustments are complete to the Owner's satisfaction including.

- a. Aim/Zoom
- b. Focus/Back Focus
- c. Masking Zones
- d. Motion Detection Zones
- e. Pre-Sets/Tours

3.25 Final Acceptance

A. The Contractor shall demonstrate the following before final approval.

- 1. Owner training is complete.
- 2. Punch list items are complete.
- 3. As-built documentation is complete and submitted to Owner/Consultant.
- 4. Warranty Letter

End of Section 28 20 00

GENERAL ELECTRICAL NOTES

1.

ALL WORK INDICATED ON DRAWINGS AND SPECIFICATIONS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST REQUIREMENTS OF THE CITY, COUNTY AND STATE BUILDING CODES, THE NATIONAL ELECTRICAL CODE, AND THE LOCAL AUTHORITY HAVING JURISDICTION.
2.

THESE PLANS ARE DIAGRAMMATIC IN NATURE AND SHOW THE GENERAL LOCATION OF DEVICES, EQUIPMENT, ROUTING, ETC. ALL WORK SHALL BE COORDINATED WITH ALL OTHER TRADES PRIOR TO INSTALLATION. THE CONTRACTOR SHALL COORDINATE INSTALLATION / ROUTING OF ALL WORK WITH EXISTING CONDITIONS AND OTHER TRADES WORK PRIOR TO ROUGH-IN. CONTRACTOR SHALL PROVIDE ALL NECESSARY ANCILARY DEVICES REQUIRED FOR A COMPLETE AND COORDINATED INSTALLATION.
3.

ALL EXISTING INFORMATION SHOWN IS BASED ON NON-DESTRUCTIVE FIELD INVESTIGATION AND / OR EXISTING DRAWING INFORMATION PROVIDED BY THE OWNER. DURING THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT / ENGINEER OF ANY HIDDEN CONDITIONS FOUND THAT REQUIRE CORRECTIVE ACTION BEYOND THE CONTRACTOR'S SCOPE OF WORK.
4.

IF THE CONTRACTOR NOTICES THAT NECESSARY INFORMATION IS ABSENT ON DRAWINGS OR IN SPECIFICATIONS SUCH THAT THE CONTRACTOR IS UNSURE OF MATERIALS, SIZING, OR ROUTING OF SYSTEMS, THEN IT IS IMPERATIVE THAT THE CONTRACTOR CONTACT THE ARCHITECT / ENGINEER DURING BID OR PRIOR TO ROUGH-IN TO REQUEST CLARIFICATION. IF THE CONTRACTOR PROCEEDS WITH INSTALLATION WITHOUT DIRECTION FROM THE ARCHITECT / ENGINEER, THEN THE CONTRACTOR ASSUMES ALL COST ASSOCIATED WITH HIS ACTIONS AND RESPONSIBILITY FOR THE FUNCTION OF THE SYSTEM(S).
5.

ALL PENETRATIONS THROUGH FIRE-RATED WALLS OR FLOORS SHALL BE SEALED IN ACCORDANCE WITH LISTED THROUGH PENETRATION DETAIL(S) APPLICABLE FOR THE PENETRATION TYPE AND WALL / FLOOR CONSTRUCTION ENCOUNTERED. ALL PIPE PENETRATIONS THROUGH NON-RATED WALLS OR FLOORS SHALL BE SEALED WITH THE APPROPRIATE WALL / FLOOR MATERIALS PER THE ARCHITECTURAL SPECIFICATIONS. ALL PIPE PENETRATIONS THROUGH EXTERIOR WALLS SHALL BE SEALED WITH MATERIALS PER THE ARCHITECTURAL SPECIFICATIONS AND WATERPROOFED TO PREVENT MOISTURE FROM ENTERING THE BUILDING. ALL ROOF PENETRATIONS SHALL BE FLASHED AND MADE WATERTIGHT IN A MANNER THAT IS CONSISTENT WITH ROOF CONSTRUCTION AND APPROVED BY THE ROOF MATERIAL MANUFACTURER SO AS NOT TO VOID THE ROOF WARRANTY. REFER TO PLANS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. ALL WALL, FLOOR AND ROOF PENETRATIONS AND SEALING OF PENETRATIONS SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR.
6.

WHERE THE WORD 'PROVIDE' IS USED, IT SHALL BE DEFINED TO MEAN THAT THE DEVICE / EQUIPMENT INDICATED SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR, UNLESS OTHERWISE NOTED.
7.

ALL MANUFACTURER'S MINIMUM WORKING CLEARANCE RECOMMENDATIONS SHALL BE MAINTAINED ON ALL EQUIPMENT.
8.

ALL CONDUIT SHALL BE NEATLY ARRANGED, PROPERLY ALIGNED AND SUPPORTED. CONDUIT SHALL BE KEPT AT LEAST SIX (6) INCHES FROM FLUES, STEAM PIPES, OR HOT WATER PIPES WHERE POSSIBLE.
9.

CONCEALED CONDUITS SHALL BE RUN IN A DIRECT LINE WITH LONG SWEEP BENDS AND OFFSETS. EXPOSED CONDUITS SHALL BE RUN PARALLEL TO AND AT RIGHT ANGLES TO BUILDING LINES.
10.

CONDUITS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET, FROM OUTLETS TO CABINETS, PULL OR JUNCTION BOXES AND SHALL BE SECURED TO ALL BOXES WITH LOCKNUTS AND BUSHING IN SUCH A MANNER THAT EACH SYSTEM SHALL BE ELECTRICALLY CONTINUOUS THROUGHOUT.
11.

WHERE CONDUITS ARE RUN FROM INDOORS TO OUTDOORS, CONDUITS SHALL BE SEALED WITH VAPOR SEAL COMPOUND AT THE POINT OF ENTRY INTO THE BUILDING OR BUILDINGS IN ACCORDANCE WITH NEC ARTICLE 230.8.
12.

ALL CONDUIT PENETRATIONS THRU ELECTRICAL/MECHANICAL EQUIPMENT ENCLOSURES SHALL BE PROPERLY SEALED SO AS NOT TO VOID THE U.L. LISTING OR INTEGRITY OF THE FACTORY ENCLOSURE.
13.

CONDUCTORS SHALL BE SOFT-DRAWN COPPER AND THIRD-PARTY LISTED UNLESS OTHERWISE NOTED, WITH THHN / THWN-2 INSULATION UNLESS OTHERWISE NOTED. CONDUCTOR SIZES SHALL BE STANDARD AMERICAN WIRE GAUGE SIZES. CONDUCTORS AND EQUIPMENT TERMINALS SHALL BE RATED AT 75 DEGREE CELSIUS. WERE EQUIPMENT PROVIDED DOES NOT HAVE TERMINALS RATED AT 75 DEGREE CELSIUS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ADJUSTMENTS TO CONDUCTOR AND CONDUIT SYSTEMS ACCORDINGLY BASED ON THE NEC FOR THE EQUIPMENT'S RATING.
14.

UNLESS SPECIFICALLY NOTED OTHERWISE, THE MINIMUM WIRE SIZE SHALL BE #12 AWG, EXCEPT THAT CONTROL WIRING MAY BE #14 AWG OR #16 AWG AS NOTED ON PLANS. ALL CONDUCTORS (POWER / CONTROL) SHALL BE INSTALLED IN CONDUIT UNLESS SPECIFICALLY NOTED OTHERWISE.
15.

WHERE CONDUCTORS ARE RUN IN PARALLEL BOTH CONDUCTORS ARE TO BE TAPPED WHERE BRANCH CIRCUITS ARE TAKEN OFF.
16.

SPLICING OF CONDUCTORS SHALL BE HELD TO A MINIMUM. CONDUCTOR RUNS LESS THAN 50' IN LENGTH SHALL NOT BE SPLICED. SPlice CONNECTIONS SHALL BE DOCUMENTED ON DRAWINGS INDICATING LOCATION, WIRE TYPE, AND SPlice METHOD, FOR INSPECTION PRIOR TO (PUNCH LIST) CLOSEOUT OF PROJECT.
17.

ALL CONDUCTORS INTERNAL TO ELECTRICAL EQUIPMENT SHALL BE NEATLY TIE WRAPPED WITH NYLON TIE WRAPS. CONDUCTORS SHALL BE ROUTED PARALLEL & VERTICAL TO ENCLOSURE SIDES. ALL SHARP EDGES ON CUT TIE WRAPS SHALL BE REMOVED.
18.

ALL EQUIPMENT FEEDERS SHALL BE CONTINUOUS FROM THE DISCONNECT SWITCH TO THE MOTOR / EQUIPMENT TAP BOX. SPLICES SHALL NOT BE ALLOWED.
19.

HANGERS AND CLAMPS SHALL BE MADE OF DURABLE MATERIALS SUITABLE FOR THE APPLICATION INVOLVED. HANGER ASSEMBLIES SHALL BE PROTECTED BY GALVANIZING, OR OTHER SUITABLE PRESERVATION METHODS TO PREVENT CORROSION. THE REQUIRED STRENGTH OF THE SUPPORTING EQUIPMENT AND SIZE AND TYPE OF ANCHORS SHALL BE BASED ON THE COMBINED WEIGHT OF CONDUIT, HANGER AND CABLES.
20.

WHERE AN INDIVIDUALLY MOUNTED SAFETY SWITCH, STARTER, OR CIRCUIT BREAKER IS SHOWN ADJACENT TO ITS RESPECTIVE LOAD AND NOT MOUNTED ON A WALL, PROVIDE ALL SUPPORTS, BRACKET, ANCHORING, ETC. NECESSARY TO PROPERLY SUPPORT THE DEVICE.
21.

APPROPRIATE GROUNDING LUGS SHALL BE PROVIDED ON ALL ENCLOSURES TO BE GROUNDDED.
22.

EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE, ALL EXPOSED NON-CURRENT CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, RACEWAY SYSTEMS AND NEUTRAL CONDUCTOR OF THE WIRING SYSTEM SHALL BE GROUNDDED.
23.

EACH RACEWAY FOR ALL POWER SYSTEMS AND BRANCH CIRCUITS SHALL HAVE A SEPARATE GROUNDING CONDUCTOR. THE RACEWAY SYSTEM SHALL NOT BE RELIED UPON FOR EQUIPMENT GROUNDING.
24.

VOLTAGE DROP WIRING NOTE - VOLTAGE DROP HAS BEEN CONSIDERED IN THE DESIGN OF ALL BRANCH CIRCUITRY AND FEEDER SIZES BASED UPON THE ILLUSTRATED EQUIPMENT LAYOUTS AND SHORTEST CONDUCTOR / RACEWAY ROUTING. HOWEVER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING VOLTAGE DROP CONDITIONS OF FINAL CONDUIT / CONDUCTOR ROUTINGS DO NOT EXCEED THE FOLLOWING MAXIMUM VALUES AND UPSIZE CONDUCTORS AND CONDUIT AS REQUIRED / NOTED BELOW:

a.

FEEDER CIRCUITS:

•

MAX 3% VOLTAGE DROP (PER NEC ARTICLE 215.2(A)(4) INFORMATIONAL NOTE NO. 2)

b.

BRANCH CIRCUITS:

•

MAX 3% VOLTAGE DROP (PER NEC ARTICLE 210.19(A)(1) INFORMATIONAL NOTE NO. 4)

c.

COMBINED VOLTAGE DROP ON FEEDER AND BRANCH CIRCUIT TO THE FURTHEST DEVICE OUTLET / UTILIZATION EQUIPMENT SHALL NOT EXCEED 5%.

d.

EQUIPMENT GROUND CONDUCTORS SHALL BE UPSIZED AS REQUIRED PER NEC ARTICLE 250.122.(B).

e.

IN ADDITION TO THE REQUIREMENTS NOTED ABOVE, INCREASE CONDUCTOR SIZE BASED ON LENGTH OF RUN AS INDICATED BELOW. ALL BRANCH CIRCUIT WIRING TO 120VOLT RECEPTACLES SHALL BE AS FOLLOWS:

•

MAXIMUM OVERALL LENGTH 50FT - 2-#12, 1-#12G

•

MAXIMUM OVERALL LENGTH 140FT - 2-#10, 1-#10G

•

MAXIMUM OVERALL LENGTH 225FT - 2-#8, 1-#8G

•

MAXIMUM OVERALL LENGTH 350FT - 2-#6, 1-#6G

f.

WHERE THE CONDUCTOR LENGTH FROM THE PANEL TO THE FIRST OUTLET ON A 277 VOLT CIRCUIT EXCEEDS 125 FEET, THE BRANCH CIRCUIT CONDUCTORS FROM THE PANEL TO THE FIRST OUTLET SHALL NOT BE SMALLER THAN #10 AWG.

25.

THE CONTRACTOR SHALL FULLY COORDINATE ALL WORK PRIOR TO ROUGH-IN OF ANY MECHANICAL OR ELECTRICAL EQUIPMENT. REFER TO MECHANICAL SCHEDULES FOR DESIGNATIONS OF ALL EQUIPMENT REQUIRING CONTROL WIRING. THE CONTRACTOR SHALL PROVIDE ALL CONTROL WIRING AND HARDWARE RELATED TO CONTROL WORK (I.E. TRANSFORMERS, CONTROL MODULES, CONNECTORS, ETC.) ALL CONTROL WIRING SHALL BE PLENUM RATED AND INSTALLED IN CONDUIT UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIALS AND LABOR TO PROVIDE THE 120 VOLT POWER SOURCES REQUIRED TO OPERATE ALL LOW VOLTAGE MECHANICAL EQUIPMENT AND MAKE FINAL 120 VOLT CONNECTIONS TO CONTROL EQUIPMENT. CONTRACTOR SHALL PROVIDE ALL JUNCTION BOXES, RECEPTACLES, SNAP SWITCHES AND 120 VOLT WIRING, AND SHALL INSTALL ALL WIRING IN CONDUIT.

26.

CONTRACTOR SHALL PROVIDE LABELS ON RECEPTACLE FACEPLATES TO DENOTE THE PANEL AND CIRCUIT SERVING EACH DEVICE. LABELS SHALL BE THE SELF-ADHESIVE TYPE AND BE WHITE WITH BLACK LETTERING. TEXT HEIGHT SHALL BE BETWEEN 3/8" AND 1/4" TO ENSURE LEGIBILITY AND TO PROPERLY FIT ON THE FACEPLATE AS REQUIRED.

27.

TYPICAL DEVICE MOUNTING HEIGHTS - DEVICE MOUNTING HEIGHTS NOTED SHALL BE TO CENTER LINE OF DEVICE UNLESS OTHERWISE NOTED. REFER TO PLANS / SYMBOLS FOR ADDITIONAL DEVICE MOUNTING REQUIREMENTS:

RECEPTACLES

.....

18" AFF

RECEPTACLES (TV)

.....

60" AFF

DATA OUTLET

.....

18" AFF

DATA OUTLET (TV)

.....

60" AFF

TELEPHONE OUTLET

.....

48" AFF

LIGHT SWITCH

.....

48" AFF

EXIT SIGN (WALL MOUNTED)

.....

7-8" AFF OR 1-4" ABOVE DOOR

FIRE ALARM PULL STATION

.....

48" AFF TO TOP OF DEVICE

FIRE ALARM NOTIFICATION DEVICE

.....

80" AFF TO BOTTOM OF DEVICE

LIGHT FIXTURE SYMBOLS

SYMBOL	DESCRIPTION
	POLE-MOUNTED EXTERIOR LED LIGHT FIXTURE (PARKING LOT, SIDEWALKS)
	LED GROUND MOUNTED SIGNAGE LIGHT FIXTURE

RACEWAY SYMBOLS

SYMBOL	DESCRIPTION
	CONDUIT CONCEALED IN WALLS OR ABOVE CEILINGS.
	UNSWITCHED LIGHTING CIRCUIT.
	NEW HOMERUN TO PANELBOARD. LETTERS INDICATE PANELBOARD AND NUMBERS INDICATE CIRCUITS IN PANELBOARD.
	UNDERGROUND/UNDERSLAB/FLOOR RACEWAY. REFER TO PLANS FORM MORE INFORMATION.
	CONDUIT BREAK
	INDICATES CAPPED CONDUIT END
	UNDERGROUND ELECTRICAL
	GENERATOR EMERGENCY "LIFE SAFETY" POWER CONDUIT
	GENERATOR EMERGENCY "STAND-BY" POWER CONDUIT
	CONDUIT TURNED DOWN
	CONDUIT TURNED UP

POWER / DATA SYMBOLS

SYMBOL	DESCRIPTION
	WP DUPLEX RECEPTACLE. "WP" INDICATES WEATHERPROOF. PROVIDE LEGRAND MODEL NUMBER: WUICAST1 OR APPROVED EQUAL COVERS WHERE WEATHERPROOF RECEPTACLES ARE INDICATED.
	WP SPECIAL PURPOSE RECEPTACLE. "WP" INDICATES WEATHERPROOF. PROVIDE LEGRAND MODEL NUMBER: WUICAST1 OR APPROVED EQUAL COVERS WHERE WEATHERPROOF RECEPTACLES ARE INDICATED.
	WP TELEPHONE/DATA OUTLET. "WP" INDICATES WEATHERPROOF. PROVIDE LEGRAND MODEL NUMBER: WUICAST1 OR APPROVED EQUAL COVERS WHERE WEATHERPROOF RECEPTACLES ARE INDICATED. PROVIDE 1" CONDUIT WITH PULL STRING TO TELECOM CABINET.
	PANELBOARD
	JUNCTION BOX. SIZE PER N.E.C.
	HEAVY DUTY DISCONNECT. SIZE AS INDICATED IN DRAWINGS.
	30/NF FUSE SIZE -NF INDICATES NON-FUSED -F INDICATES FUSED PER EQUIPMENT NAMEPLATE NUMBER INDICATES FRN FUSE SIZE
	EVC ELECTRICAL VEHICLE CHARGING STATION WITH DUAL CHARGING PORTS OR SINGLE CHARGING PORTS AS INDICATED. BOLLARD STYLE, MOUNTED TO "PLP EVBASE/SSY-200" FOUNDATIONS. BASIS OF DESIGN IS THE ATOM POWER 48A CHARGER. EVCS AND FOUNDATIONS SHALL BE PROVIDED BY THE EV CONTRACTOR.
	FE FUTURE ELECTRICAL VEHICLE CHARGING STATION. ELECTRICAL CONTRACTOR SHALL INSTALL "PLP EVBASE/SSY-200" EV CHARGING STATION FOUNDATIONS PROVIDED BY EV CONTRACTOR ACCORDING TO MANUFACTURERS INSTALLATION INSTRUCTIONS WHERE INDICATED. COORDINATE INSTALLATION WITH EV CONTRACTOR.
	10' X 10' SERVICE GROUNDING GRID.
	HH ELECTRICAL POWER HANDHOLE. REFER TO DETAILS FOR SIZING AND CONSTRUCTION REQUIREMENTS.
	TH TELECOM HANDHOLE. REFER TO DETAILS FOR SIZING AND CONSTRUCTION REQUIREMENTS.

SECURITY SYMBOLS

SYMBOL	DESCRIPTION
	C POLE MOUNTED CAMERA MOUNTED TO LIGHT POLE OR FREESTANDING POLE AT APPROXIMATELY 15' AFG.

GENERAL SYMBOLS LEGEND NOTES

A.

NOT ALL SYMBOLS SHOWN ON THIS SHEET ARE NECESSARILY USED ON THE DRAWINGS AND WHEN NOT USED THEY SHOULD BE ASSUMED NOT TO APPLY TO THIS PROJECT. ADDITIONAL SYMBOLS MAY BE INCLUDED ON DRAWINGS THAT ARE NOT SHOWN HERE AND ARE IDENTIFIED ON THE DRAWINGS PERTAINING TO THAT PARTICULAR SYSTEM.

B.

REFER TO SPECIFICATIONS, ARCHITECTURAL DRAWINGS, APPLICABLE SCHEDULES AND DETAILS FOR ADDITIONAL INFORMATION REGARDING EACH DEVICE IDENTIFIED ON THIS LEGEND.

C.

SUBSCRIPTS SHOWN ON THE LEGEND ON A DEVICE MAY BE APPLIED TO ANY DEVICE IN THE SAME GROUP. I.E. "T" INDICATES COUNTER HEIGHT.

D.

ABBREVIATIONS MAY BE APPLIED TO ANY SYMBOL.

E.

REFER TO OTHER TRADE DRAWINGS FOR THOSE TRADES EQUIPMENT SYMBOLS AND ABBREVIATIONS.

F.

VERIFY LOCATIONS AND DIMENSIONS OF ALL EQUIPMENT AND COORDINATE WITH OTHER TRADES PRIOR TO ROUGH-IN.

G.

CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY LOCATIONS AND ELEVATIONS OF CASEWORK PRIOR TO ROUGH-IN.

H.

ALL CIRCUITS SHALL CONSIST OF 2#12 + #12G IN 3/4" C. THHN/THWN IN EMT UNLESS OTHERWISE NOTED.

I.

MINIMUM RACEWAY SIZE IS 3/4" FOR ALL CIRCUITS UNLESS OTHERWISE NOTED.

J.

ALL FIRE ALARM RACEWAY AND JUNCTION BOXES SHALL BE PAINTED OR DYED RED.

K.

ALL SECURITY, COMMUNICATIONS AND INTERCOM CONDUIT SHALL BE PROVIDED WITH THERMAL PLASTIC (NYLON) INSULATED BUSHINGS AT BOTH THE DEVICE OUTLET AND THE END OF THE CONDUIT, PRIOR TO CABLING LEAVING RACEWAY AND LANDING IN CABLE TRAY.

ABBREVIATIONS

SYMBOL	DESCRIPTION
AFG	ABOVE FINISHED GRADE
AFF	ABOVE FINISHED FLOOR
BFG	BELOW FINISHED GRADE
C	CONDUIT
EGC	EQUIPMENT GROUND CONDUCTOR
EM	EMERGENCY
EUG	ELECTRICAL UNDERGROUND
EW	ELECTRIC WATER COOLER
EW	ELECTRIC WATER HEATER
G, GND	GROUND
GEC	GROUNDING ELECTRODE CONDUCTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GRS	GALVANIZED RIGID STEEL
GW	GAS WATER HEATER
IG	ISOLATED GROUND
IWH	INSTANTANEOUS WATER HEATER
KCMIL	ONE THOUSAND CIRCULAR MILS
KVA	KILO-VOLT AMPERES
KW	KILOWATTS
KWH	KILOWATT-HOURS
MCB	MAIN CIRCUIT BREAKER
MLO	MAIN LUG ONLY
NEC	NATIONAL ELECTRICAL CODE
NL	INDICATES FIXTURE ON UNSWITCHED NIGHT LIGHT CIRCUIT
NTS	NOT TO SCALE
NVR	NETWORK VIDEO RECORDER
PH, Ø	PHASE
SWBD	SWITCHBOARD
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR (IG)
UE	UNDERGROUND ELECTRIC
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
UT	UNDERGROUND TELECOMM
V	VOLTS
WP	WEATHERPROOF
XFMR	TRANSFORMER

ENERGY CODE SUMMARY

METHOD OF COMPLIANCE: ENERGY CODE - PRESCRIPTIVE

ADDITIONAL PRESCRIPTIVE COMPLIANCE:

☐

C406.2 MORE EFFICIENT HVAC EQUIPMENT PERFORMANCE

☐

C406.3 REDUCED LIGHTING POWER DENSITY

☐

C406.4 ENHANCED DIGITAL LIGHTING CONTROLS

☐

C406.5 ON-SITE RENEWABLE ENERGY

☐

C406.6 DEDICATED OUTDOOR AIR SYSTEM

☐

C406.7 REDUCED ENERGY USE IN SERVICE WATER HEATING

LIGHTING SCHEDULE

LAMP TYPE REQUIRED IN FIXTURE

NUMBER OF LAMPS IN FIXTURE

BALLAST TYPE USED IN FIXTURE

NUMBER OF BALLASTS IN FIXTURE

TOTAL WATTAGE PER FIXTURE

SEE LIGHT FIXTURE SCHEDULE

TOTAL INTERIOR WATTAGE SPECIFIED VS. ALLOWED N/A
EXTERIOR EFFICIENCY 4.635kW (ALLOWED) VS. 1.423kW (SPECIFIED)

EQUIPMENT SCHEDULES WITH MOTORS (NOT USED FOR MECHANICAL SYSTEMS)

MOTOR HORSEPOWER	<u>N/A</u>
NUMBER OF PHASES	<u>N/A</u>
MINIMUM EFFICIENCY	<u>SEAL</u>
MOTOR TYPE	<u>N/A</u>
NUMBER OF POLES	<u>N/A</u>

ELECTRICAL DESIGNER STATEMENT

TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE DESIGN OF THIS BUILDING COMPLIES WITH THE ELECTRICAL SYSTEM AND EQUIPMENT REQUIREMENTS OF THE NORTH CAROLINA ENERGY CODE 2018 EDITION

TELECOMMUNICATIONS GENERAL NOTES

1.

ALL TELECOMMUNICATIONS WORK INDICATED ON THE DRAWINGS AND / OR SPECIFICATIONS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST REQUIREMENTS OF THE CITY, COUNTY, AND STATE BUILDING CODES, THE LATEST BICSI TISMA, THE NATIONAL ELECTRICAL CODE (NEC), AND THE LOCAL AUTHORITY HAVING JURISDICTION.

2.

THESE PLANS ARE DIAGRAMMATIC AND SHOW THE GENERAL LOCATION OF DEVICES, EQUIPMENT, PIPE ROUTING, ETC. ALL WORK SHALL BE COORDINATED WITH ALL OTHER TRADES PRIOR TO INSTALLATION. CONTRACTOR SHALL COORDINATE INSTALLATION/ROUTING OF ALL WORK WITH EXISTING CONDITIONS AND OTHER TRADES WORK PRIOR TO ROUGH-IN. CONTRACTOR SHALL PROVIDE ALL NECESSARY ANCILARY DEVICES REQUIRED FOR A COMPLETE AND COORDINATED INSTALLATION.

3.

ALL EXISTING INFORMATION SHOWN IS BASED ON NON-DESTRUCTIVE FIELD INVESTIGATION AND/OR EXISTING DRAWING INFORMATION. DURING THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE A/E OF ANY HIDDEN CONDITIONS FOUND THAT REQUIRE CORRECTIVE ACTION BEYOND THE CONTRACTOR'S SCOPE OF WORK. ALL FIELD CORRECTIONS SHALL BE RED-LINED ON CONSTRUCTION DOCUMENTS AND THE AS-BUILTS SHALL BE TURNED OVER TO THE A/E UPON CONTRACT COMPLETION. PRIOR TO BEGINNING ANY WORK AS INDICATED ON THE PLANS, THE CONTRACTOR SHALL ENSURE THAT ALL WORK IS PLANNED AND COORDINATED WITH ALL TRADES AND THE OWNER.

4.

IF CONTRACTOR NOTICES THAT NECESSARY INFORMATION IS ABSENT ON DRAWINGS OR IN SPECIFICATIONS, SUCH THAT CONTRACTOR IS UNSURE OF MATERIALS, SIZING, OR ROUTING OF SYSTEMS, THEN IT IS IMPERATIVE THAT THE CONTRACTOR CONTACT THE ENGINEER DURING BID OR PRIOR TO ROUGH-IN TO REQUEST CLARIFICATION. IF CONTRACTOR PROCEEDS WITH INSTALLATION WITHOUT DIRECTION FROM THE ENGINEER, THEN CONTRACTOR ASSUMES ALL COST ASSOCIATED WITH HIS ACTIONS AND RESPONSIBILITY FOR THE FUNCTION OF SYSTEM.

5.

SUBMIT 4 COPIES OF PRODUCT AND CAPACITY DATA FOR SPECIFIED EQUIPMENT TO THE ARCHITECT / ENGINEER BEFORE ORDERING EQUIPMENT. IF CONTRACTOR ELECTS TO IGNORE REQUIREMENT FOR SUBMITTAL INFORMATION, OR IF SUBMITTAL IS RECEIVED AFTER INSTALLATION OF EQUIPMENT, THEN CONTRACTOR ASSUMES ALL COSTS ASSOCIATED WITH SUBSTITUTION AND RESPONSIBILITY FOR OPERATION, FUNCTION, AND COORDINATION OF EQUIPMENT PURCHASED.

6.

IF ALTERNATE EQUIPMENT IS USED OTHER THAN WHAT IS SPECIFIED ON THE DRAWINGS, THE CONTRACTOR SHALL COORDINATE THE REQUIREMENTS OF THAT EQUIPMENT WITH ALL OTHER TRADES. THIS COORDINATION SHALL OCCUR PRIOR TO ROUGH-IN OF ANY TRADES EQUIPMENT. ALL REVISION WORK REQUIRED TO COORDINATE ANY EQUIPMENT SUBSTITUTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

7.

ALL PIPE PENETRATIONS THROUGH FIRE-RATED WALLS OR FLOORS SHALL BE SEALED PER U.L. DETAILS SHOWN ON DRAWINGS. ALL PIPE PENETRATIONS THROUGH NON-RATED WALLS OR FLOORS SHALL BE SEALED WITH THE APPROPRIATE WALL/FLOOR MATERIALS PER THE ARCHITECTURAL SPECIFICATIONS. ALL PIPE PENETRATIONS THROUGH EXTERIOR WALLS SHALL BE SEALED WITH MATERIALS PER THE ARCHITECTURAL SPECIFICATIONS AND WATERPROOFED TO PREVENT MOISTURE FROM ENTERING THE BUILDING. ALL ROOF PENETRATIONS SHALL BE FLASHED AND MADE WATERTIGHT IN A MANNER THAT IS CONSISTENT WITH ROOF CONSTRUCTION AND APPROVED BY THE ROOF MATERIAL MANUFACTURER SO AS NOT TO VOID THE ROOF WARRANTY. ALL WALL, FLOOR AND ROOF PENETRATIONS AND SEALING OF PENETRATIONS SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR.

8.

CONTRACTOR SHALL PROVIDE FIRE PREVENTION SYSTEM FOR ANY ANNULAR OPENINGS OF PATHWAYS AFTER CABLES HAVE BEEN INSTALLED AND TESTED.

9.

WHERE THE WORD 'PROVIDE' IS USED, IT SHALL BE DEFINED TO MEAN THAT THE DEVICE / EQUIPMENT INDICATED SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR, UNLESS OTHERWISE NOTED.

10.

ALL MANUFACTURER'S MINIMUM WORKING CLEARANCE RECOMMENDATIONS SHALL BE MAINTAINED ON ALL EQUIPMENT.

11.

THE CONTRACTOR SHALL SUBMIT TO THE ARCHITECT / ENGINEER A COMPLETE SET OF AS-BUILT PLANS INDICATING ALL CHANGES ENCOUNTERED DURING CONSTRUCTION.

12.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND SHALL NOTIFY LOCAL INSPECTION DEPARTMENTS AS WORK PROGRESSES.

13.

CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE A/E TO SCHEDULE ALL REQUIRED INSPECTIONS INCLUDING: NO WORK SHALL BE COVERED UP UNTIL AFTER THE INSPECTION HAS BEEN COMPLETED AND APPROVED BY AN AUTHORIZED INSPECTOR.

14.

MOUNTING HEIGHTS FOR ALL WALL MOUNTED TELECOMMUNICATION DEVICES SHALL BE AS INDICATED ON THE 'DEVICE MOUNTING HEIGHT' SCHEDULE, UNLESS NOTED OTHERWISE.

15.

TELECOMMUNICATIONS CONDUIT SHALL HAVE A MAXIMUM FILL RATIO OF 40%.

16.

TELECOMMUNICATIONS CABLE TRAYS AND TROUGHS SHALL HAVE AN INITIAL FILL RATIO OF 25% AND A MAXIMUM FILL RATIO OF 50%.

17.

CONTRACTOR SHALL ENSURE THAT TELECOMMUNICATIONS CONDUIT IS NOT INSTALLED ADJACENT TO ANY HEAT SOURCE SUCH AS BOILERS, HEATERS (GAS OR ELECTRIC), HOT WATER LINES, STEAM LINES, ETC.

18.

ALL EMPTY TELECOMMUNICATIONS CONDUITS SHALL BE PROVIDED WITH PULL STRING THAT HAS MINIMUM TEST RATINGS OF 200 LBS.

19.

TELECOMMUNICATIONS CONDUIT ENDS SHALL BE REAMED AND FIT WITH INSULATED THROAT BUSHINGS.

20.

PROVIDE PULL STRING ALONG WITH CABLING WHERE INSTALLED IN CONDUIT 2' AND LARGER.

21.

ALL FLOOR SLEEVES AND CONDUIT PENETRATIONS THROUGH FLOORS MUST PROTRUDE A MINIMUM OF 4" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.

22.

CABLES INSTALLED IN THE CEILING CAVITY SHALL BE PLENUM RATED UNLESS OTHERWISE NOTED.

23.

CABLES INSTALLED IN CONDUIT BELOW SLAB OR UNDERGROUND SHALL BE RATED FOR WET LOCATIONS.

24.

CABLING SHALL NOT BE LAID DIRECTLY ON THE CEILING GRID OR SUSPENDED FROM THE CEILING OR LIGHT FIXTURE. HANGER WIRES IN ACCORDANCE WITH BICSI STANDARDS AND PER NEC ARTICLE 300.11 CABLES ARE NOT PERMITTED TO BE DIRECTLY ON ANY DUCTWORK OR HVAC EQUIPMENT. CABLING SHALL BE SUPPORTED FROM THE STRUCTURE.

25.

TELECOMMUNICATION CABLEING SHALL MAINTAIN A MINIMUM 12" CLEARANCE FROM ALL LIGHT FIXTURES AND ANY EMI INDUCING EQUIPMENT.

26.

CONTRACTOR SHALL USE DESIGNATED SECTIONS OF CABLE TRAY AND CONDUIT SLEEVES AS PATHWAYS FOR TELECOMMUNICATIONS CABLING THROUGHOUT THE BUILDING. IN AREAS WHERE SUPPORT STRUCTURES ARE NOT AVAILABLE, CABLE SHALL BE SUPPORTED BY METALLIC OR PLASTIC PLENUM RATED J-HOOKS MOUNTED AT INTERVALS OF 5 FEET OR LESS. J-HOOK INSTALLATION SHALL BE SUCH THAT TELECOMMUNICATIONS CABLING MAINTAINS A MINIMUM 3 INCH VERTICAL CLEARANCE FROM ANY CEILING GRID / TILE. TELECOMMUNICATIONS CABLING SHALL NOT BE ROUTED WHERE SUSCEPTIBLE TO DAMAGE OR EMI. CABLES SHALL BE NEATLY BUNDLED WHERE INSTALLED UTILIZING J-HOOKS.

27.

HORIZONTAL DISTRIBUTION CABLES SHALL BE BUNDLED IN GROUPS OF NO MORE THAN 48 CABLES. BUNDLE CABLES OF THE SAME COLOR / NETWORK TOGETHER AS APPROPRIATE. BUNDLE BACKBONE CABLES SEPARATELY FROM HORIZONTAL CABLES. MATERIALS USED TO BUNDLE CABLES SHALL BE INTENDED FOR THE PURPOSE AND SHALL NOT DAMAGE THE CABLES.

28.

INSTALL BONDING FOR ALL CABLE RUNWAY, RACKS, AND EQUIPMENT IN RACKS AS INDICATED ON THE DRAWINGS AND IN ACCORDANCE WITH TIA-607. REFER TO GROUNDING DETAILS FOR ADDITIONAL REQUIREMENTS.

29.

ALL HORIZONTAL COPPER, FIBER, AND COAXIAL CABLE INSTALLATIONS SHALL PROVIDED IN ACCORDANCE WITH THE LATEST TIA-608 STANDARDS.

30.

TELECOMMUNICATIONS LABELING SHALL PROVIDED IN ACCORDANCE WITH THE LATEST TIA / EIA-606 REQUIREMENTS AND FACILITY STANDARDS.

31.

PROVIDE TELECOMMUNICATIONS OUTLETS IN UTILITY ROOMS FOR CONNECTION TO BAS / UTILITY MANAGEMENT SYSTEMS. COORDINATE CABLING REQUIREMENTS AND MOUNTING LOCATION(S) WITH CONTROLS CONTRACTOR AND OWNER PRIOR TO ROUGH-IN.

32.

PROVIDE TELECOMMUNICATIONS OUTLET(S) IN ELEVATOR CONTROL ROOMS AS REQUIRED. COORDINATE EXACT NUMBER AND MOUNTING LOCATIONS WITH ELEVATOR CONTRACTOR PRIOR TO ROUGH-IN.

Drawing List

E0.1

ELECTRICAL LEGEND AND ABBREVIATIONS AND NOTES

E0.2

SPECIFICATIONS AND NOTES

E1.1

PARKING LOT ELECTRICAL PLAN

E1.2

PARKING LOT SECURITY PLAN

E4.1

ELECTRICAL DIAGRAMS AND SCHEDULES

E4.2

ELECTRICAL DIAGRAMS

E5.1

ELECTRICAL SINGLE LINE DIAGRAM

E6.1

ELECTRICAL PANEL SCHEDULES

BUY AMERICA PROGRAM REQUIREMENTS

ALL PRODUCTS PROVIDED ON THIS PROJECT MUST BE MANUFACTURED IN COMPLIANCE WITH THE BUY AMERICA PROGRAM FOR FEDERALLY FUNDED TRANSPORTATION PROJECTS PER CODE OF FEDERAL REGULATIONS 49 CFR 661. THESE REQUIREMENTS ARE DISTINCT AND DIFFERENT FROM THOSE OF THE BUY AMERICAN ACT OF 1933.

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EDI Project Number: 005-23

EAST RALEIGH PARK AND RIDE
100% CONSTRUCTION DRAWINGS
1426 WILDERS GROVE LN. AND
1451 N. HOPE RD.
RALEIGH, NC

REVISIONS

NO. DATE

PLAN INFORMATION

PROJECT NO. RAL22005
FILENAME
CHECKED BY JDL
DRAWN BY CAM
SCALE AS NOTED
DATE 10.07.2025

TITLE

ELECTRICAL LEGEND,
ABBREVIATIONS AND
NOTES

E0.1

ELECTRICAL SPECIFICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. ALL WORK INDICATED ON DRAWINGS/SPECIFICATIONS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST REQUIREMENTS OF THE CITY, COUNTY AND STATE BUILDING CODES, AND THE LOCAL AUTHORITY HAVING JURISDICTION.
- B. THESE PLANS ARE DIAGRAMMATIC AND SHOW THE GENERAL LOCATION OF DEVICES, EQUIPMENT, PIPE ROUTING, ETC. ALL WORK SHALL BE COORDINATED WITH ALL OTHER TRADES PRIOR TO INSTALLATION. CONTRACTOR SHALL COORDINATE INSTALLATION/ROUTING OF ALL WORK WITH EXISTING CONDITIONS AND OTHER TRADES WORK PRIOR TO ROUGH-IN. CONTRACTOR SHALL PROVIDE ALL NECESSARY ANCILLARY DEVICES REQUIRED FOR A COMPLETE AND COORDINATED INSTALLATION.
- C. ALL EXISTING INFORMATION SHOWN IS BASED ON NON-DESTRUCTIVE FIELD INVESTIGATION AND/OR EXISTING DRAWING INFORMATION. DURING THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE A/E OF ANY HIDDEN CONDITIONS FOUND THAT REQUIRE CORRECTIVE ACTION BEYOND THE CONTRACTOR'S SCOPE OF WORK. ALL FIELD CORRECTIONS SHALL BE RED-LINED ON CONSTRUCTION DOCUMENTS AND THE AS-BUILTS SHALL BE TURNED OVER TO THE A/E UPON CONTRACT COMPLETION.
- D. IF CONTRACTOR NOTICES THAT NECESSARY INFORMATION IS ABSENT ON DRAWINGS OR IN SPECIFICATIONS, SUCH THAT CONTRACTOR IS UNSURE OF MATERIALS, SIZING, OR ROUTING OF SYSTEMS, THEN IT IS IMPERATIVE THAT THE CONTRACTOR CONTACT THE ENGINEER DURING BID OR PRIOR TO ROUGH-IN TO REQUEST CLARIFICATION. IF CONTRACTOR PROCEEDS WITH INSTALLATION WITHOUT DIRECTION FROM THE ENGINEER, THEN CONTRACTOR ASSUMES ALL COST ASSOCIATED WITH HIS ACTIONS AND RESPONSIBILITY FOR THE FUNCTION OF SYSTEM.
- E. SUBMIT ELECTRONIC COPIES OF PRODUCT AND CAPACITY DATA FOR SPECIFIED EQUIPMENT TO THE ARCHITECT/ENGINEER BEFORE ORDERING EQUIPMENT. IF CONTRACTOR ELECTS TO IGNORE REQUIREMENT FOR SUBMITTAL INFORMATION, OR IF SUBMITTAL IS RECEIVED AFTER INSTALLATION OF EQUIPMENT, THEN CONTRACTOR ASSUMES ALL COSTS ASSOCIATED WITH SUBSTITUTION AND RESPONSIBILITY FOR OPERATION, FUNCTION, AND COORDINATION OF EQUIPMENT PURCHASED.
- F. IF ALTERNATE EQUIPMENT IS USED OTHER THAN WHAT IS SPECIFIED ON THE DRAWINGS, THE CONTRACTOR SHALL COORDINATE THE REQUIREMENTS OF THAT EQUIPMENT WITH ALL OTHER TRADES. THIS COORDINATION SHALL OCCUR PRIOR TO ROUGH-IN OF ANY TRADES EQUIPMENT. ALL REVISION WORK REQUIRED TO COORDINATE ANY EQUIPMENT SUBSTITUTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
- G. ALL PIPE PENETRATIONS THROUGH FIRE-RATED WALLS OR FLOORS SHALL BE SEALED BE SEALED IN ACCORDANCE WITH LISTED THROUGH PENETRATION SYSTEM DETAILS(S) APPLICABLE FOR THE PENETRATION TYPE AND WALL/FLOOR CONSTRUCTION ENCOUNTERED. ALL PIPE PENETRATIONS THROUGH NON-RATED WALLS OR FLOORS SHALL BE SEALED WITH THE APPROPRIATE WALL/FLOOR MATERIALS PER THE ARCHITECTURAL SPECIFICATIONS. ALL PIPE PENETRATIONS THROUGH EXTERIOR WALLS SHALL BE SEALED WITH MATERIALS PER THE ARCHITECTURAL SPECIFICATIONS AND WATERPROOFED TO PREVENT MOISTURE FROM ENTERING THE BUILDING. ALL ROOF PENETRATIONS SHALL BE FLASHED AND MADE WATERTIGHT IN A MANNER THAT IS CONSISTENT WITH ROOF CONSTRUCTION AND APPROVED BY THE ROOF MATERIAL MANUFACTURER. SO AS NOT TO VOID THE ROOF WARRANTY. ALL WALL, FLOOR AND ROOF PENETRATIONS AND SEALING OF PENETRATIONS SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR.
- H. WHERE THE WORD 'PROVIDE' IS USED, IT SHALL BE DEFINED TO MEAN THAT THE DEVICE/EQUIPMENT INDICATED SHALL BE 'FURNISHED AND INSTALLED' BY THE CONTRACTOR, UNLESS OTHERWISE NOTED.
- I. ALL MANUFACTURER'S MINIMUM WORKING CLEARANCE RECOMMENDATIONS SHALL BE MAINTAINED ON ALL EQUIPMENT. CONTRACTOR SHALL ENSURE THAT ALL NEC ACCESSIBILITY REQUIREMENTS AND DEDICATED WORK SPACE CLEARANCES ARE MAINTAINED. THIS SHALL INCLUDE, BUT IS NOT LIMITED TO LOCATIONS / ACCESS FOR PANELBOARDS, DISCONNECTS, JUNCTION BOXES, EQUIPMENT, ETC. JUNCTION BOXES SHALL NOT BE LOCATED ABOVE FIXED EQUIPMENT, HARD CEILINGS, ETC. WHERE THEY CANNOT BE READILY ACCESSED BY A FLOOR LADDER, WHERE REQUIRED TO BE LOCATED ABOVE HARD CEILINGS, CONTRACTOR SHALL PROVIDE APPROPRIATE ACCESS PANELS / OPENINGS.
- J. THE CONTRACTOR SHALL SUBMIT TO THE ARCHITECT/ENGINEER A COMPLETE SET OF AS-BUILT PLANS INDICATING ALL CHANGES ENCOUNTERED DURING CONSTRUCTION.
- K. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND SHALL NOTIFY LOCAL INSPECTION DEPARTMENTS AS WORK PROGRESSES.
- L. MOUNTING HEIGHTS FOR ALL WALL MOUNTED ELECTRICAL DEVICES SHALL BE AS INDICATED ON THE TYPICAL DEVICE MOUNTING HEIGHTS SCHEDULE SHOWN ON HEREIN, UNLESS NOTED OTHERWISE.

PART 2 - PRODUCT/EXECUTION

2.1 LIGHTING FIXTURES

- A. INSTALL ALL LIGHTING FIXTURES AS SPECIFIED ON THE DRAWINGS. FIXTURES SHALL BE FURNISHED BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED.
- B. ALL LAMPS SHALL BE INSTALLED BY THE CONTRACTOR. LAMPS SHALL BE AS SPECIFIED IN THE LIGHT FIXTURE SCHEDULE ON THE DRAWINGS. LAMPS SHALL BE THOSE MANUFACTURED BY GENERAL ELECTRIC, SYLVANIA OR PHILLIPS.
- C. ALL L.E.D. FIXTURES:
- COMPLY WITH UL 1598. COMPLY WITH ANSI C78-377-2008, IESNA LM-79, AND IESNA LM-80.
 - FIXTURES SHALL HAVE A POWER FACTOR OF NO LESS THAN 0.9 (90%).
 - FIXTURES SHALL HAVE A MAXIMUM OF 20% HARMONIC DISTORTION.
 - FIXTURES SHALL HAVE A MINIMUM SURGE PROTECTION OF 2.5KA INTEGRAL TO DRIVER.
 - FIXTURES SHALL BE LISTED BY ONE OF THE FOLLOWING AGENCIES' WEBSITE:
- I. LIGHTINGFACTS.COM
II. ENGERYSTAR.GOV
III. DESIGNLIGHTS.ORG
- D. A 10 YEAR WARRANTY SHALL BE PROVIDED FOR ALL FIXTURES WITH NON-MODULAR (NON-REPLACEABLE) DRIVERS.
- D. A 5 YEAR WARRANTY SHALL BE PROVIDED FOR ALL FIXTURES WITH MODULAR (REPLACEABLE) DRIVERS.

2.2 WIRING DEVICES

- A. STANDARD DUPLEX RECEPTACLES SHALL BE HUBBELL #HBL5362, PASS & SEYMOUR #5362A OR LEVITON #5362A.
- B. WIRING DEVICE COVERPLATES, WHERE CONDUIT IS EXPOSED, THE PLATES SHALL BE GALVANIZED OR CAST METAL TO SUIT THE OUTLET BOX USED.

2.3 CONDUIT

- A. ALL CONDUIT 3/4" THROUGH 4" AND CONCEALED IN WALLS AND ABOVE CEILINGS SHALL BE EMT. ALL OTHER CONDUIT SHALL BE RIGID HOT DIPPED GALVANIZED (GRS) OR HEAVY WALL CONDUIT (HWC). CONDUIT IS TO BE MADE UP TIGHT WITH THREADED COUPLINGS WITH FULL THREADS EMPLOYED IN THE CONDUIT. ALL SHALL BE SQUARE CUT AND REAMED TO REMOVE ANY SHOULDERS OR BURRS. BENDS OR OFFSETS SHALL BE MADE WITH STANDARD CONDUIT ELLS OR FIELD BENDS MADE WITH AN APPROVED BENDER OR HICKEY OR HUB TYPE CONDUIT FITTINGS. NUMBER OF BENDS SHALL CONFORM TO NEC. EMT CONDUIT SHALL HAVE A CORROSION RESISTANT INNER AND OUTER COATING AND A SMOOTH INNER SURFACE. EMT SHALL BE UL APPROVED. EMT COUPLING AND CONNECTORS SHALL BE WATERTIGHT COMPRESSION TYPE WITH AN INSULATED THROAT.
- B. ALL CONDUIT MUST BE NEATLY ARRANGED, PROPERLY ALIGNED AND SUPPORTED. CONDUIT SHALL BE KEPT AT LEAST SIX (6) INCHES FROM FLUES, STEAM PIPES, OR HOT WATER PIPES WHERE POSSIBLE.
- C. CONCEALED CONDUITS SHALL BE RUN IN A DIRECT LINE WITH LONG SWEEP BENDS AND OFFSETS. EXPOSED CONDUITS SHALL BE RUN PARALLEL TO AND AT RIGHT ANGLES TO BUILDING LINES.
- D. ALL CONDUIT RUNS UNDERGROUND OR IN FLOOR SLAB SHALL BE PVC SCHEDULE 40. UNDERGROUND CONDUIT SHALL TRANSITION TO METAL CONDUIT PRIOR TO EXITING GRADE.
- E. ALL CONDUIT JOINTS SHALL BE WATER TIGHT AND FREE FROM OBSTRUCTIONS, CLEANED AND DRY BEFORE PULLING CONDUCTORS. THE CONTRACTOR SHALL EXERCISE NECESSARY PRECAUTIONS TO PREVENT DIRT, PLASTER, OR TRASH IN CONDUIT, FITTINGS, AND BOXES DURING THE COURSE OF FIELD INSTALLATION. ALL CONDUIT ENDS SHALL BE PLUGGED WITH APPROVED CONDUIT SEALS AS SOON AS INSTALLED AND SHALL NOT BE WITHDRAWN UNTIL ALL CONCRETE WORK, MASONRY WORK, AND PLASTERING IS COMPLETED.
- F. CONDUITS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET, FROM OUTLETS TO CABINETS, PULL OR JUNCTION BOXES AND SHALL BE SECURED TO ALL BOXES WITH LOCKOUTS AND BUSHING IN SUCH MANNER THAT EACH SYSTEM SHALL BE ELECTRICALLY CONTINUOUS THROUGHOUT.
- G. CONDUIT TERMINALS AT CABINETS AND BOXES SHALL BE RIGIDLY SECURED WITH DOUBLE LOCKNUTS AND BUSHINGS AS REQUIRED BY THE NEC AND LOCAL ELECTRICAL CODE. ON ALL CONDUIT 1-1/4" TRADE SIZE AND LARGER, BUSHINGS SHALL BE OZ. TYPE B.
- H. ERICKSON COUPLINGS MAY BE USED IN CONDUIT, BUT UNIONS WILL NOT BE PERMITTED, RUNNING THREADS WILL NOT BE PERMITTED.
- I. FITTINGS FOR METAL CONDUIT SHALL COMPLY WITH NEMA FB 1 AND UL 514B. FITTINGS FOR EMT SHALL BE STEEL PLATED HEXAGONAL COMPRESSION FITTINGS/COUPLINGS. NO POT METAL. SET SCREW OR INDENTED FITTINGS TYPE FITTINGS/COUPLINGS SHALL BE UTILIZED.
- J. WHERE CONDUITS ARE RUN FROM INDOOR TO OUTDOOR CONDUITS SHALL BE SEALED WITH VAPOR SEAL COMPOUND OR AT A POINT OF ENTRY INTO BUILDING OR BUILDINGS IN ACCORDANCE WITH NEC ARTICLE 230.8.
- K. WHERE FLEXIBLE CONDUIT IS USED, IT SHALL BE SEAL TIGHT FLEX. FITTINGS FOR FLEX SHALL BE CROUSE HINDS TYPE T & B.
- L. ALL CONDUIT TERMINATIONS SHALL HAVE NYLON INSERT THROAT BUSHINGS INSTALLED. BUSHINGS SHALL BE INSTALLED PRIOR TO CONDUCTOR INSTALLATION. CUT BUSHINGS SHALL NOT BE ALLOWED.
- M. ALL CONDUIT PENETRATIONS THRU ELECTRICAL/MECHANICAL EQUIPMENT ENCLOSURES SHALL BE PROPERLY SEALED SO AS NOT TO VOID THE U.L. LISTING OR INTEGRITY OF THE FACTORY ENCLOSURE.
- N. ALL EMPTY CONDUIT SHALL BE PROVIDED WITH PULLSTRINGS AND LABELS ON EACH END TO INDICATE THEIR INTENDED USE.

2.4 PULL BOXES AND JUNCTION BOXES

- A. FURNISH AND INSTALL PULL BOXES WHERE NECESSARY AND AS SHOWN ON THE DRAWINGS IN THE RACEWAY SYSTEM TO FACILITATE CONDUCTOR INSTALLATION. IN GENERAL, CONDUIT RUNS OF MORE THAN 100 FT. OR WITH MORE THAN THREE RIGHT-ANGLE BENDS SHALL HAVE A PULLBOX INSTALLED AT A CONVENIENT INTERMEDIATE LOCATION. ALL BOXES SHALL BE MADE OF GALVANIZED STEEL OR METAL GAUGE AND PHYSICAL SIZE AS REQUIRED BY THE NEC FOR THE NUMBER AND SIZE OF CONDUITS AND CONDUCTORS INVOLVED. UNLESS SPECIFIED OTHERWISE, BOXES SHALL HAVE REMOVABLE SCREW COVER FOR INSTALLATION. BOXES SHALL BE SECURELY MOUNTED TO THE BUILDING STRUCTURE WITH SUPPORTING FASTENERS INDEPENDENT OF THE CONDUITS ENTERING OR LEAVING THE BOXES. WHEN SEVERAL CONDUCTORS PASS THROUGH A COMMON PULL BOX, THEY SHALL BE TAGGED TO INDICATE CLEARLY THEIR ELECTRICAL CHARACTERISTICS, CIRCUIT NUMBER AND PANEL DESIGNATION. IN NO CASE SHALL THE PULL BOX BE INSTALLED IN AN INACCESSIBLE LOCATION.
- B. PROVIDE INTERIOR BOXES OF GALVANIZED STEEL WITH GALVANIZED STEEL COVERS PER NEMA OS-1, AND LISTED UNDER UL-614.
- C. PROVIDE EXTERIOR BOXES OF TYPE FD FERROALLOY PER NEMA FB-1, WITH GASKETED COVER AND THREADED HUBS.

2.5 CONDUCTORS

- A. CONDUCTORS SHALL BE SOFT-DRAWN COPPER AND THIRD-PARTY LISTED UNLESS OTHERWISE NOTED, WITH THWN / THWN-2 INSULATION UNLESS OTHERWISE NOTED. CONDUCTOR SIZES SHALL BE STANDARD AMERICAN WIRE GAUGE SIZES. CONDUCTORS AND EQUIPMENT TERMINALS SHALL BE RATED AT 75 DEGREE CELSIUS. WHERE EQUIPMENT PROVIDED DOES NOT HAVE TERMINALS RATED AT 75 DEGREE CELSIUS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ADJUSTMENTS TO CONDUCTOR AND CONDUIT SYSTEMS ACCORDINGLY BASED ON THE NEC FOR THE EQUIPMENT'S RATING.
- B. WIRE AND CABLE SHALL BE FACTORY COLOR-CODED, WITH A SEPARATE COLOR FOR EACH PHASE AND NEUTRAL USED CONSISTENTLY THROUGHOUT THE SYSTEM. DIFFERENT COLORS SHALL BE USED FOR 120/208V SYSTEM AND SHALL BE CONSISTENT THROUGHOUT THE SYSTEM.
- C. CONDUCTORS INTENDED SOLELY FOR GROUNDING PURPOSES SHALL BE GREEN OR BARE, AS REQUIRED BY THE NEC. COLORS FOR THE DIFFERENT VOLTAGE SYSTEMS SHALL BE IDENTIFIED WITH DIFFERENT COLOR SCHEMES AND NEUTRAL OR GROUNDED CONDUCTORS SHALL BE GREY OR WHITE CORRESPONDINGLY WITH EACH VOLTAGE SYSTEM. ANY CONDUCTOR IDENTIFIED SOLELY FOR GROUNDING SHALL BE IDENTIFIED BY A GREEN COLOR. ALL CONDUITS SHALL CONTAIN A GREEN GROUNDING CONDUCTOR.
- D. UNLESS SPECIFICALLY NOTED OTHERWISE, THE MINIMUM WIRE SIZE SHALL BE #12 AWG, EXCEPT THAT CONTROL WIRING MAY BE #14 AWG OR #16 AWG AS NOTED ON PLANS. ALL CONDUCTORS (POWER / CONTROL) SHALL BE INSTALLED IN CONDUIT UNLESS SPECIFICALLY NOTED OTHERWISE.
- E. CONDUCTORS #8 AND SMALLER SHALL BE TYPE THWN-THHN, #6 AND LARGER SHALL BE CLP TYPE XHHW 90 DEGREE INSTALLATION, OKONITE X-OLENE PRODUCT GROUP 11232, OR EQUAL, IS ACCEPTABLE.
- F. CONTROL CONDUCTORS SHALL BE TAGGED OR IDENTIFIED AT EACH END ACCORDING TO DRAWINGS. ALL CONDUCTORS NOT IDENTIFIED ON DRAWINGS SHALL BE SYSTEMATICALLY TAGGED AND NOTED ON PRINT.
- G. WHERE CONDUCTORS ARE RUN IN PARALLEL BOTH CONDUCTORS ARE TO BE TAPPED WHERE BRANCH CIRCUITS ARE TAKEN OFF.
- H. CONDUCTORS #10 AND SMALLER SHALL BE TERMINATED WITH STA-KON OR EQUAL PRESSURE TYPE TERMINALS.
- I. SPLICING OF CONDUCTORS SHALL BE HELD TO A MINIMUM. CONDUCTOR RUNS LESS THAN 30' IN LENGTH SHALL NOT BE SPLICED. THOSE SPlice CONNECTIONS SHALL BE DOCUMENTED ON DRAWINGS AS TO LOCATION, WIRE TYPE, AND SPlice METHOD. FOR INSPECTION PRIOR TO (PUNCH LIST) CLOSEOUT OF PROJECT, ALL CONDUCTOR SPLICES (WHERE ALLOWED) OR TAPS SHALL BE MADE WITH COMPRESSION/CRIMP TYPE FITTINGS AND COVERED WITH NYLON COVER CAPS UNLESS OTHERWISE NOTED. WIRE NUTS OR TAPING OF SPLICES/TAPS SHALL NOT BE ALLOWED.
- L. ALL EQUIPMENT FEEDERS SHALL BE CONTINUOUS FROM THE DISCONNECT SWITCH TO THE MOTOR/EQUIPMENT TAP BOX. SPLICES SHALL NOT BE ALLOWED.
- M. NEC SECTION 210.4D REQUIRES SEPARATE AND DISTINCT COLOR CODING ON MULTI-VOLTAGE SYSTEMS. PANELBOARDS SHALL BE CLEARLY MARKED. THE IDENTIFICATION SHALL BE BY COLOR CODE OR TAGGING IN A CONSISTENT MANNER.
- N. ALL CONDUCTORS INTERNAL TO ELECTRICAL EQUIPMENT SHALL BE NEATLY TIE WRAPPED WITH NYLON TIE WRAPS. CONDUCTORS SHALL BE ROUTED PARALLEL & VERTICAL TO ENCLOSURE SIDES. ALL SHARP EDGES ON CUT TIE WRAPS SHALL BE REMOVED.
- O. CONTRACTOR MAY USE TYPE MC CABLE IN LIEU OF CONDUIT AND CONDUCTORS WHERE ALLOWED BY LOCAL CODES AND THE NATIONAL ELECTRICAL CODE. IF TYPE MC CABLE IS USED, CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY FOR RESIZING ANY CIRCUITS SHOWN.

2.6 CONDUIT SUPPORT

- A. EXPOSED CONDUITS SHALL BE SECURELY FASTENED IN PLACE ON MAXIMUM 8FT. INTERVALS, UNLESS SPECIFIED OTHERWISE, AND HANGERS, SUPPORTS OR FASTENINGS SHALL BE PROVIDED AT EACH ELBOW AND AT END OF EACH STRAIGHT RUN TERMINATION AT BOX OR CABINET. UNLESS SPECIFIED OTHERWISE, HORIZONTAL AND VERTICAL CONDUIT RUNS MAY BE SUPPORTED BY TWO MALLEABLE STRAPS, BEAM CLAMPS, OR OTHER APPROVED DEVICES WITH SUITABLE BOLTS AND EXPANSION SHIELDS FOR MOUNTING TO BUILDING STRUCTURE OR SPECIAL BRACKETS.
- B. HANGERS AND CLAMPS SHALL BE MADE OF DURABLE MATERIALS SUITABLE FOR THE APPLICATION INVOLVED. HANGER ASSEMBLIES SHALL BE PROTECTED BY GALVANIZING, OR OTHER SUITABLE PRESERVATION METHODS TO PREVENT CORROSION. THE REQUIRED STRENGTH OF THE SUPPORTING EQUIPMENT AND SIZE AND TYPE OF ANCHORS SHALL BE BASED ON THE COMBINED WEIGHT OF CONDUIT, HANGER AND CABLES.
- C. WHERE AN INDIVIDUALLY MOUNTED SAFETY SWITCH, STARTER, OR CIRCUIT BREAKER IS SHOWN ADJACENT TO ITS RESPECTIVE LOAD AND NOT MOUNTED ON A WALL, PROVIDE ALL SUPPORTS, BRACKET, ANCHORING, ETC. NECESSARY TO PROPERLY SUPPORT THE DEVICE.

2.7 GROUNDING

- A. EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE, ALL EXPOSED NON-CURRENT CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, RACEWAY SYSTEMS AND NEUTRAL CONDUCTOR OF THE WIRING SYSTEM SHALL BE GROUNDED.
- B. EACH RACEWAY FOR ALL POWER SYSTEMS AND BRANCH CIRCUITS SHALL HAVE A SEPARATE GROUNDING CONDUCTOR.
- C. SPECIFIC ITEMS TO BE GROUNDED ARE LISTED BELOW. THIS LIST IS NOT COMPLETE, BUT GENERALLY DESCRIBES THE GROUNDING OF MAJOR ITEMS THAT MAY OR MAY NOT HAVE THE GROUND INDICATED. THESE GROUNDS ARE TO BE INSTALLED EVEN THOUGH NOT SPECIFICALLY SHOWN OR INDICATED ON THE PLANS.
- GROUNDING FOR ALL ELECTRICAL EQUIPMENT WITHIN REACH OF METALLIC PLUMBING OR EXPOSED CONCRETE FLOORS IN DIRECT CONTACT WITH THE EARTH SHALL BE PROVIDED.
 - PANELBOARDS, TRANSFORMERS, WIRING GUTTERS, AND TELEPHONE BACKBOARDS.
 - MOTORS, MOTOR STARTERS, AND MOTOR CONTROLS.
- D. GROUNDING TYPE RECEPTACLES AND LIGHTING FIXTURE BALLASTS SHALL BE ELECTRICALLY CONNECTED TO THE PANEL WITH A GREEN CONDUCTOR. CONDUIT GROUND IS NOT ACCEPTABLE.
- E. APPROPRIATE GROUNDING LUGS SHALL BE PROVIDED ON ALL ENCLOSURES TO BE GROUNDED.
- F. PROVIDE U.L. LISTED / APPROVED GROUND CONNECTION LUG(S) AND FITTINGS. LUGS SHALL BE CULV. RATED. AREA OF LUG CONNECTION TO ENCLOSURE SHALL BE SCRAPED CLEAN OF ALL PAINT AND/OR FOREIGN MATERIALS AND LUG CONNECTED TO ENCLOSURE WITH U.L. APPROVED GROUNDING SCREW. (EXCEPTION: FACTORY PROVIDED GROUNDING LUG/LOCATION)

2.8 PANELBOARDS

- A. PANELBOARDS SHALL BE AS SPECIFIED ON THE DRAWINGS. MANUFACTURERS SHALL BE SCHNEIDER ELECTRIC (SQUARE D), SIEMENS, EATON, OR GE / ABB. PANELBOARDS SHALL HAVE FULLY-RATED COPPER BUSSES INSTALLED THE FULL LENGTH OF PANELBOARD, INCLUDING ANY AREAS INDICATED AS 'SPACE' ON THE PANELBOARD SCHEDULE.
- B. PANELBOARDS SHALL HAVE FULLY-RATED AIC RATINGS. AIC SERIES RATED PANELBOARDS ARE NOT ACCEPTABLE.
- C. PROVIDE THERMAL MAGNETIC TYPE CIRCUIT BREAKERS IN PANELBOARD. NUMBER AND AMPERAGE SIZE AS INDICATED ON PANEL SCHEDULES. ALL CIRCUIT BREAKERS SHALL BE 80% RATED UNLESS OTHERWISE INDICATED ON DRAWINGS.
- D. ALL SERVICE ENTRANCE EQUIPMENT SHALL BE S.E. RATED.

2.9 NAMEPLATES / IDENTIFICATION

- A. ALL PANELBOARDS, TRANSFORMERS, LIGHTING CONTACTORS, MOTOR STARTERS, DISCONNECTS, TIMERS, ETC. SHALL BE PROVIDED WITH NAMEPLATES WITH EQUIPMENT NAME AND VOLTAGE. LABELS ON EQUIPMENT SHALL BE LAMINATED PLASTIC, BLACK WITH WHITE ENGRAVING UNLESS OTHERWISE NOTED. LABELS SHALL BE SECURELY FASTENED TO EQUIPMENT BY USE OF RIVETS OR SCREWS.
- B. CONTRACTOR SHALL PROVIDE LABELS ON RECEPTACLE FACEPLATES TO DENOTE THE PANEL AND CIRCUIT SERVING EACH DEVICE. LABELS SHALL BE THE SELF-ADHESIVE TYPE AND BE WHITE WITH BLACK LETTERING. TEXT HEIGHT SHALL BE BETWEEN 3/8" AND 1/4" TO ENSURE LEGIBILITY AND TO PROPERLY FIT ON THE FACEPLATE AS REQUIRED.
- C. PANELBOARD DIRECTORY LABELING NOTE - CONTRACTOR SHALL ENSURE ALL PANELBOARD DIRECTORIES MODIFIED AS A PART OF WORK SHOWN ON THESE PLANS ARE UPDATED TO REFLECT AS-BUILT CONDITIONS AND INCLUDE EACH CIRCUIT'S CLEAR, EVIDENT, AND SPECIFIC PURPOSE OR USE IN ACCORDANCE WITH NEC ARTICLE 408.4(A).

2.10 TOUCH-UP FINISH

- A. WHEN GROUTING AROUND LIGHT SWITCHES, RECEPTACLES AND/OR TELEPHONE DEVICES, THE PLATES SHALL BE REMOVED SO NO GROUT MATERIAL IS ON PLATE. THE CONTRACTOR SHALL REPLACE ANY PLATE, WIRING DEVICE OR ANY PORTION OF THE ELECTRICAL EQUIPMENT THAT BECOMES COATED WITH FOREIGN MATERIAL WHEN NECESSARY CARE OF PREVENTION HAS BEEN DISREGARDED.
- B. ALL PANELBOARDS, JUNCTION BOXES, SWITCHES OR ASSOCIATED CONTROL EQUIPMENT SHALL BE CLEANED, INTERIOR AND EXTERIOR, OF ALL PAINT, MORTAR, AND/OR TRASH THAT ACCUMULATES DURING CONSTRUCTION AND AFTER CONSTRUCTION AND HAS BEEN COMPLETED.
- C. OPENINGS FOR CONDUITS THRU WALLS, FLOORS, ETC., AND THE GROUTING AROUND CONDUITS IN THE OPENINGS SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. NEW OR PATCHED WORK SHALL BE PAINTED TO MATCH SURROUNDING SURFACES, PRIOR TO ACCEPTANCE OF ELECTRICAL CONTRACTOR'S WORK

PART 3 - TESTING | INSTALLATION | COORDINATION

- A. AFTER THE INTERIOR WIRING SYSTEM IS COMPLETED, THE CONTRACTOR SHALL CONDUCT OPERATING TESTS FOR APPROVAL. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE OF THE AUTHORIZED REPRESENTATIVE OF THE BUILDING OWNER. THE INSTALLATION SHALL BE DEMONSTRATED TO OPERATE IN ACCORDANCE WITH THE REQUIREMENTS OF THIS SPECIFICATION. THE CONTRACTOR SHALL FURNISH ALL INSTRUMENTS AND PERSONNEL REQUIRED FOR THESE TESTS.
- B. ALL FEEDERS SHALL BE TESTED WITH A 1000 A VOLT MEGGAR AND FOUND TO BE WITHIN ACCEPTABLE LIMITS BEFORE PLACING IN SERVICE.
- C. ALL DUPLEX OUTLETS SHALL BE CHECKED FOR PROPER WIRING, INCLUDING GROUNDING, WITH RECEPTACLE POLARIZER.
- D. PROPER PHASE ROTATION OF ALL MOTORS SHALL BE VERIFIED WITH A PHASE ROTATION METER PRIOR TO MOTOR START-UP. ANY SWAPPING OF MOTOR LEADS TO OBTAIN PROPER PHASE ROTATION SHALL BE DONE AT MOTOR J.B. AND NOT AT DISCONNECT SWITCH.

EQUIPMENT NOTE

THE CONTRACTOR SHALL VERIFY ALL EQUIPMENT INFORMATION WITH ITS RESPECTIVE TRADE FOR VOLTAGE, PHASE, AND MOCP (MAXIMUM OVER-CURRENT PROTECTION) PRIOR TO ROUGH-IN. EDI HAS MADE ALL EFFORTS TO CORRECTLY IDENTIFY EACH PIECE OF EQUIPMENT LOAD IN ORDER TO REFLECT THE CORRECT CONDUIT, WIRE, AND CIRCUIT BREAKER SIZE WITH RESPECT TO VOLTAGE DROP AND EQUIPMENT LOAD, HOWEVER; IF ANY INFORMATION SHOWN ON THESE DRAWINGS CONTRADICTS WITH THE ACTUAL EQUIPMENT SUPPLIED THEN THE CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY FOR PROVIDING ADEQUATE CONDUIT, WIRE, AND MOCP SIZED FOR THESE PIECES OF EQUIPMENT INSTALLED IN ACCORDANCE WITH THE NEC.

SECURITY COORDINATION NOTE

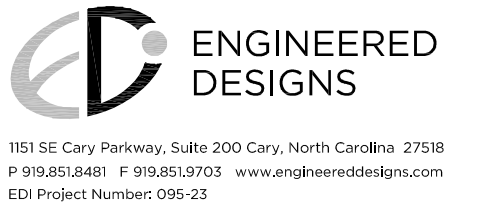
THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL POWER, CONDUIT AND/OR DATA REQUIREMENT NEEDS FOR SECURITY AND DOOR HARDWARE WITH SECURITY/DOOR HARDWARE VENDORS AND THE ARCHITECT PRIOR TO ROUGH-IN. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL ROUTING OF CONDUIT, WIRING AND TERMINATION POINTS WITH THE GENERAL CONTRACTOR, SECURITY/DOOR HARDWARE VENDORS AND THE ARCHITECT PRIOR TO ROUGH-IN. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL CONDUIT, PULL-STRINGS, JUNCTION BOXES, LOW-VOLTAGE TRANSFORMERS, RELAYS AND ALL OTHER COMPONENTS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM REGARDING THE SECURITY SYSTEM(S) AND DOOR HARDWARE INTERCONNECTIONS. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO COORDINATE ALL INFORMATION IN ORDER TO CORRECTLY PREP ALL OF THE REQUIRED DOORS INDICATED WITHIN THE PROJECT AREA.

- ALL WORK IS TO BE CONCEALED IN ALL APPLICATIONS. JUNCTION BOXES AND LOW VOLTAGE TRANSFORMERS REQUIRING ACCESS SHALL BE MOUNTED ABOVE DOOR FRAMES AND ABOVE ACCESSIBLE CEILINGS WHERE APPLICABLE TO CONCEAL SUCH WORK.

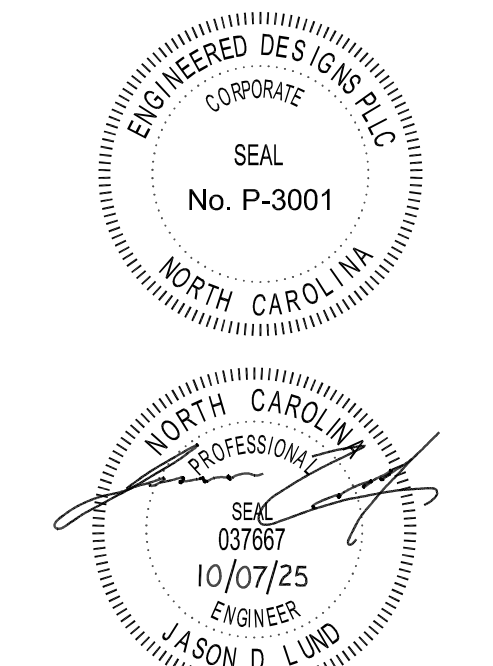


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EAST RALEIGH PARK AND RIDE
100% CONSTRUCTION DRAWINGS
1426 WILDERS GROVE LN. AND
1451 N. HOPE RD.
RALEIGH, NC



REVISIONS

NO. DATE

PLAN INFORMATION

PROJECT NO. RAL22005
FILENAME
CHECKED BY JDL
DRAWN BY CAM
SCALE AS NOTED
DATE 10.07.2025

TITLE

ELECTRICAL
SPECIFICATIONS AND
NOTES
E0.2

BUY AMERICA PROGRAM REQUIREMENTS

ALL PRODUCTS PROVIDED ON THIS PROJECT MUST BE MANUFACTURED IN COMPLIANCE WITH THE BUY AMERICA PROGRAM FOR FEDERALLY FUNDED TRANSPORTATION PROJECTS PER CODE OF FEDERAL REGULATIONS 49 CFR 661. THESE REQUIREMENTS ARE DISTINCT AND DIFFERENT FROM THOSE OF THE BUY AMERICAN ACT OF 1933.



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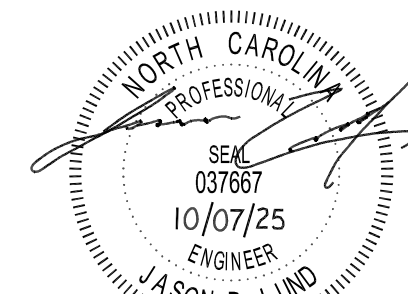
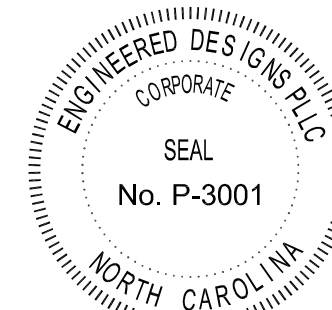
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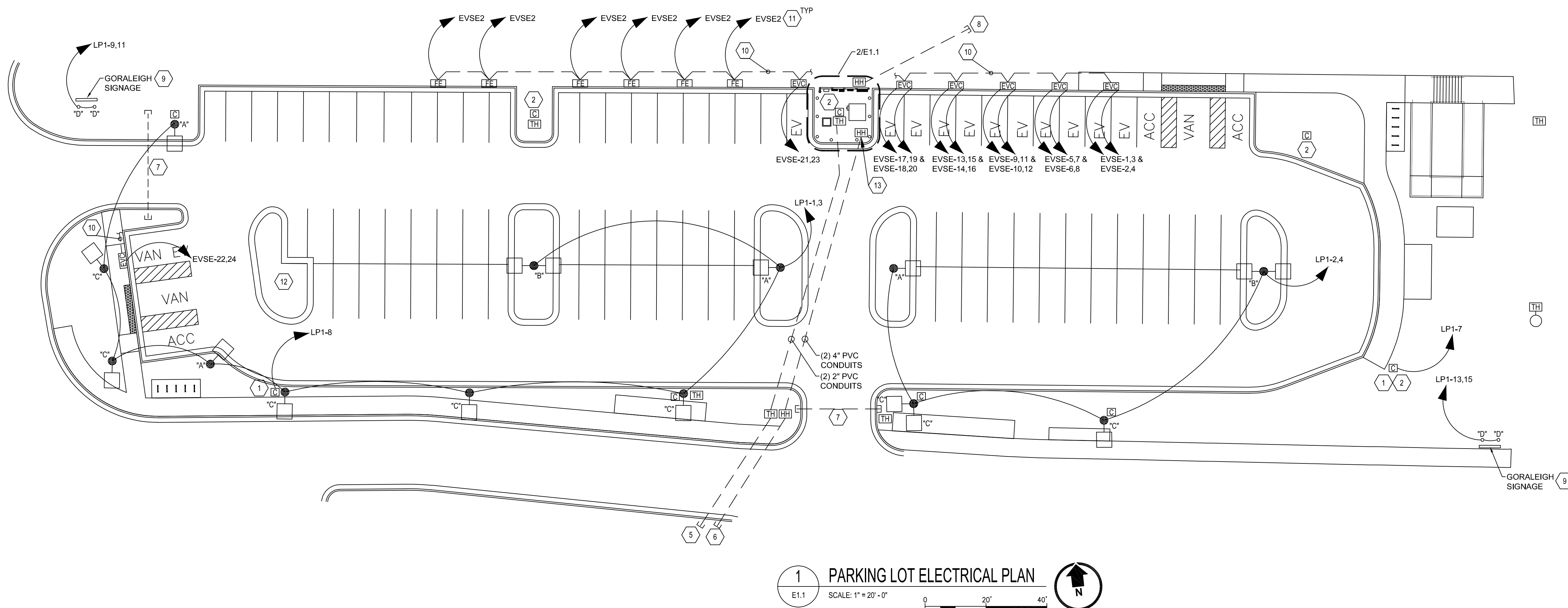
SCALE AS NOTED

DATE 10.07.2025

TITLE

PARKING LOT
ELECTRICAL PLAN

E1.1

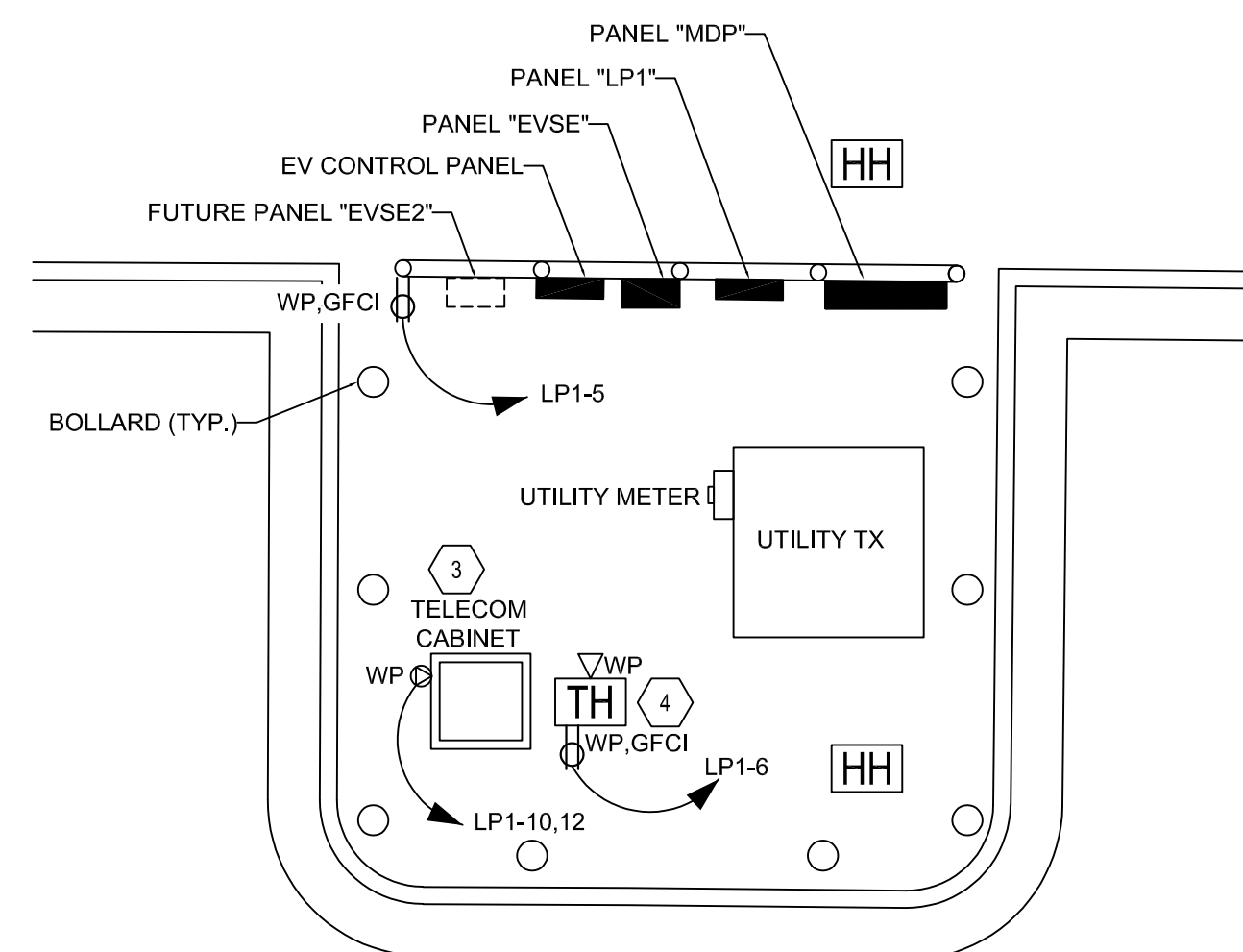


KEYED NOTES

- 1 NEMA 3R JUNCTION BOX SERVING CAMERA MOUNTED AT 8'. ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUITS INDICATED ON E1.2 WITH PULL STRING. PROVIDE JUNCTION BOX WITH 120V, 20A GFCI RECEPTACLE FOR VIDEO CONVERTER POWER.
- 2 POLE MOUNTED CAMERA AT 15' AFG. POLE SHALL BE 20' TALL, STRAIGHT ALUMINUM TUBE ALLOY (SATIN ALUMINUM FINISH) WITH ALUMINUM POLE CAP AND HANDHOLE. PROVIDE CAMERA POLES MODEL CPRS20 OR EQUAL.
- 3 TELECOM CABINET BASIS OF DESIGN IS THE "DDB OD-30DXC NEMA 3R TELECOM CABINET". PROVIDE A 208V SPECIAL PURPOSE RECEPTACLE CONNECTION WITH LOCKING IN USE COVER FOR TELECOM CABINET CONDITIONING UNIT AS INDICATED. CONDITIONING UNIT BASIS OF DESIGN IS THE "HOFFMAN T20-SERIES COMPACT OUTDOOR" MODEL NUMBER "T200226G158". CONTRACTOR SHALL PROVIDE CONCRETE EQUIPMENT PAD FOR TELECOM CABINET. PROVIDE 24" MOUNTING PEDESTAL COMPATIBLE WITH THE TELECOM CABINET TO ELEVATE INSTALLATION. BASIS OF DESIGN IS THE "DDB, CB SERIES - 24" PEDESTAL BASE". REFER TO DETAILS FOR MORE INFORMATION. ALL REQUIRED EQUIPMENT LOCATED INSIDE CABINET TO PROVIDE A COMPLETE AND OPERABLE SYSTEM SHALL BE FURNISHED AND INSTALLED BY OWNER AND OR VENDOR.
- 4 LOCATE HANDHOLE ADJACENT TO TELECOM CABINET WITH (1) 20A WEATHERPROOF GFCI RECEPTACLE AND (1) WEATHERPROOF DATA OUTLET LOCATED INSIDE. REFER TO PANEL SCHEDULE FOR PANEL "LP1" FOR CIRCUITING INFORMATION.
- 5 ELECTRICAL CONTRACTOR SHALL PROVIDE (2) 2" SCHEDULE 40 GRAY PVC RIGID CONDUITS WITH PULL STRINGS FOR FUTURE TELECOM CONNECTION TO TRANSIT STATION. CAP AND LABEL EACH END AND STUB UP DIRECTLY BEHIND CURB OF NEW TRANSIT STATION FACILITY AS INDICATED. CONTRACTOR SHALL PROVIDE TELECOM HANDHOLES AS INDICATED. COORDINATE CONDUIT INSTALLATION WITH CIVIL CONTRACTOR TO AVOID CONFLICT WITH STORM WATER DRAINAGE PIPING.
- 6 ELECTRICAL CONTRACTOR SHALL PROVIDE (2) 4" SCHEDULE 40 GRAY PVC RIGID CONDUITS WITH PULL STRINGS FOR FUTURE ELECTRICAL CONNECTION TO TRANSIT STATION. CAP AND LABEL EACH END AND STUB UP DIRECTLY BEHIND CURB OF NEW TRANSIT STATION FACILITY AS INDICATED. CONTRACTOR SHALL PROVIDE ELECTRICAL HANDHOLES AS INDICATED. COORDINATE CONDUIT INSTALLATION WITH CIVIL CONTRACTOR TO AVOID CONFLICT WITH STORM WATER DRAINAGE PIPING.
- 7 ELECTRICAL CONTRACTOR SHALL INSTALL 2" SCHEDULE 40 GRAY PVC RIGID CONDUIT AS INDICATED FOR FUTURE GATE INSTALLATIONS. PROVIDE PULL STRING FOR FUTURE CONDUCTOR INSTALLATION. CAP AND LABEL EACH END 1" ABOVE FINISH GRADE.
- 8 CONTRACTOR SHALL PROVIDE 2" SCHEDULE 40 GRAY PVC RIGID CONDUIT FROM ELECTRICAL HANDHOLE TO FUTURE BRT STATION LOCATION. COORDINATE FINAL STUB UP LOCATION WITH OWNER. PROVIDE PULL STRING, CAP BOTH ENDS AND LABEL.
- 9 GORALEIGH SIGNAGE. PROVIDE PHOTOCELL AT TOP OF SIGN TOWARDS THE REAR SO AS TO BE AS INCONSPICUOUS AS PRACTICAL WHILE STILL PROPERLY DETECTING DAYLIGHT. PHOTOCELL TO CONTROL ASSOCIATED TYPE "D" LIGHT FIXTURES FOR DUSK TILL DAWN OPERATION.
- 10 PROVIDE 1-1/4" PVC CONDUIT BETWEEN EACH EVC PEDASTAL LOCATION AND STUB UP NEXT TO UTILITY RACK FOR FUTURE CONTROL WIRING. PROVIDE PULL STRING, CAP AND LABEL BOTH ENDS.
- 11 PROVIDE 1-1/2" PVC CONDUIT FROM UTILITY RACK TO EACH FUTURE EVC PEDASTAL LOCATION AND STUB UP NEXT TO UTILITY RACK FOR FUTURE POWER CONNECTIONS. PROVIDE PULL STRING, CAP AND LABEL BOTH ENDS.
- 12 RAIN GARDEN ISLAND. CONTRACTOR SHALL ENSURE THAT NO CONDUIT IS RUN UNDERNEATH RAINGARDEN ISLAND.
- 13 ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE LOCAL POWER UTILITY FOR APPROVAL TO STUB UP SPARE POWER CONDUITS WITHIN THE TRANSFORMER BASE. IF APPROVAL IS NOT GRANTED, SPARE CONDUITS SHALL BE TERMINATED IN HANDHOLE LOCATED ADJACENT TO THE TRANSFORMER.

GENERAL NOTES

- A. ALL CONDUITS SHALL BE ENCASED IN CONCRETE DUCTBANK WHERE SUBJECT TO VEHICLE TRAFFIC. ALL DUCTBANK SHALL BE INSTALLED AT LEAST 48" BFG TO TOP OF DUCTBANK. COORDINATE WITH GENERAL NOTE E.
- B. ALL CONDUIT INSTALLED BELOW GRADE SHALL BE A MINIMUM OF 1-1/4" SCHEDULE 40 GRAY PVC RIGID CONDUIT WITH INTEGRAL BELL FITTING. ALL CONDUIT SHALL BE BURIED A MINIMUM OF 48" BFG TO TOP OF CONDUIT. COORDINATE WITH GENERAL NOTE E.
- C. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL CONDUITS REQUIRED FOR CONTROL WIRING AND POWER CONNECTIONS TO EV CHARGERS. REFER TO EV BINDER PROVIDED BY EV CONTRACTOR FOR MORE INFORMATION.
- D. ALL RECEPTACLES AND PANELBOARDS ACCESSIBLE TO THE GENERAL PUBLIC SHALL BE LOCKED. PROVIDE PAD LOCK FOR EACH PIECE OF EQUIPMENT. ALL LOCKABLE PANEL BOARD COVERS AND CABINETS INSTALLED SHALL BE KEYED ALIKE. COORDINATE KEYING REQUIREMENTS WITH OWNER.
- E. ALL CONDUIT INSTALLATIONS SHALL BE CLOSELY COORDINATED WITH PERMEABLE PAVEMENT. CONDUITS SHALL BE INSTALLED PRIOR TO PERMEABLE PAVEMENT LINER AND STONE INSTALLATION. COORDINATE ALL CONDUIT INSTALLATIONS WITH CIVIL CONTRACTOR PRIOR TO INSTALLATION.
- F. COORDINATE ALL HANDHOLE AND UTILITY BOX INSTALLATIONS WITH CIVIL CONTRACTOR PRIOR TO INSTALLATION.
- G. ALL CONDUITS INSTALLED BELOW GRADE SHALL BE INSTALLED WITH FABRIC INNERDUCT WITH INTEGRAL TRACER WIRE. FABRIC INNERDUCT SHALL BE MAXCELL EDGE DETECTABLE SIZED OR APPROVED EQUAL SIZED PER CONDUIT DIMENSIONS.



BUY AMERICA PROGRAM REQUIREMENTS

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McAdams

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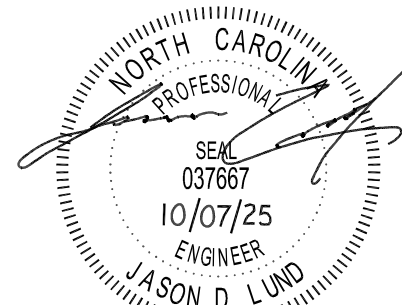
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EDI Project Number: 005-23

EAST RALEIGH PARK AND RIDE
100% CONSTRUCTION DRAWINGS
1426 WILDERS GROVE LN. AND
1451 N. HOPE RD.
RALEIGH, NC



REVISIONS

NO. DATE

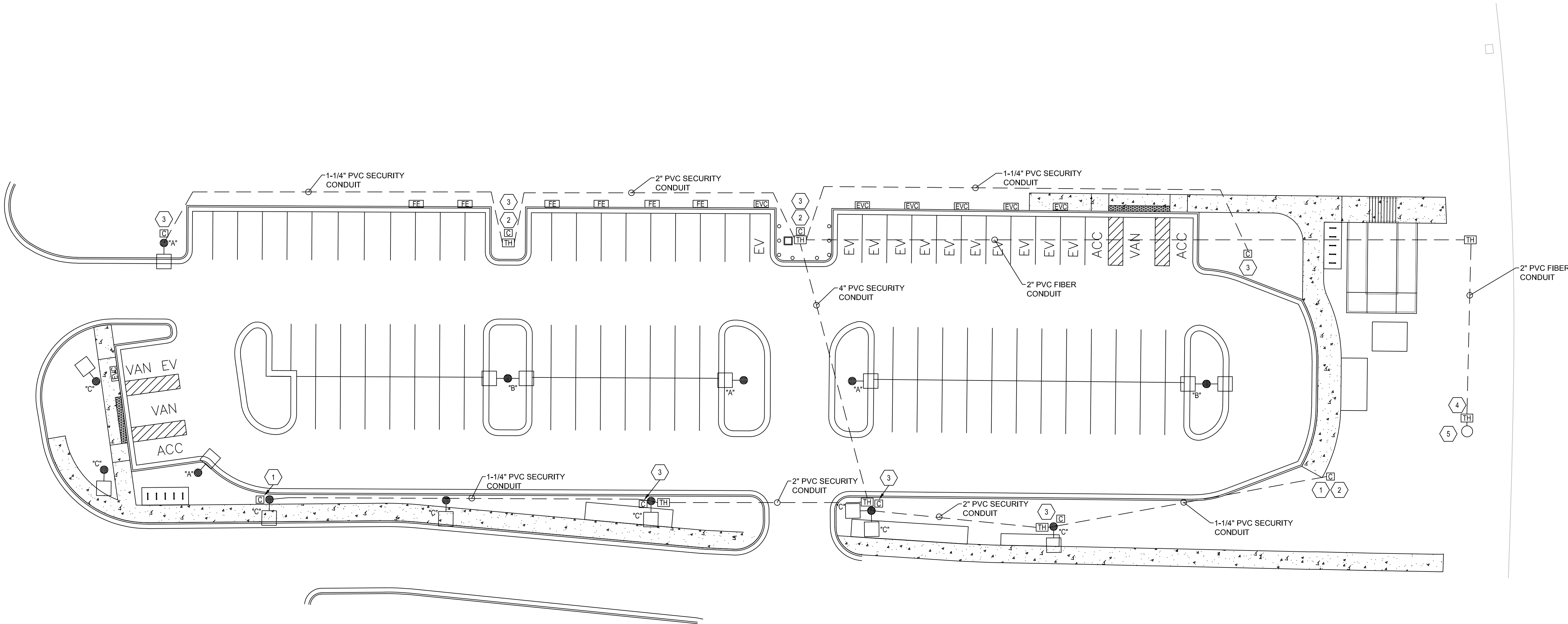
PLAN INFORMATION

PROJECT NO. RAL22005
FILENAME
CHECKED BY JDL
DRAWN BY CAM
SCALE AS NOTED
DATE 10.07.2025

TITLE

PARKING LOT SECURITY
PLAN

E1.2



1 PARKING LOT SECURITY PLAN
E1.2 SCALE: 1" = 20' - 0" 0 20' 40' N

GENERAL NOTES

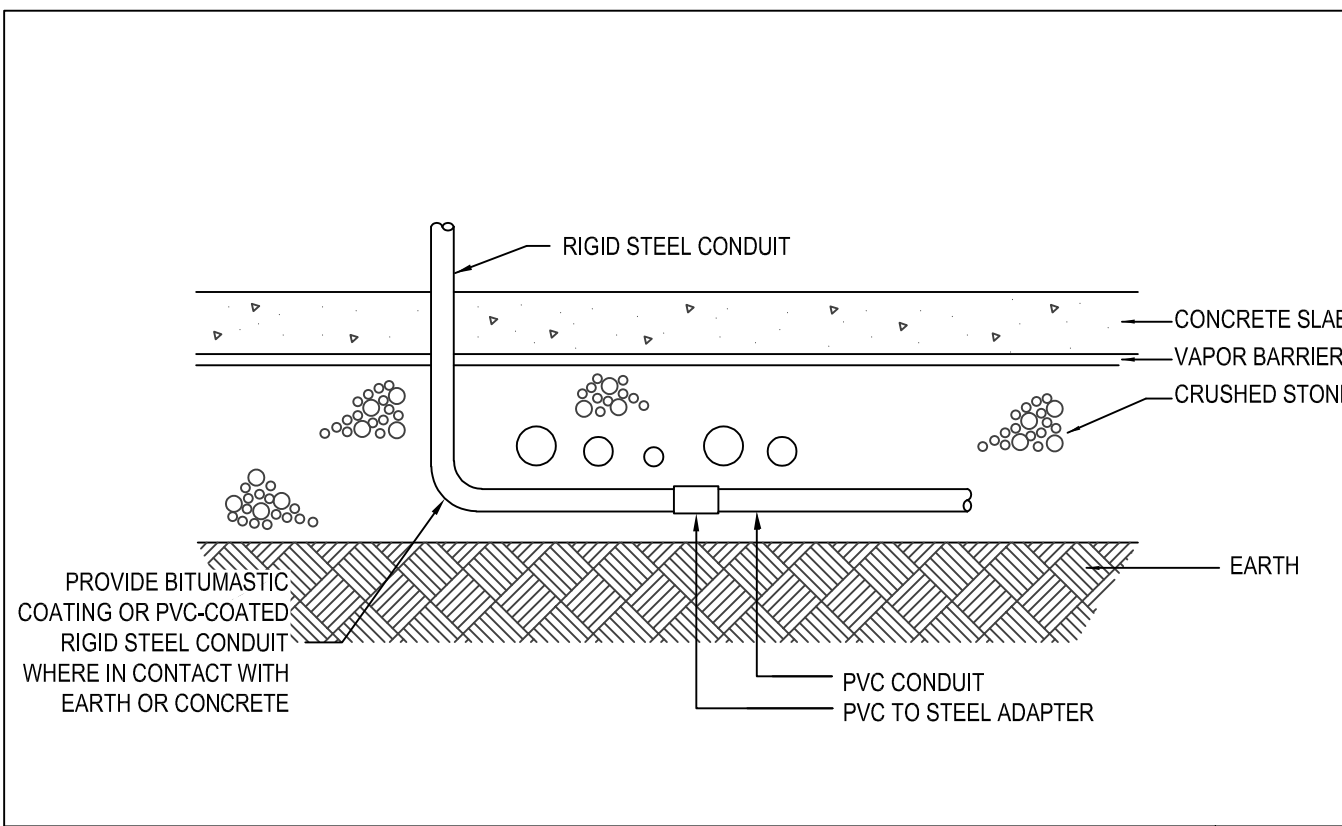
- ALL CONDUITS SHALL BE ENCASED IN CONCRETE DUCTBANK WHERE SUBJECT TO VEHICLE TRAFFIC. ALL DUCTBANK AND CONDUITS SHALL BE BURIED A MINIMUM OF 48" BFG TO TOP OF DUCTBANK/CONDUIT. COORDINATE WITH GENERAL NOTE C.
- ALL CONDUIT INSTALLED BELOW GRADE SHALL BE A MINIMUM OF 1-1/4" SCHEDULE 40 GRAY PVC RIGID CONDUIT WITH INTEGRAL BELL FITTING. ALL CONDUIT SHALL BE BURIED A MINIMUM OF 48" BFG TO TOP OF CONDUIT. COORDINATE WITH GENERAL NOTE C.
- ALL CONDUIT INSTALLATIONS SHALL BE CLOSELY COORDINATED WITH PERMEABLE PAVEMENT. CONDUITS SHALL BE INSTALLED PRIOR TO PERMEABLE PAVEMENT LINER AND STONE INSTALLATION. COORDINATE ALL CONDUIT INSTALLATIONS WITH CIVIL CONTRACTOR PRIOR TO INSTALLATION.
- COORDINATE ALL HANDHOLE AND UTILITY BOX INSTALLATIONS WITH CIVIL CONTRACTOR PRIOR TO INSTALLATION.

KEYED NOTES

- NEMA 3R JUNCTION BOX SERVING CAMERA MOUNTED AT 8' AFG. ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUITS SHOWN WITH PULL STRING. PROVIDE JUNCTION BOX WITH 120V, 20A GFCI RECEPTACLE FOR VIDEO CONVERTER POWER. REFER TO SHEET E1.1 FOR CIRCUITING.
- POLE MOUNTED CAMERA AT 15' AFG. POLE SHALL BE 20' TALL, STRAIGHT ALUMINUM TUBE ALLOY (SATIN ALUMINUM FINISH) WITH ALUMINUM POLE CAP AND HANDHOLE. PROVIDE CAMERA POLES MODEL CPRS420 OR EQUAL.
- CAMERA POWERED VIA POWER OVER ETHERNET (PoE). ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUITS SHOWN WITH PULL STRING.
- ELECTRICAL CONTRACTOR SHALL PROVIDE 2" SCHEDULE 40 GRAY PVC RIGID CONDUIT WITH PULL STRING FOR CONNECTION TO TELECOM CABINET. ELECTRICAL CONTRACTOR SHALL PROVIDE TELECOM HANDHOLES WHERE INDICATED.
- APPROXIMATE LOCATION OF EXISTING POWER POLE WITH FIBER FEED. EXTEND CONDUIT TO RISER ON EXISTING POLE. ELECTRICAL CONTRACTOR SHALL COORDINATE RISER AND WEATHERHEAD INSTALLATION WITH UTILITY COMPANY PRIOR TO INSTALLATION.

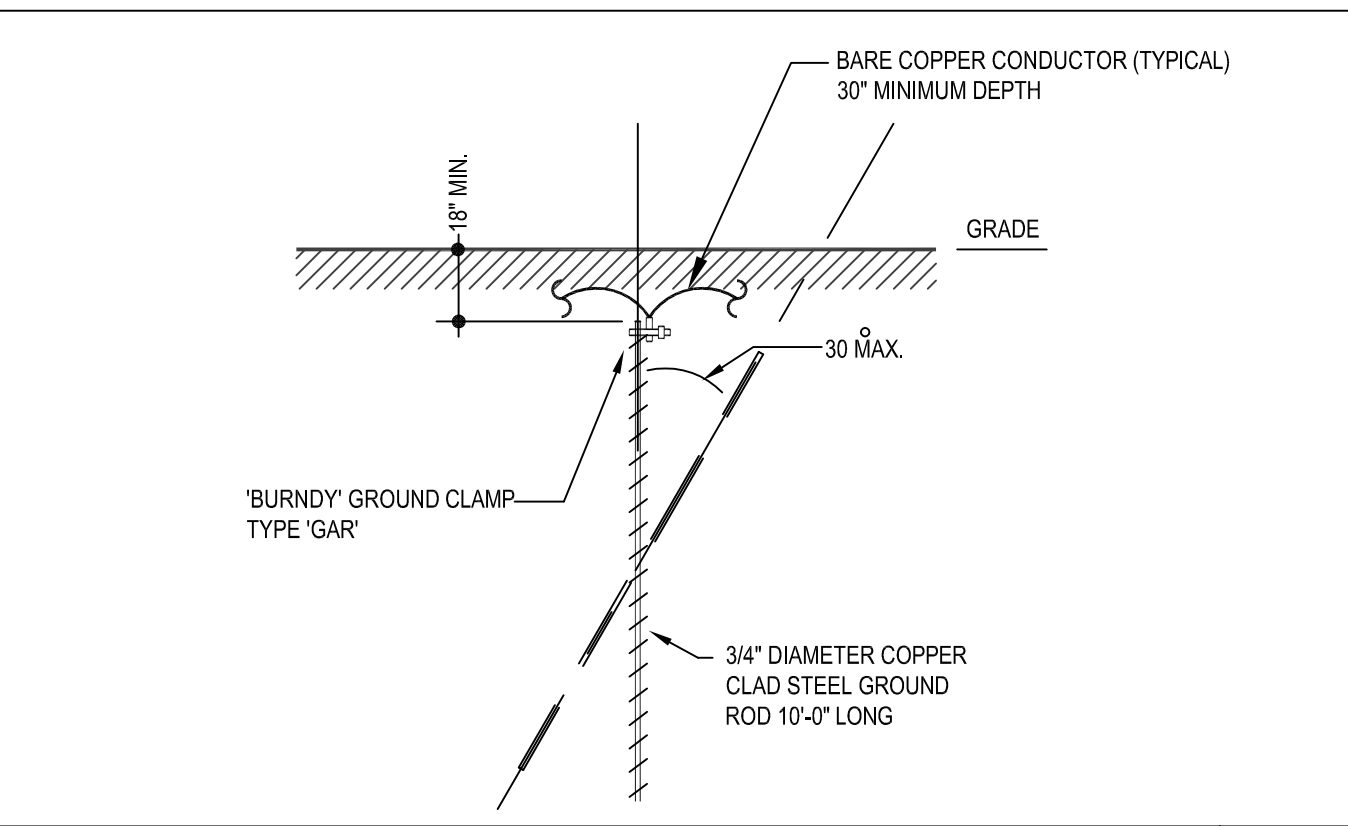
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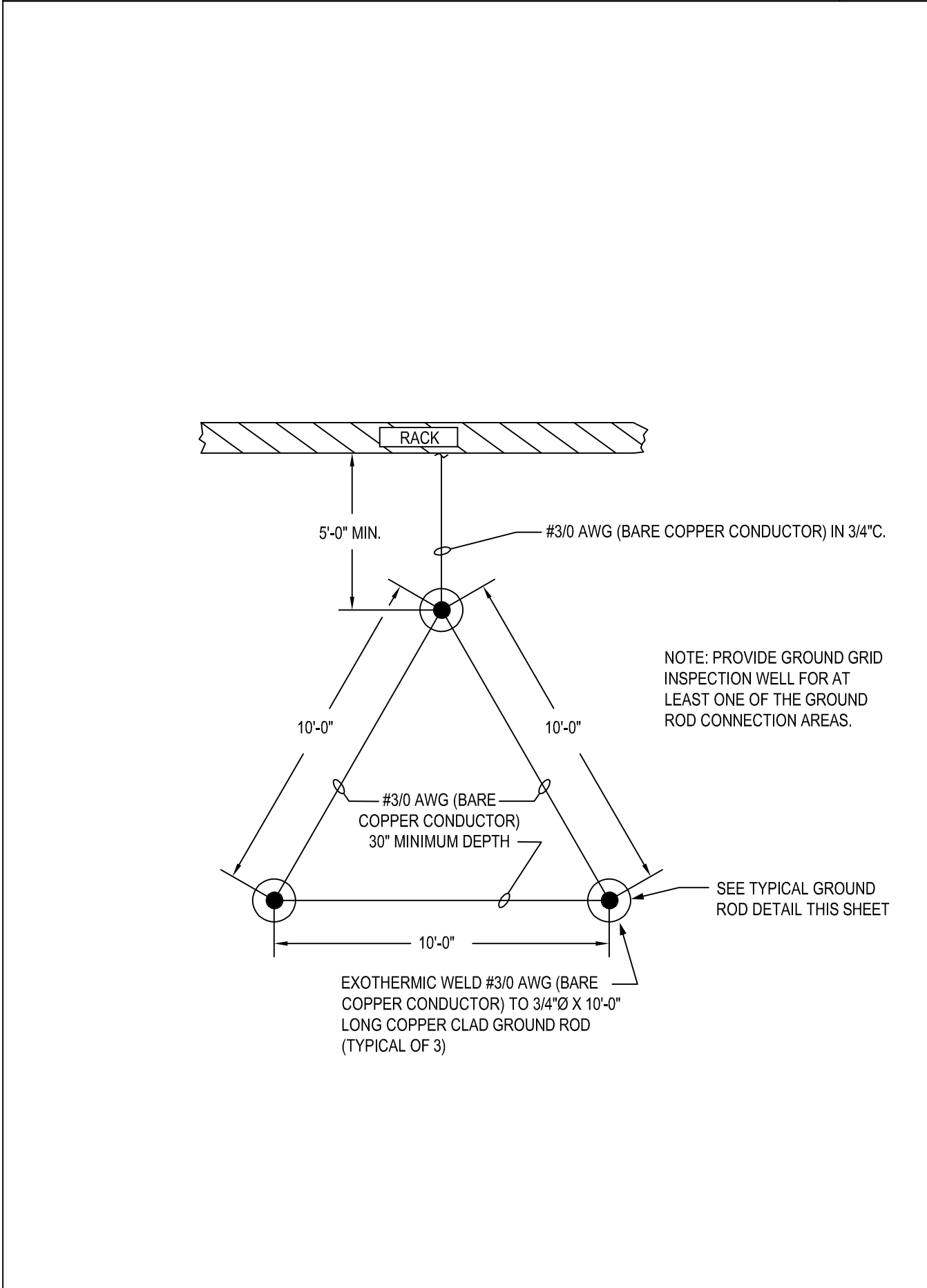
UNDER FLOOR CONDUIT AND CONVERSION FROM PVC TO STEEL CONDUIT

C004
N.T.S.



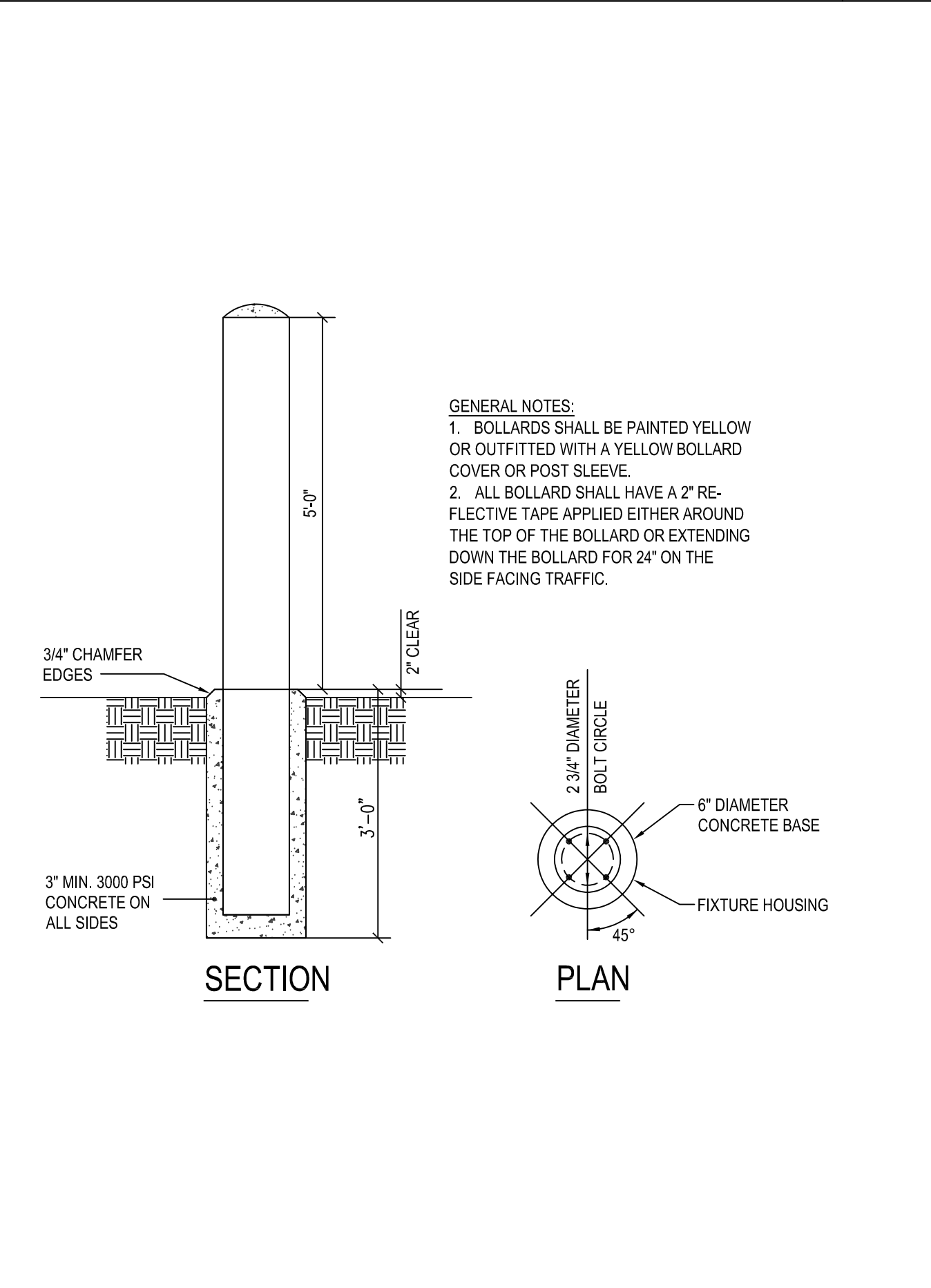
TYPICAL GROUND ROD DETAIL

G016
N.T.S.



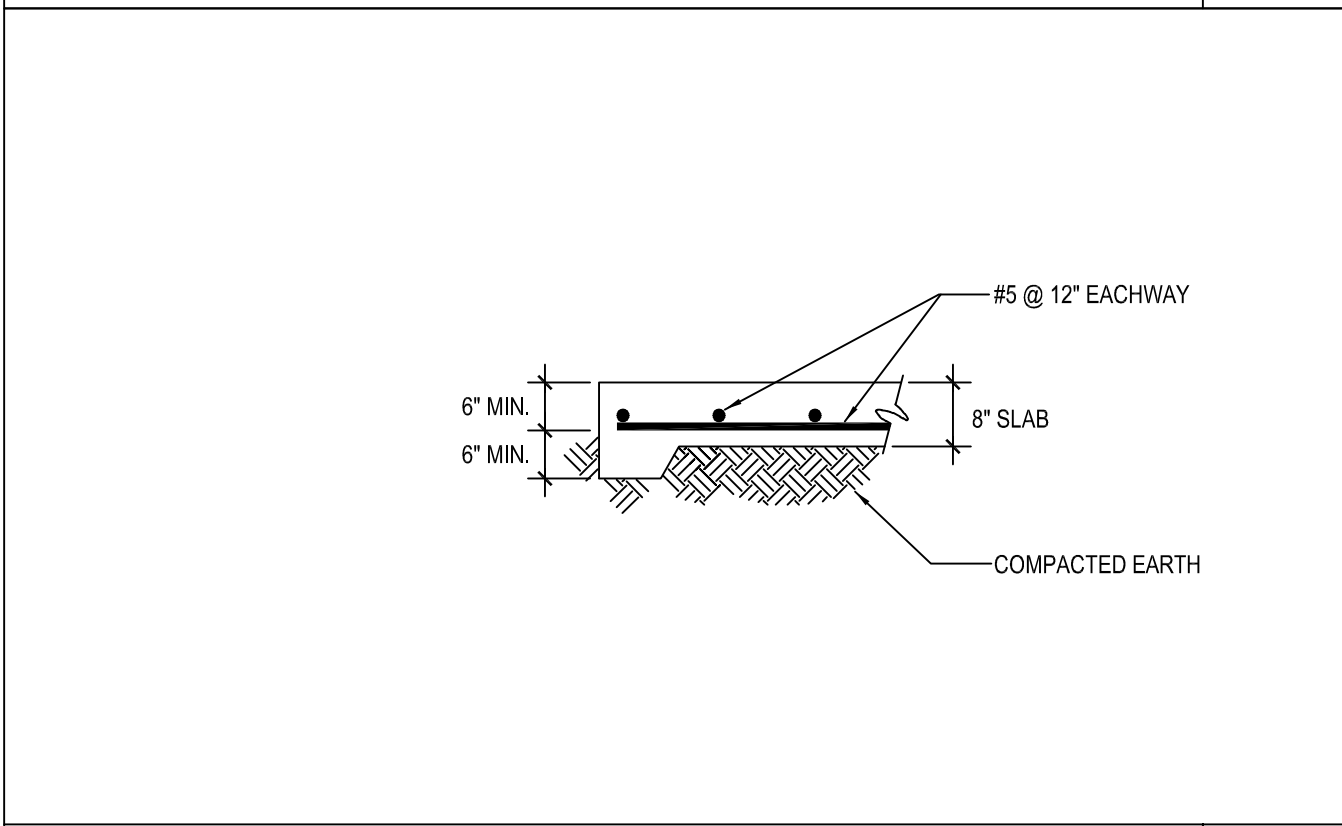
GROUND GRID DETAIL

G015
N.T.S.



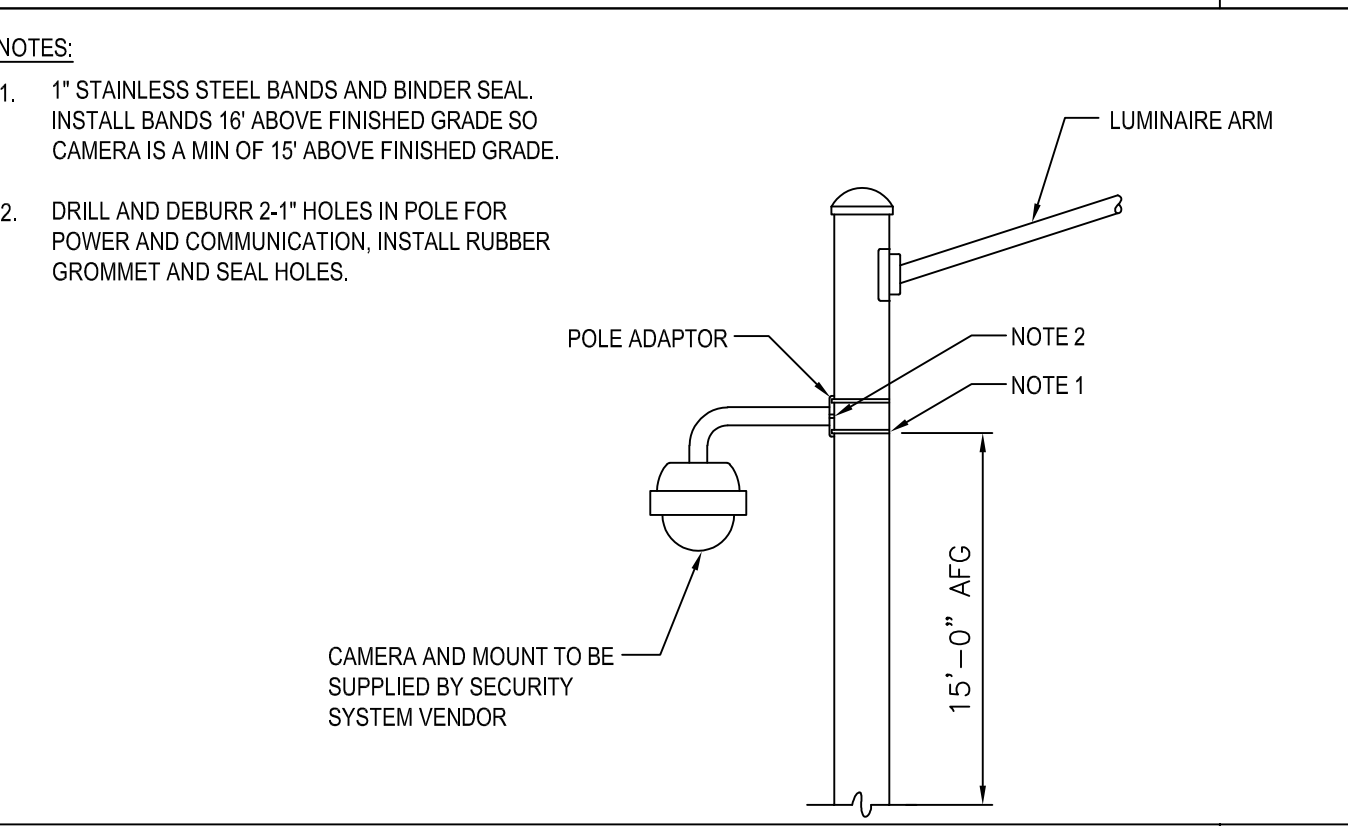
PROTECTIVE BOLLARD DETAIL

L060
N.T.S.



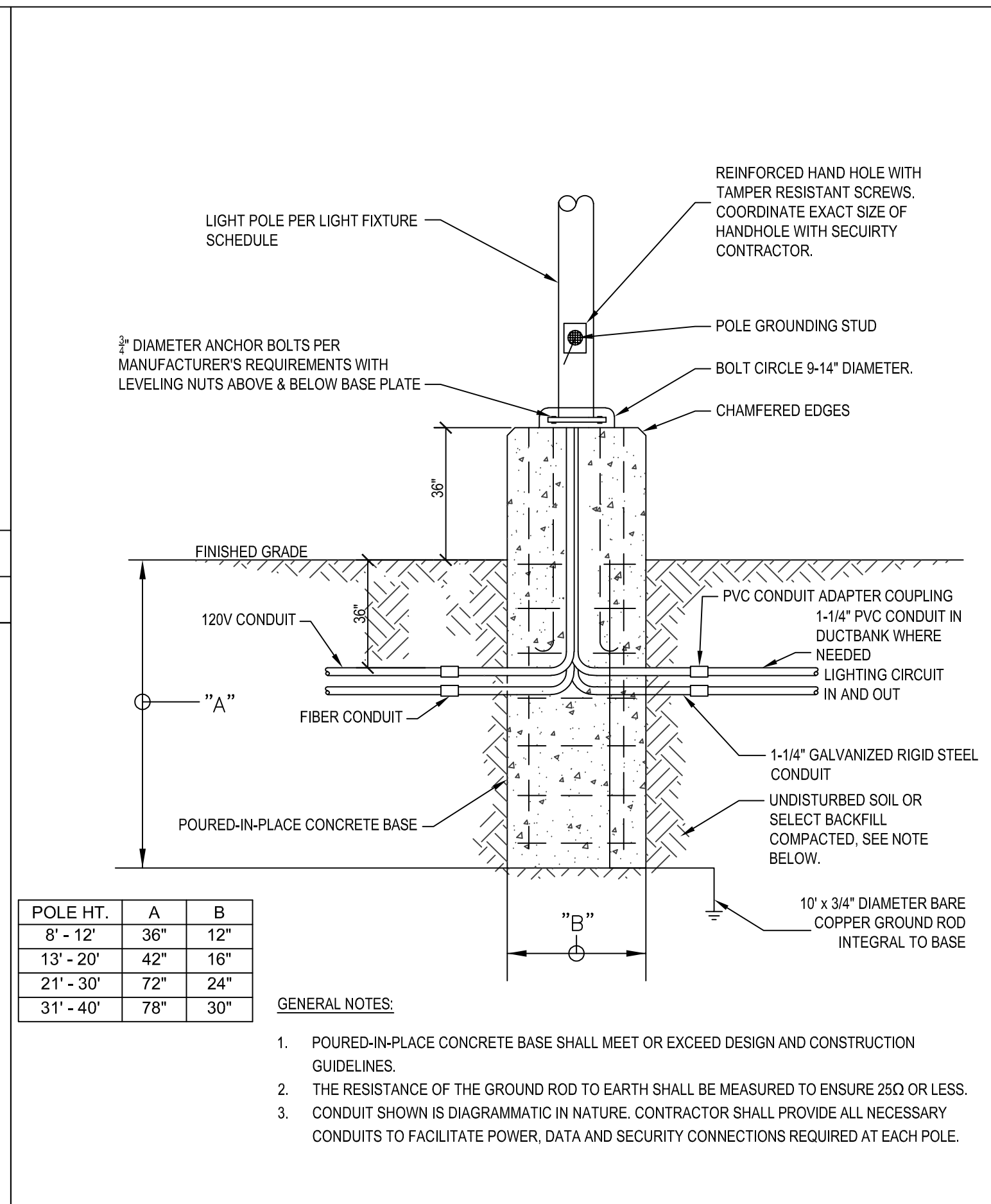
EQUIPMENT PAD (TYPICAL)

P011
N.T.S.



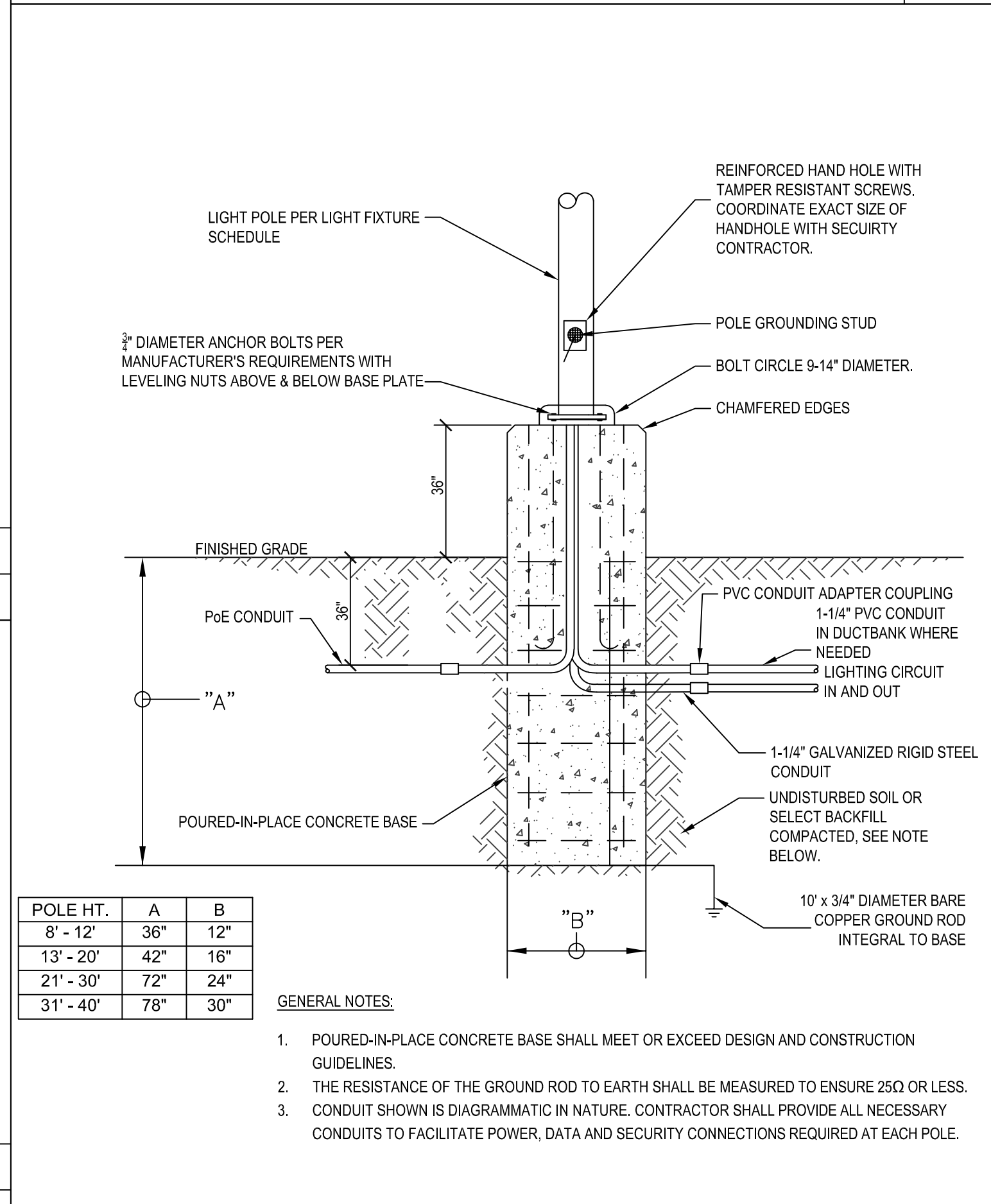
POLE MOUNTED CAMERA DETAIL

S012
N.T.S.



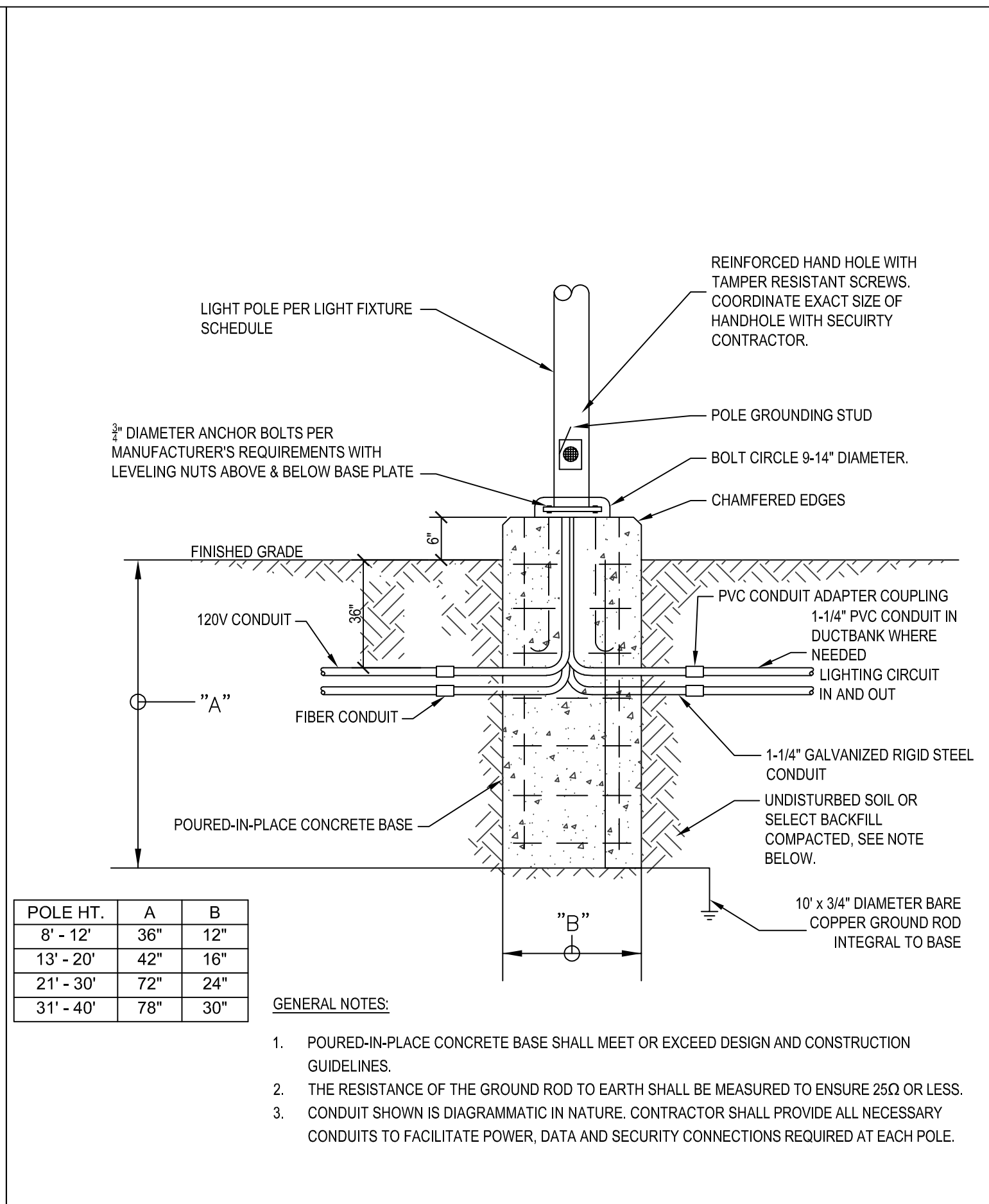
SITE LIGHT POLE BASE DETAIL FIBER CONNECTIONS

L061
N.T.S.



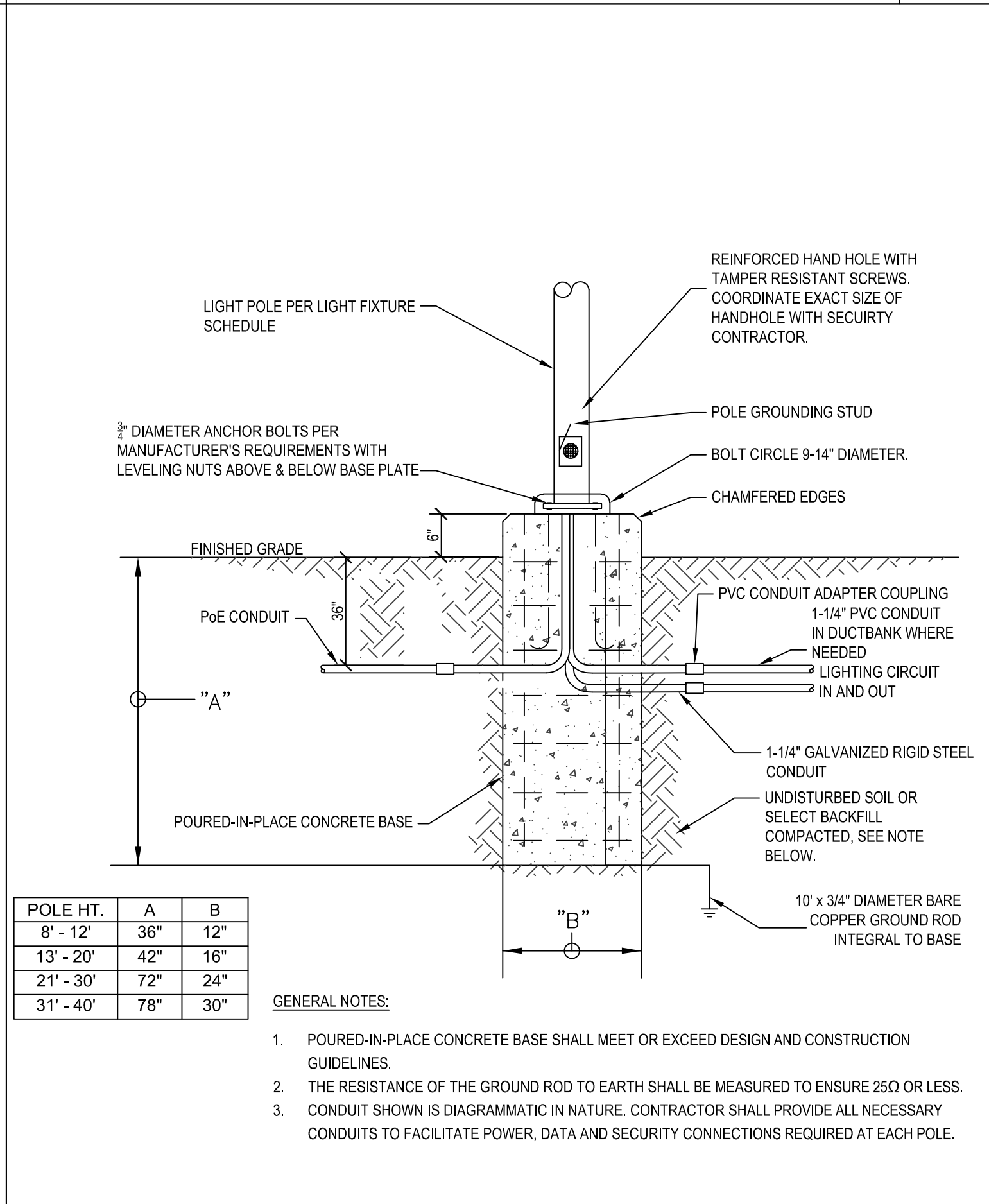
SITE LIGHT POLE BASE DETAIL WITH PoE CONNECTIONS

L061
N.T.S.



SITE LIGHT POLE BASE DETAIL FIBER CONNECTIONS - TURF AREAS

L061
N.T.S.



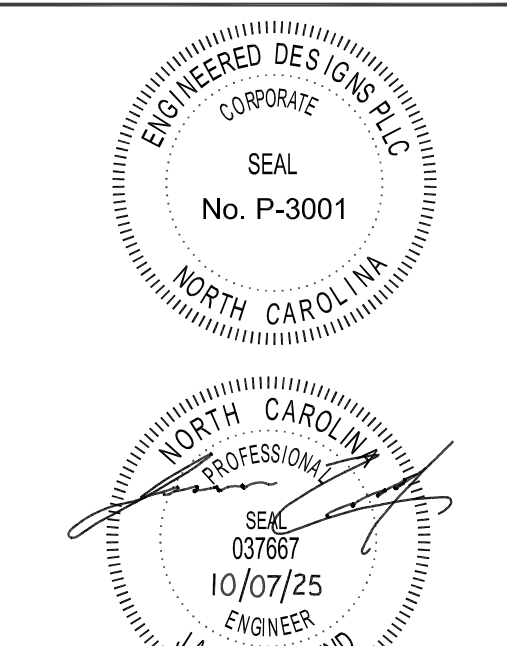
SITE LIGHT POLE BASE DETAIL WITH PoE CONNECTIONS - TURF AREAS

L061
N.T.S.

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RALEIGH, NC



REVISIONS

NO. DATE

PLAN INFORMATION

PROJECT NO. RAL22005
FILENAME
CHECKED BY JDL
DRAWN BY CAM
SCALE AS NOTED
DATE 10.07.2025

TITLE

ELECTRICAL DIAGRAMS
AND SCHEDULES

E4.1

ARC-FLASH HAZARD WARNING NOTE

PROVIDE ARC-FLASH WARNING LABELS AS OUTLINED IN NEC 110.21(B)
ON ELECTRICAL EQUIPMENT REQUIRED BY NEC 110.16(A)

FAULT CURRENT NAMEPLATE NOTE

PER NEC 110.24 THE CONTRACTOR SHALL PROVIDE A PHENOLIC NAME
PLATE WITH RED BACKGROUND AND 1/2 INCH HIGH WHITE LETTERS RIVETED
TO THE FACE OF ALL NEW ELECTRICAL EQUIPMENT TO READ:

"MAXIMUM AVAILABLE FAULT CURRENT XX.XXX AIC
CALCULATED XX-XXX-20XX"

INTERRUPTING RATING NOTE

ALL DOWNSTREAM PANELBOARDS AND CIRCUIT BREAKERS SHALL BE PROVIDED
WITH AN INTERRUPTING RATING (AIC) EQUAL TO OR GREATER THAN THE AVAILABLE
FAULT CURRENT AT THEIR LINE TERMINALS. COMPLIANCE SHALL BE IN
ACCORDANCE WITH NEC ARTICLE 110.9 AND NEC ARTICLE 110.10.

LOW-VOLTAGE FEEDER SCHEDULE

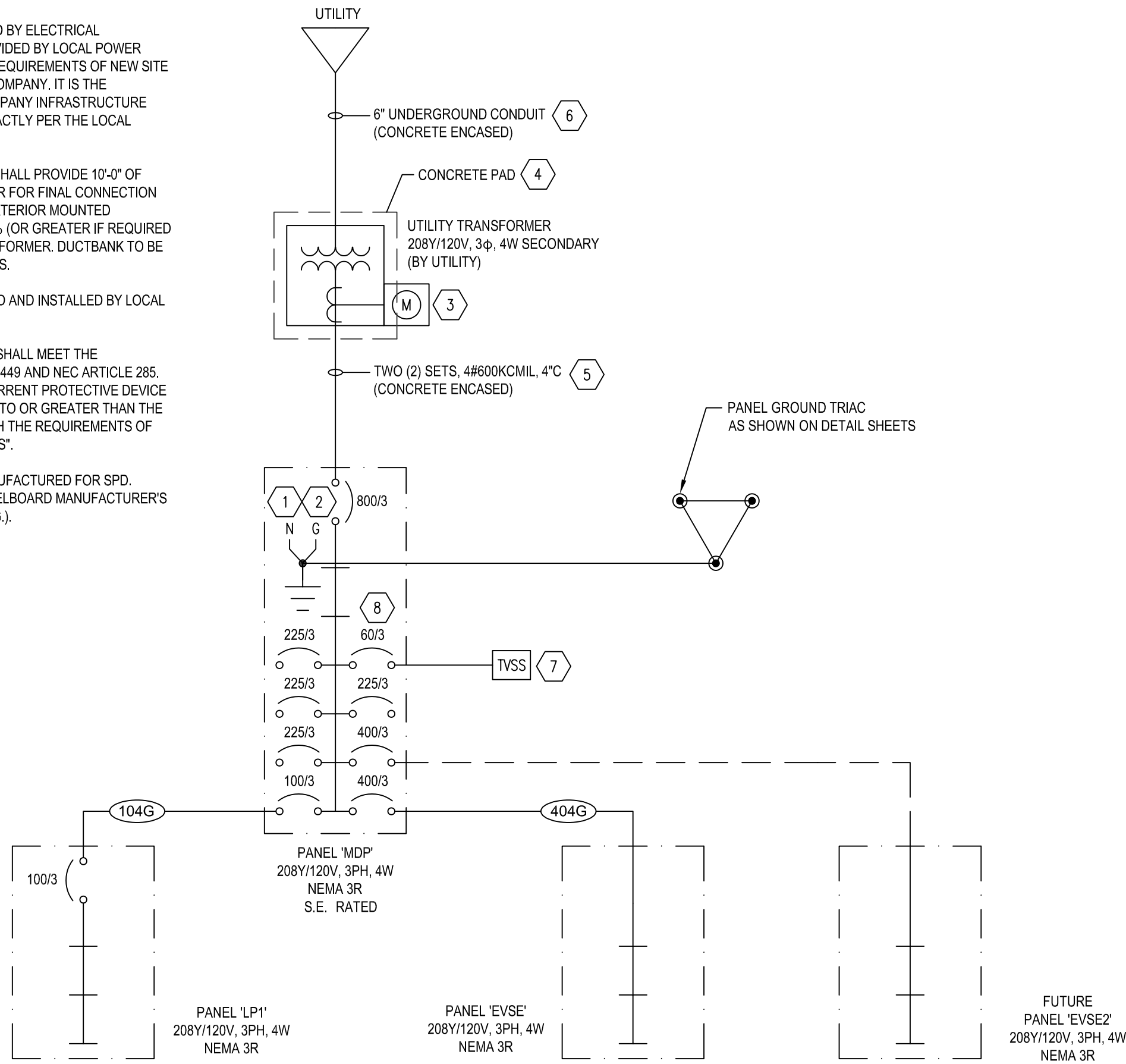
NOMINAL OCPD RATING	3-PHASE, 3-WIRE CIRCUITS					3-PHASE, 4-WIRE CIRCUITS					
	SYMBOL	SETS	PHASE CONDUCTORS	CONDUIT	EQUIPMENT GROUNDING CONDUCTOR	SYMBOL	SETS	PHASE CONDUCTORS	NEUTRAL CONDUCTOR	CONDUIT	EQUIPMENT GROUNDING CONDUCTOR
15 / 20	023G	--	3-#12	3/4"	1-#12G	024G	--	3-#12	1-#12	3/4"	1-#12G
25 / 30	033G	--	3-#10	3/4"	1-#10G	034G	--	3-#10	1-#10	3/4"	1-#10G
35 / 40	043G	--	3-#8	3/4"	1-#10G	044G	--	3-#8	1-#8	3/4"	1-#10G
45 / 50	053G	--	3-#8	1"	1-#10G	054G	--	3-#8	1-#8	1"	1-#10G
60	063G	--	3-#6	1"	1-#10G	064G	--	3-#6	1-#6	1"	1-#10G
70	073G	--	3-#4	1-1/4"	1-#8G	074G	--	3-#4	1-#4	1-1/4"	1-#8G
80	083G	--	3-#4	1-1/4"	1-#8G	084G	--	3-#4	1-#4	1-1/4"	1-#8G
90	093G	--	3-#3	1-1/4"	1-#8G	094G	--	3-#3	1-#3	1-1/4"	1-#8G
100	103G	--	3-#3	1-1/4"	1-#8G	104G	--	3-#3	1-#3	1-1/4"	1-#8G
125	123G	--	3-#1	1-1/2"	1-#6G	124G	--	3-#1	1-#1	1-1/2"	1-#6G
150	153G	--	3-#1/0	2"	1-#6G	154G	--	3-#1/0	1-#1/0	2"	1-#6G
175	173G	--	3-#2/0	2"	1-#6G	174G	--	3-#2/0	1-#2/0	2"	1-#6G
200	203G	--	3-#3/0	2"	1-#6G	204G	--	3-#3/0	1-#3/0	2"	1-#6G
225	223G	--	3-#4/0	2-1/2"	1-#4G	224G	--	3-#4/0	1-#4/0	2-1/2"	1-#4G
250	253G	--	3-#250KCMIL	2-1/2"	1-#4G	254G	--	3-#250KCMIL	1-#250KCMIL	2-1/2"	1-#4G
300	303G	--	3-#350KCMIL	3"	1-#4G	304G	--	3-#350KCMIL	1-#350KCMIL	3"	1-#4G
350	353G	--	3-#500KCMIL	3"	1-#3G	354G	--	3-#500KCMIL	1-#500KCMIL	3"	1-#3G
400	403G	2	3-#3/0	2"	1-#3G	404G	2	3-#3/0	1-#3/0	2"	1-#3G
450	453G	2	3-#4/0	2-1/2"	1-#2G	454G	2	3-#4/0	1-#4/0	2-1/2"	1-#2G
500	503G	2	3-#250KCMIL	2-1/2"	1-#2G	504G	2	3-#250KCMIL	1-#250KCMIL	2-1/2"	1-#2G
600	603G	2	3-#350KCMIL	3"	1-#1G	604G	2	3-#350KCMIL	1-#350KCMIL	3"	1-#1G
700	703G	2	3-#500KCMIL	3"	1-#1/0G	704G	2	3-#500KCMIL	1-#500KCMIL	3"	1-#1/0G
800	803G	3	3-#300KCMIL	3"	1-#1/0G	804G	3	3-#300KCMIL	1-#300KCMIL	3"	1-#1/0G
1000	1003G	3	3-#400KCMIL	3"	1-#2/0G	1004G	3	3-#400KCMIL	1-#400KCMIL	3"	1-#2/0G
1200	1203G	4	3-#350KCMIL	3"	1-#3/0G	1204G	4	3-#350KCMIL	1-#350KCMIL	3"	1-#3/0G
1600	1603G	5	3-#400KCMIL	3"	1-#4/0G	1604G	5	3-#400KCMIL	1-#400KCMIL	3"	1-#4/0G
2000	2003G	6	3-#400KCMIL	3"	1-#250KCMILG	2004G	6	3-#400KCMIL	1-#400KCMIL	3"	1-#250KCMILG
2500	2503G	6	3-#600KCMIL	4"	1-#350KCMILG	2504G	6	3-#600KCMIL	1-#600KCMIL	4"	1-#350KCMILG
3000	3003G	8	3-#500KCMIL	3"	1-#400KCMILG	3004G	8	3-#500KCMIL	1-#500KCMIL	3"	1-#400KCMILG

SCHEDULE NOTES:

- CONDUCTOR SIZES FOR THE ASSOCIATED NOMINAL AMPERE RATING ARE THE MINIMUM REQUIRED BASED UPON NEC TABLE 310.16 WITH NO GREATER THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IN AN AMBIENT NOT TO EXCEED 30 DEGREES C. FEEDER TAGS MAY BE OVERSIZED FOR THE ASSOCIATED OVERCURRENT PROTECTION T ACCOUNT FOR DERATING FACTORS OR LIMIT VOLTAGE DROP. FEEDER SIZES SHOWN ARE BASED ON 75°C, THHN / THWN-2 COPPER CONDUCTORS.
- RACEWAY SIZES INDICATED ARE THE MINIMUM REQUIRED BASED UPON NEC TABLE C1 FOR THHN / THWN-2 CONDUCTORS IN EMT. RACEWAY SIZES SHALL BE INCREASED TO ACCOMMODATE DIFFERING INSULATION SYSTEMS AND RACEWAY TYPES TO LIMIT RACEWAY FILL TO LESS THAN 40%.
- FEEDERS DESIGNATED IN MULTIPLE SETS SHALL HAVE THE REQUIRED SETS INSTALLED IN PARALLEL.

NOTES KEYED TO SINGLE LINE

- CONNECT TO NEW GROUNDING GRID PER DETAILS ON DETAILS SHEET.
- BOND NEUTRAL TO GROUND IN SERVICE PANEL 'MDP'.
- ELECTRICAL SERVICE METER TO BE MOUNTED ON SITE TRANSFORMER AND INSTALLED BY LOCAL POWER COMPANY.
- NEW SITE ELECTRICAL TRANSFORMER PAD INSTALLATION PROVIDED BY ELECTRICAL CONTRACTOR. SITE TRANSFORMER AND FINAL TERMINATIONS PROVIDED BY LOCAL POWER COMPANY. VERIFY EXACT MATERIALS NEEDED AND INSTALLATION REQUIREMENTS OF NEW SITE ELECTRICAL TRANSFORMER CONCRETE PAD WITH LOCAL POWER COMPANY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL ALL POWER COMPANY INFRASTRUCTURE REQUIRED FOR THIS NEW ELECTRICAL SITE TRANSFORMER PAD EXACTLY PER THE LOCAL POWER COMPANY'S STANDARDS.
- NEW ELECTRICAL SERVICE DUCTBANK. ELECTRICAL CONTRACTOR SHALL PROVIDE 10'-0" OF ADDITIONAL CONDUCTORS (SLACK) WITHIN NEW SITE TRANSFORMER FOR FINAL CONNECTION BY LOCAL POWER. THE UNDERGROUND CONDUIT FROM THE NEW EXTERIOR MOUNTED ELECTRICAL SERVICE PANEL SHALL BE SLOPED AT A MINIMUM OF 2% (OR GREATER IF REQUIRED BY LOCAL POWER COMPANY) BACK TOWARDS THE NEW SITE TRANSFORMER. DUCTBANK TO BE CONCRETE ENCASED AS REQUIRED BY SPECIFICATIONS AND DETAILS.
- PRIMARY DUCTBANK BY CONTRACTOR AND CONDUCTORS PROVIDED AND INSTALLED BY LOCAL POWER COMPANY.
- PROVIDE EXTERNAL MOUNTED SURGE SUPPRESSION DEVICE THAT SHALL MEET THE FOLLOWING STANDARDS: IEEE C62.41 & IEEE C62.45, NEMA LS 1, UL 1449 AND NEC ARTICLE 285. THE TVSS SHALL BE INSTALLED ON THE LOAD SIDE OF THE OVERCURRENT PROTECTIVE DEVICE AND SHALL BE A CATEGORY #2 TYPE DEVICE WITH A RATING EQUAL TO OR GREATER THAN THE AIC RATING INDICATED FOR THE NEW SERVICE PANEL. COMPLY WITH THE REQUIREMENTS OF NEC ARTICLE 285 "SURGE-PROTECTION DEVICES" (SPDs), 1kV OR LESS".
- PROVIDE CIRCUIT BREAKER SIZE AS RECOMMENDED BY PANEL MANUFACTURED FOR SPD. CIRCUIT BREAKER SHALL BE INSTALLED IN ACCORDANCE WITH PANELBOARD MANUFACTURER'S REQUIREMENTS. SIZE ALL CONDUITS TO SPD THE SAME (I.E. 5#6 AWG.).



1 SINGLE LINE DIAGRAM
E401 SCALE: NTS

LIGHT FIXTURE SCHEDULE

FIXTURE TYPE	DESCRIPTION	MOUNTING	VOLTS/WATTS	LAMPS		MANUFACTURER	SERIES NO.	REMARKS
				TYPE	LUMENS			
A	POLE-MOUNTED LED PARKING LOT FIXTURE	25' POLE	208/129	LED	16,071	COOPER/GALLEON BEACON ALS	BAA-GAN-SA4C-740-U-T4W-BK-P (70CRI, 4000K, 1000mA) VIPER AL4	MOUNT FIXTURE TO 25' LITHONIA SSA256J-BAA POLE OR APPROVED EQUAL BY BEACON OR ALS. FIXTURE TO BE EQUIPPED WITH INTEGRAL PHOTOCELL FOR DUSK UNTIL DAWN OPERATION.
B	DUAL HEAD POLE-MOUNTED LED PARKING LOT FIXTURES BACK TO BACK ON SAME POLE.	25' POLE	208/258	LED	(2) @ 16,071	COOPER/GALLEON BEACON ALS	BAA-GAN-SA4C-740-U-T4W-BK-P (70CRI, 4000K, 1000mA) VIPER AL4	MOUNT FIXTURE TO 25' LITHONIA SSA256J-BAA POLE OR APPROVED EQUAL BY BEACON OR ALS. FIXTURE TO BE EQUIPPED WITH INTEGRAL PHOTOCELL FOR DUSK TO DAWN OPERATION.
C	POLE-MOUNTED LED PEDESTRIAN WALKWAY FIXTURE	17' POLE	208/65	LED	6,000	COOPER SOLERA HCl	BAA-CCP-VA4-SA1-E-740-U-T4W-BK SOX F340-LED	MOUNT FIXTURE TO 17' LITHONIA SSA176J-BAA POLE OR APPROVED EQUAL BY BEACON OR ALS. FIXTURE TO BE EQUIPPED WITH INTEGRAL PHOTOCELL FOR DUSK TO DAWN OPERATION.
D	GROUND MOUNTED LED SIGN LIGHT	IN GROUND	208/12	LED	1630	COOPER BEACON WAC	LUMARK: TCRL15M-BK RFL3 ACCENT	GROUND MOUNTED FIXTURE TO ILLUMINATE SIGNAGE. FIXTURE TO BE PHOTOCELL CONTROLLED FOR DUSK TO DAWN OPERATION. FIXTURE SHALL BE WEATHERPROOF

LIGHTING NOTES:

- ALL LIGHTING FIXTURES SHALL BE U.L. LISTED.
- ALL LED FIXTURES SHALL HAVE MINIMUM CRI OF 80 UNLESS SPECIFICALLY NOTED OTHERWISE.
- LUMEN OUTPUT NOTED FOR LED FIXTURES IS THE MINIMUM THAT MUST BE PROVIDED FOR THE FIXTURE SPECIFIED.
- VERIFY ALL MOUNTING HEIGHTS WITH ARCHITECT PRIOR TO ROUGH-IN.
- COORDINATE ALL COLORS/FINISH OPTIONS OF LIGHT FIXTURES WITH THE ARCHITECT PRIOR TO PURCHASING.
- ALL LIGHTING FIXTURES INDICATED WITHIN THE LIGHTING FIXTURE SCHEDULE SHALL BE PROVIDED WITH ALL REQUIRED MOUNTING HARDWARE, CONNECTORS AND ANY OTHER NEEDED FIXTURE OPTIONS FOR A COMPLETE AND OPERATIONAL INSTALLATION AS INTENDED ON THE DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL REQUIRED COMPONENTS AT NO ADDITIONAL COST TO THE OWNER.
- THE E.C. SHALL COORDINATE CLOSELY WITH THE ARCHITECT AND/OR GENERAL CONTRACTOR FOR THE DESIRED MOUNTING METHODS OF THE LED LIGHT FIXTURES IN ALL LOCATIONS OF THE BUILDING AS SHOWN ON THE PLANS. THE E.C. SHALL COORDINATE AND VERIFY THE EXACT LOCATIONS FOR THE POWER SUPPLY (LOW-VOLTAGE TRANSFORMERS) WITH THE ARCHITECT AND/OR GENERAL CONTRACTOR PRIOR TO ROUGH-IN. CONTRACTOR SHALL PROVIDE ALL MOUNTING HARDWARE AS REQUIRED TO MOUNT THESE FIXTURES AS DIRECTED BY THE ARCHITECT.
- ELECTRICAL CONTRACTOR SHALL PROVIDE ADDITIONAL SHIELDING FOR LIGHTING FIXTURES AS REQUIRED TO OBTAIN AHJ APPROVED FOOTCANDLE LEVELS AT PROPERTY BOUNDARIES. ELECTRICAL CONTRACTOR SHALL PROVIDE FOOTCANDLE TESTING RESULTS AT PROPERTY LINES TO ENGINEER ON RECORD PRIOR TO PROJECT COMPLETION.

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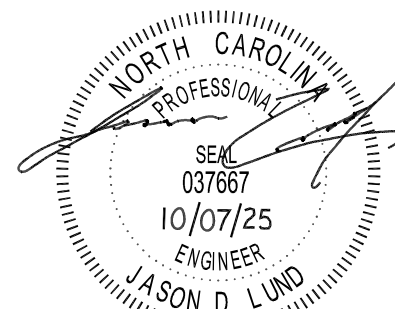
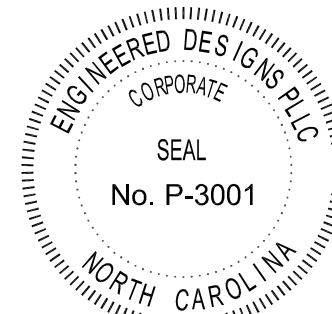
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EDI Project Number: 095-23

EAST RALEIGH PARK AND RIDE
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1426 WILDERS GROVE LN. AND
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RALEIGH, NC



REVISIONS

NO. DATE

PLAN INFORMATION

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DATE 10.07.2025

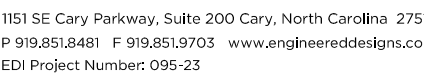
TITLE

ELECTRICAL SINGLE
LINE DIAGRAM

E5.1



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EDI Project Number: 095-23

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1451 N. HOPE RD.
RALEIGH NC**



REVISIONS

NO.	DATE
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PLAN INFORMATION

DATE 10.07.2025

TITLE

ELECTRICAL PANEL SCHEDULES

E6.1

PANEL "MDP"																									
CT	DESCRIPTION	LIGHT	RECP	MOTOR	HEAT	OTHER	C	EGC	N	W	OB	PHASE	OB	W	N	EGC	C	OTHER	HEAT	MOTOR	RECP	LIGHT	DESCRIPTION	CT	
1	PANEL LP1	1436	360	0	0	0	REFER TO SINGLE LINE DIAGRAM					A						0	0	0	69168	0	PANEL EVSE 4	2	
3		1448	0	1369	0	0		B					C					0	0	0	69168	0		3	
5		12	360	1369	0	0												0	0	0	69168	0		5	
7		...	...	...	...	...												...	...	...	...	...		...	7
9		...	...	...	...	...								B	...	...	...		...	...	...	...		...	...
11	...	...	...	...	...							C	...	...	...		...	...	...	...	...	...	...	11	
13	...	...	...	...	...							A	...	...	...		...	...	...	...	...	...	...	13	
15	...	...	...	...	...							B	...	...	...		...	...	...	...	...	...	...	15	
17	...	...	...	...	...							C	...	...	...		...	...	...	...	...	...	...	17	
19	...	...	...	...	...							A	...	...	...		...	...	...	...	...	...	...	19	
21	...	...	...	...	...							B	...	...	...		...	...	...	...	...	...	...	21	
23	...	...	...	...	...							C	...	...	...		...	...	...	...	...	...	...	23	
25	...	...	...	...	...							A	...	...	...		...	...	...	...	...	...	...	25	
27	...	...	...	...	...							B	...	...	...		...	...	...	...	...	...	...	27	
29	...	...	...	...	...							C	...	...	...		...	...	...	...	...	...	...	29	
31	...	...	...	...	...							A	...	...	...		...	...	...	...	...	...	...	31	
33	...	...	...	...	...							B	...	...	...		...	...	...	...	...	...	...	33	
35	...	...	...	...	...							C	...	...	...		...	...	...	...	...	...	...	35	
37	...	...	...	...	...							A	...	...	...		...	...	...	...	...	...	...	37	
39	...	...	...	...	...							B	...	...	...		...	...	...	...	...	...	...	39	
41	...	...	...	...	...							C	...	...	...		...	...	...	...	...	...	...	41	
VOLTAGE		208Y/120				PANEL LOAD SUMMARY		CONNECTED KVA	DEMAND FACTOR	NEC KVA	TOTALS:	KVA	AMPS	LOAD NOTES:											
PHASEWIRE		3 PHASE 4 WIRE				LIGHTING NOTE 1		2.9	125%	3.6	PHASE A:		71.0	591.4	1. LARGEST OF: NEC TABLE 220-12 OR CONNECTED LOAD.										
MAIN SIZE		800 AMPS				RECP NOTE 2		208.2	NEC	109.1	PHASE B:		72.0	599.9	2. <10KVA - 100% + >10KVA - 50%										
MAIN TYPE		M.C.B.				MOTOR NOTE 3		2.7	NEC	2.7	PHASE C:		70.9	590.9	3. INCLUDES 125% OF LARGEST MOTOR										
ENCLOSURE		NEMA 3R				HEAT		0.0	100%	0.0	TOTAL:		213.9	594.1	4. ---										
TYPE		PANELBOARD				OTHER		0.0	100%	0.0	PANEL NOTES:														
BUSING		COPPER				2. ---																			
BREAKER TYPE		BOLT ON				3. ---																			
MOUNTING		SURFACE				4. ---																			
MINIMUM AIC RATING		22 KAIC				TOTAL KVA		213.9			115.5	3. ---													
						KVA X 1000 / VOLTS X 1.73 = TOTAL AMPS		320.8	4. ---																

BUY AMERICA PROGRAM REQUIREMENTS

ALL PRODUCTS PROVIDED ON THIS PROJECT MUST BE MANUFACTURED IN COMPLIANCE WITH THE BUY AMERICA PROGRAM FOR FEDERALLY FUNDED TRANSPORTATION PROJECTS PER CODE OF FEDERAL REGULATIONS 49 CFR 661. THESE REQUIREMENTS ARE DISTINCT AND DIFFERENT FROM THOSE OF THE BUY AMERICAN ACT OF 1933.

00700
STANDARD GENERAL CONDITIONS
OF THE CONSTRUCTION CONTRACT

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*
 - a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

- b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.
 - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
 - d. A demand for money or services by a third party is not a Claim.
- 11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
 - 12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.
 - 13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
 - 14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.
 - 15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
 - 16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
 - 17. *Cost of the Work*—See Paragraph 13.01 for definition.
 - 18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
 - 19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
 - 20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
 - 21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.
23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.
 - a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
 - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
 - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.
32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals.
36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers’ instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
 - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
 - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:* The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:* The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:* The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - 1. does not conform to the Contract Documents;
 - 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - 3. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
 - 1. The word “furnish,” when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 - 2. The word “install,” when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 - 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.
 - 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

- F. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

- A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.
 - 4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.
- G. Nothing in the Contract Documents creates:
 - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
 - 2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

- A. *Standards Specifications, Codes, Laws and Regulations*
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. Abnormal weather conditions;
 - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
 - 4. Acts of war or terrorism.

- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
 2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
1. The circumstances that form the basis for the requested adjustment;
 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.
- Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.
- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.
 - C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
3. Technical Data contained in such reports and drawings.

- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

- C. *Reliance by Contractor on Technical Data:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents:* Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;
 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
 3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
 4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
 2. is of such a nature as to require a change in the Drawings or Specifications;
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- E. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;
 - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.
- F. *Underground Facilities; Hazardous Environmental Conditions:* Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review:* Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
 3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
 4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- F. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
 - c. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
 4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

- of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner’s termination rights under Article 16.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Alternative forms of insurance coverage, including but not limited to self-insurance and “Occupational Accident and Excess Employer’s Indemnity Policies,” are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.
- H. Contractor shall require:
 - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
 - 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
 - 1. include at least the specific coverages required;
 - 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 - 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;
 - 4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and
 - 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds:* The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
 - 1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
 - 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
 - 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and
5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
- C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.
1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

- A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.

- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.
- C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

- A. *Contractor's Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
 - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) has a proven record of performance and availability of responsive service; and
 - 4) is not objectionable to Owner.
- b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
- 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 Substitutes

- A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.
1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
 2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
 - a. will certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design;
 - 2) be similar in substance to the item specified; and
 - 3) be suited to the same use as the item specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from the item specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.09 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

- 1. Before submitting a Shop Drawing or Sample, Contractor shall:
 - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determine and verify:
 - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
 - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
 - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
- 2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.
 2. *Samples*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.
 3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. Resubmittal Procedures for Shop Drawings and Samples

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.
2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
 - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
 - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

- d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
- 2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 Contractor's General Warranty and Guarantee

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
 - 1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
 - 2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 - 2. normal wear and tear under normal usage.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
 - 1. Observations by Engineer;
 - 2. Recommendation by Engineer or payment by Owner of any progress or final payment;
 - 3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 - 4. Use or occupancy of the Work or any part thereof by Owner;
 - 5. Any review and approval of a Shop Drawing or Sample submittal;
 - 6. The issuance of a notice of acceptability by Engineer;
 - 7. The end of the correction period established in Paragraph 15.08;
 - 8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.
- E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 Delegation of Professional Design Services

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
 - 1. Checking for conformance with the requirements of this Paragraph 7.19;
 - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
 - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. An itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. The extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
 - 1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
 - 2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.
- C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.
- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

- A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
- B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 - 2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 - 3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and
 - 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

- A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

- B. If Owner has issued a Work Change Directive and:
 - 1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
 - 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
 2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
 3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).
- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will be determined as follows:
1. A mutually acceptable fixed fee; or
 2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
 - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
 - c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
 - d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
 - f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

- A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

- B. *Change Proposal Procedures*

- 1. *Submittal:* Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
- 2. *Supporting Data:* The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.
 - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
 - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

- 3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
- 4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

- A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:
 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

- C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.
 - 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 - 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
 5. Other costs consisting of the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

- 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

- 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
 - 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
 - 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.
- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.
- C. *Costs Excluded:* The term Cost of the Work does not include any of the following items:
 - 1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
 - 2. The cost of purchasing, renting, or furnishing small tools and hand tools.
 - 3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 - 4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 - 5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 - 6. Expenses incurred in preparing and advancing Claims.
 - 7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.
- D. *Contractor's Fee*
 - 1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
 - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
 - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
 - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
 - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
 - 2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

- E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances*: Contractor agrees that:
1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 3. by manufacturers of equipment furnished under the Contract Documents;
 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 Owner May Correct Defective Work

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 Progress Payments

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments*
 - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.
 - 2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. Review of Applications

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work;
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

- b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. The Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. The Contract Price has been reduced by Change Orders;
 - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
 - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or
 - l. Other items entitle Owner to a set-off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.
2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

- d. a list of all duly pending Change Proposals and Claims; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
- 3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Final Application and Recommendation of Payment:* If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such adjacent areas;
 - 2. correct such defective Work;
 - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
- D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

- A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
 - 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
 - 1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
 - 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
 - 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

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

18.10 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

**PROCEDURE FOR REPORTING NORTH CAROLINA SALES TAX
EXPENDITURES ON CITY OF RALEIGH CONTRACTS**
(for projects with reimbursable sales tax excluded from Bid)

1. The following procedure in handling the North Carolina Sales Tax is applicable to this project. Contractors shall comply fully with the requirements outlined hereinafter, in order that the owner may recover the amount of the tax permitted under the law. For the purposes of this section, "Sales Taxes" shall mean sales and use taxes paid to the State of North Carolina or to local governments in North Carolina.
 - (a) Reimbursable Sales Taxes are to be excluded from the bid price for this project.
 - (b) The City is entitled to refunds from the State of North Carolina for these reimbursable sales taxes. The Contractor that performs work under this contract is allowed to obtain a reimbursement from the City for those Sales Taxes for which the State will grant a refund to the City. The City will reimburse the Contractor, and the City later obtains a refund from the State.
 - (c) It shall be the general contractor's responsibility to furnish the City documentary evidence showing the materials used and sales tax paid by the general contractor and each of his subcontractors. Any county sales tax included in the contractor's statements must be shown separately from the state sales tax. If more than one county is shown, each county shall be listed separately.
 - (d) The documentary evidence shall be the attached Reimbursable Sales and Use Tax Statement. This evidence shall consist of a certified statement, by the general contractor and each of his subcontractors individually, showing total purchases of materials from each separate vendor and total sales taxes by each county paid each vendor. The certified statement must show the invoice number (s) covered and inclusive dates of such invoices. State sales tax shall be listed separately from county sales tax. If more than one county is shown, each county shall be listed separately. The invoices shall be provided to substantiate the information on the statement.
 - (e) Materials used from general contractor's or subcontractor's warehouse stock shall be shown in a certified statement at warehouse stock prices.
 - (f) The general contractor shall not be required to certify the subcontractor's statements. However, the subcontractor may submit for reimbursement by certifying a Reimbursable Sales and Use Tax Statement, submitting it to the general contractor for the general contractor to submit with the pay application for the properties listed on that form. The City will make the reimbursement payable to the Contractor.
 - (g) The documentary evidence to be furnished to owners eligible for Reimbursable Sales Tax refunds covers sales and/or use taxes paid on building materials used by general contractors and subcontractors in the performance of contracts with churches,

orphanages, hospitals not for profit, educational institutions not operated for profit and other charitable or religious institutions or organizations not operated for profit and incorporated cities, towns and counties in this State. The documentary evidence is to be submitted to the above-named institutions, organizations and governmental units to be included in claims for refunds to be prepared and submitted by them to obtain refunds provided by G.S. 105-164.14 and is to include the purchase of building materials, supplies, fixtures and equipment which become a part of or annexed to buildings or structures being erected, altered or repaired under contracts with such institutions, organizations or governmental units.

- (h) The Contractor may seek reimbursement separately from, but at the same time as, the application for payment is made for the properties that were taxed. The Contractor shall not file for reimbursement for Sales Taxes before the Contractor has the right to file an application for payment for the properties that were taxed.
- 2. If the State refuses to refund any such Sales Tax to the City, or if after a refund is made, the City is told to return a refund to the State, the Contractor shall upon demand repay the City for the amount of the failed refunds.
- 3. The contractor or contractors to whom an award is made on this project will be required to follow the procedure outlined above.
- 4. The contractor is advised that all requests for payment, partial or final, for work completed under this contract must include a sales tax report submitted in accordance with the procedures outlined above.

North Carolina Reimbursable Sales and Use Tax Statement

(Paid During This Estimate Period)

Project _____ Project Location _____ County _____ Estimate No. _____

Name of Contractor _____ Period Ending _____

Date	Vendor	Type of Property Purchased	Invoice Number	Invoice Amount	State Tax 4.75%	County Tax 2.00%	Total Tax 6.75%	County
TOTALS								

The undersigned individual certifies (1) that he or she is an employee or principal of the Contractor that is filing this form with the City to request reimbursement for N.C. State and local sales and use taxes that the Contractor has paid, (2) that the above listed vendors were paid sales tax upon purchases of building materials during the period covered by the construction estimate, and the property upon which such taxes were paid with or will be used in the performance of this contract, (3) that no tax on purchases or rentals of tools and/or equipment is included in the above list, (4) that all of the material above became a part of or is annexed to the building or structure being erected, altered or repaired, and (5) that all of the information on this form, and any additional pages added to this page, if any, is true and accurate.

_____ County, North Carolina

Signed and sworn to (or affirmed) before this day by _____
(name of principal) (signature of principal)

Date: _____
Notary Public's Signature

(Notary's printed or typed name, Notary Public)

(Official Seal) My commission expires: _____

North Carolina Reimbursable Sales and Use Tax Statement by Subcontractor

(Paid During This Estimate Period)

Project _____ Project Location _____ County _____ Estimate No. _____

Name of Subcontractor _____ Period Ending _____

Date	Vendor	Type of Property Purchased	Invoice Number	Invoice Amount	State Tax 5.50%	County Tax 2.25%	Total Tax 7.75%	County
TOTALS								

The undersigned individual certifies (1) that he or she is an employee or principal of the Subcontractor that is submitting this form with the Contractor so that the Contractor may request reimbursement for N.C. State and local sales and use taxes that the Subcontractor has paid, (2) that the above listed vendors were paid sales tax upon purchases of building materials during the period covered by the construction estimate, and the property upon which such taxes were paid with or will be used in the performance of this contract, (3) that no tax on purchases or rentals of tools and/or equipment is included in the above list, (4) that all of the material above became a part of or is annexed to the building or structure being erected, altered or repaired, and (5) that all of the information on this form, and any additional pages added to this page, if any, is true and accurate.

_____ County, North Carolina

Signed and sworn to (or affirmed) before this day by _____
(name of principal) (signature of principal)

Date: _____
Notary Public's Signature

(Notary's printed or typed name, Notary Public)

(Official Seal) My commission expires: _____

"General Decision Number: NC20260090 01/02/2026

Superseded General Decision Number: NC20250090

State: North Carolina

Construction Type: Highway

Counties: Brunswick, Cumberland, Currituck, Edgecombe, Franklin, Greene, Hoke, Johnston, Nash, New Hanover, Onslow, Pender, Pitt, Wake and Wayne Counties in North Carolina.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Modification Number	Publication Date
0	01/02/2026

SUNC2014-005 11/17/2014

	Rates	Fringes
BLASTER.....	\$ 21.04	
CARPENTER.....	\$ 13.72	
CEMENT MASON/CONCRETE FINISHER...	\$ 14.48	
ELECTRICIAN		
Electrician.....	\$ 17.97	
Telecommunications		
Technician.....	\$ 16.79	.63
IRONWORKER.....	\$ 16.02	
LABORER		
Asphalt Raker and Spreader..	\$ 12.46	
Asphalt Screed/Jackman.....	\$ 14.33	
Carpenter Tender.....	\$ 12.88	
Cement Mason/Concrete		
Finisher Tender.....	\$ 12.54	
Common or General.....	\$ 10.20	
Guardrail/Fence Installer...	\$ 12.87	
Pipelayer.....	\$ 12.17	
Traffic Signal/Lighting		

Installer.....\$ 14.89

PAINTER

Bridge.....\$ 24.57

POWER EQUIPMENT OPERATOR

Asphalt Broom Tractor.....\$ 11.85

Bulldozer Fine.....\$ 17.04

Bulldozer Rough.....\$ 14.34

Concrete Grinder/Groover....\$ 20.34

2.30

Crane Boom Trucks.....\$ 20.54

Crane Other.....\$ 20.08

Crane Rough/All Terrain.....\$ 20.67

Drill Operator Rock.....\$ 14.38

Drill Operator Structure....\$ 21.14

Excavator Fine.....\$ 16.60

Excavator Rough.....\$ 14.00

Grader/Blade Fine.....\$ 18.47

Grader/Blade Rough.....\$ 14.62

Loader 2 Cubic Yards or
Less.....\$ 13.76

Loader Greater Than 2
Cubic Yards.....\$ 14.14

Material Transfer Vehicle
(Shuttle Buggy).....\$ 15.18

Mechanic.....\$ 17.55

Milling Machine.....\$ 15.36

Off-Road Hauler/Water
Tanker.....\$ 11.36

Oiler/Greaser.....\$ 13.55

Pavement Marking Equipment..\$ 12.11

Paver Asphalt.....\$ 15.59

Paver Concrete.....\$ 18.20

Roller Asphalt Breakdown....\$ 12.45

Roller Asphalt Finish.....\$ 13.85

Roller Other.....\$ 11.36

Scraper Finish.....\$ 12.71

Scraper Rough.....\$ 11.35

Slip Form Machine.....\$ 16.50

Tack Truck/Distributor
Operator.....\$ 14.52

TRUCK DRIVER

GVWR of 26,000 or Less.....\$ 11.12

GVWR of 26,001 Lbs or
Greater.....\$ 12.37

WELDERS – Receive rate prescribed for craft performing
operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the contractor must pay all covered workers at least \$13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical

order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007

6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

- a) a survey underlying a wage determination
- b) an existing published wage determination
- c) an initial WHD letter setting forth a position on a wage determination matter
- d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor

200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION

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List of Subcontractors/SUPPLIERS FORM A

Note a correctly completed Form A will list all subcontractors and suppliers a bidder's plan to directly utilize. Each company will have 2nd or 3rd tier subcontractors or suppliers should submit individual Form A.

Form A instructions to fill out form

1. **Bidders Name** is the name of the company that will be entering into contract agreements or purchasing supplies and materials from subcontractors listed in the document
2. **Project Name** is the name of the of the identification listed on the solicitation
3. **Name and address** of each subcontractor/supplier that is intended to do work on the project:
 - a: **Annual Gross Receipts range** must be identified for each company according to the range provided
4. **Contact Person and Phone number** (plus email address if available)
5. **Age of Firm** approximate age of firm
6. **Description of Work** or supplies to be provided by the subcontractor
7. **NAICS Code** (if available) for the work provided by the subcontractor
8. **NCDOT Reporting number #** (specifically for subcontractors and suppliers)
9. **Total Project \$** dollars that are projected to be spent with each subcontractor/supplier
10. **% of the total Bid amount** is the percent of dollars to be spent with each subcontractor or supplier
 - Calculations = **Total projected dollars** divided by **Total Bid Amount**
 - Total Bid amount includes the contingency amount
11. Print additional copies of the extended Form A to list all subcontractors or suppliers which do not fit on one page. On each sheet the company with subcontractors and suppliers must **Print**:
 - The company name under **Bidder's name**,
 - the solicitation title next **Project Name**
12. The project totals including for all vendors listed on the company's Form A and extended it Form A must be listed on the 1st page including the following
 - The **Total bid amount** in \$ dollars
 - Percentage% of the total subcontractors

13. Read the “**Certification statement**” before signing your form A

14. An authorized official from your company must sign the Form. That official must then **Print**:

- Name
- Title
- Submittal Date

Note by submitting this form the prime will be contractually held to the amounts listed on the Forms A and tiered forms A submitted their subcontractors.

15. Additional questions on filling relating to the completion of the form should be directed to the contact provided included with the solicitation.

Note: Primes ,submitting bids/proposals, must include entries of their own subcontractors on the Form A.

List of Subcontractors/SUPPLIERS FORM A

Project Subcontractor/Supplier. Note this **MUST** be submitted with your Bid. Make copies as needed.

Bidders Name _____ Project Name _____ Below ALL subcontractors AND suppliers that you intend to use on this Contract. Continue listing on the supplemental form

[illegible]

Please read the following "Certification" statement before signing. "The undersigned certifies that he/she has read understand and agree to be bound by City program Requirements including the accompanying FORM(s) A and the other terms and conditions in the Notice to Bidders. The undersigned further certifies that he/she is legally authorized by the Bidder to make the statement and representation and that said statements and representations are true and correct to the best of his/her knowledge and belief. It is the intent by the undersigned to enter into a formal agreement(s) with subcontractors/suppliers named on this Form conditioned upon execution of a contract with the City. All subcontractor /supplier must provide proof of status or receive confirmation of the status from the City's Transportation Supervisor prior to contract award. The undersigned understands and agrees that if any of the statements and representations are made by the Bidder knowing them to be false, or if there is a failure of the successful Bidder (i.e., the Contractor) to implement any of the stated agreements, intentions, objective, goals, commitments and substitutions set forth herein without prior approval by the City's Transportation Supervisor or a designee, then in any such events the Contractors act of failure to act, as the case may be, shall constitute a material breach of the contract, entitling the City to terminate the contract for default. The right to so terminate shall be in addition to, and not in lieu of, any other rights and remedies the City may have under the contract, or otherwise. Additionally, the Contractor will be subject to the loss of any future contract awards".

Signature of Authorized Official	Printed Name	Title	Submittal Date
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PAYMENT AFFIDAVIT- SUBCONTRACTOR/ SUPPLIER UTILIZATION

Contractors must submit this form with each request for payment from the City of Raleigh, including any invoice or request for final payment. Requests for payment are limited to work that has been completed and approved for all subcontractors and suppliers in connection with the Contract. Copy this form as needed. The Contractor on the Prime Contract (i.e., Prime) is responsible for collecting and submitting this Affidavit from all subsequent lower tier contractors.

Section 1 : PROJECT INFORMATION

Project Name			
Contractor Name		Purchase Order #	
Total Contract Amount		Invoice Amount	\$
Payment Period	___/___/20__ through ___/___/20__		City Department
FINAL PAYMENT ☐ Check this box only when submitting Final Pay request.			

Section 2: PAYMENTS TO SUBCONTRACTORS

Complete the chart below for all subcontractors used on the Project/Contract regardless of dollar amount.

Company Name	Work Performed	Percentage of Total Contract	Percent of Subcontract Completed	Payment this Period	Cumulative Payments to Date

Section 3: PAYMENTS TO SUPPLIERS

All suppliers providing goods under City contracts must be listed on the Sales Tax Statement submitted with each pay request. The City may request, on a case-by-case basis, that the Contractor require certain suppliers to be registered in the Raleigh Supplier Connection System and may withhold payment of any amounts due the Contractor in the event the Contractor fails to comply with such request.

The undersigned certifies the preceding chart is a true and accurate statement of all payments that have been made to subcontractors on this Project/Contract, and that all Suppliers providing goods under this contract have been listed in the Sales Tax Statements submitted to the City in connection with this Payment Affidavit. If no subcontractors or suppliers are listed on the preceding chart or Sales Tax Statements, the undersigned certifies that no subcontractors or suppliers were used in performing the Project/Contract for the payment period indicated. Failure to provide accurate and truthful information is a violation of the City of Raleigh Policy and may result in the sanctions prescribed therein.

This day of 20____

Signature

Print Name and Title

To be completed by City for FINAL PAYMENT

Total Paid to Contractor \$

Prime Contractor

Total Paid to Subcontractors \$

FEDERAL AND STATE REQUIREMENTS AND SPECIAL CONDITIONS

for **TECHNOLOGY EQUIPMENT** **Facility improvements and installations** *(Over \$2,000 and under \$150,000)*

1. General

The work performed under this contract will be financed, in part, by grants provided under programs of the Federal Transit Administration. Citations to federal law, regulation, and guidance references include, but are not limited to, the Master Agreement FTA MA (as amended); FTA Circular 4220 (as amended); "Best Practices Procurement Manual" (as amended); Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards," 2 C.F.R part 1201, dated December 19, 2014, will supersede and apply in lieu of U.S. DOT's common grant rules, 49 C.F.R. parts 18 and 19, State and Local Governments and Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations and any subsequent amendments or revisions thereto.

THE FOLLOWING MAY BE USED SYNONYMOUSLY:
"BIDDER" AND "CONTRACTOR"
"PURCHASER", "PROCURING AGENCY" AND "OWNER"

2. Federal Changes

Contractor shall at all times comply with all applicable Federal Transit Administration (FTA) regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between Purchaser and FTA, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.

3. Notification of Federal Participation

To the extent required by Federal law, the State of North Carolina agrees that, in administering any Federal assistance Program or Project supported by the underlying Grant Agreement or Cooperative Agreement, any request for proposals, solicitation, grant application, form, notification, press release, or other publication involving the distribution of FTA assistance for the Program or the Project that it will identify the FTA grant source by listing the Catalog of Federal Domestic Assistance Number of the program. The following FTA grant programs will be eligible to participate in this bid, 20.505, 20.507, 20.500, 20.513, 20.509, 20.516, 20.519, 20.521, 20.525, and 20.526. Federal funding assistance up to eighty (80%) percent may be provided.

4. Definitions

Third Party Agreement, in accordance with the Master Agreement unless FTA determines otherwise in writing, includes all of the following agreements, such as:

- (1) Third party contracts,
- (2) Leases,

- (3) Third party subcontracts; and
- (4) Other similar arrangements or agreements.

Third Party Participant, in accordance with the Master Agreement unless FTA determines otherwise in writing, includes all of the following participants, such as:

- (1) Third party contractors,
- (2) Lessees,
- (3) Third party subcontractors, and
- (4) Other participants in the Project

5. Conflict of Interest

No employee, officer, board member, or agent of the Owner shall participate in the selection, award, or administration of a contract supported by Federal Transit Administration (FTA) funds if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when the employee, officer, board member, or agent, any member of his or her immediate family, his or her partner, or an organization that employs, or is about to employ any of the above, has a financial or other interest in the firm selected for award.

6. Lobbying

Byrd Anti-Lobbying Amendment, 31 U.S.C. 1352, as amended by the Lobbying Disclosure Act of 1995, PL 104-65 (2 U.S.C. §1601, et seq.). Contractors who apply or bid for an award of \$250,000 or more shall file the certification required by 49 CFR part 20, "New Restrictions on Lobbying." Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier shall comply with Federal statutory provisions to the extent applicable prohibiting the use of Federal assistance funds for activities designed to influence Congress or a State legislature on legislation or appropriations, except through proper official channels. Each tier shall also disclose the name of any registrant under the Lobbying Disclosure Act of 1995 who has made lobbying contacts on its behalf with non-Federal funds with respect to that Federal contract, grant or award covered by 31 U.S.C. 1352. Such disclosures are forwarded from tier to tier up to the recipient.

7. Civil Rights

(1) **Nondiscrimination on the Basis of Age** – The Contractor agrees to comply with all applicable requirements of the Age Discrimination Act of 1975, as amended, 42 U.S.C. §§ 6101 *et seq.*, and with implementing U.S. Health and Human Services regulations, "Nondiscrimination on the Basis of Age in Programs or Activities Receiving Federal Financial Assistance, 45 C.F.R. Part 90, which prohibit discrimination against individuals on the basis of age.

The Age Discrimination in Employment Act (ADEA) 29 U.S.C. §§ 621 through 634 and with implementing U.S. Equal Employment Opportunity Commission (U.S. EEOC) regulations, "Age Discrimination in Employment Act," 29 C.F.R. Part 1625, which prohibits discrimination against individuals on the basis of age.

(2) **Access for Individuals with Disabilities** - The Contractor agrees to comply with

49 U.S.C. § 5301(d), which states the Federal policy that elderly individuals and individuals with disabilities have the same right as other individuals to use public transportation services and facilities, and that special efforts shall be made in planning and designing those services and facilities to implement transportation accessibility rights for elderly individuals and individuals with disabilities. The Contractor also agrees to comply with all applicable provisions of section 504 of the Rehabilitation Act of 1973, as amended, with 29 U.S.C. § 794, which prohibits discrimination on the basis of disability; with the Americans with Disabilities Act of 1990 (ADA), as amended, 42 U.S.C. §§ 12101 *et seq.*, which requires that accessible facilities and services be made available to individuals with disabilities; and with the Architectural Barriers Act of 1968, as amended, 42 U.S.C. §§ 4151 *et seq.*, which requires that buildings and public accommodations be accessible to individuals with disabilities. In addition, the Contractor agrees to comply with applicable Federal regulations and directives and any subsequent amendments thereto, except to the extent the Federal Government determines otherwise in writing, as follows:

- (1) U.S. DOT regulations "Transportation Services for Individuals with Disabilities (ADA)" 49 C.F.R. Part 37;
- (2) U.S. DOT regulations "Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance," 49 C.F.R. Part 27;
- (3) Joint U.S. Architectural and Transportation Barriers Compliance Board (U.S. ATBCB) U.S. DOT regulations, "Americans with Disabilities (ADA) Accessibility Specifications for Transportation Vehicles," 36 C.F.R. Part 1192 and 49 C.F. R. Part 38;
- (4) U.S. DOJ regulations "Nondiscrimination on the Basis of Disability in State and Local Government Services," 28 C.F.R. Part 35;
- (5) U.S. DOJ regulations "Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities." 28 C.F.R. Part 36;
- (6) U.S. GSA regulations "Accommodations for the Physically Handicapped," 41 C.F.R. Subpart 101-19;
- (7) U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. Part 1630;
- (8) U.S. Federal Communications Commission regulations "Telecommunications Relay Services and Related Customer Premises Equipment for the Hearing and Speech Disabled," 49 C.F.R. Part 64, Subpart F;
- (9) U.S. Architectural and Transportation Barriers Compliance Board regulations, "Electronic and Information Technology Accessibility Standards." 36 C.F.R. Part 1194;
- (10) FTA regulations, "Transportation of Elderly and Handicapped Persons," 49 C.F.R. part 609; and
- (11) Federal regulations, "Miscellaneous Civil Rights Amendments (RRR)," pertaining to nondiscrimination on the basis of disability within 49 C.F.R. Parts 27, 37, and 38 were published in 79 Fed. Reg. 21402, April 16, 2014; and

- (12) Federal civil rights and nondiscrimination directives implementing the foregoing Federal laws and regulations, except to the extent the Federal Government determines otherwise in writing.

(3) **Drug or Alcohol Abuse-Confidentiality and Other Civil Rights Protections.** To the extent applicable, the Contractor agrees to comply with the confidentiality and other civil rights protections of the Drug Abuse Office and Treatment Act of 1972, as amended, 21 U.S.C. §§ 1101 *et seq.*, with the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970, as amended, 42 U.S.C. §§ 4541 *et seq.*, and with the Public Health Service Act of 1912, as amended, 42 U.S.C. §§ 290dd through 290dd-2, and any amendments thereto.

(4) **Other Nondiscrimination Laws.** The Contractor agrees to comply with applicable provisions of other Federal laws and regulations, and follow applicable directives prohibiting discrimination, except to the extent that the Federal Government determines otherwise in writing.

(5) The Contractor also agrees to include these requirements in each subcontract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties.

(6) Remedies for failure to comply with applicable Federal Civil Rights laws and Federal regulations may be enforced as provided in those Federal laws or Federal regulations.

8. Clean Air Act

(a) The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to Section 306 of the Clean Air Act as amended, 42 U.S.C. § 7606, and other applicable provisions of the Clean Air Act, as amended, 42 U.S.C. §§ 7401 through 7671q. The Contractor agrees to report any violation to the Purchaser and understands and agrees that the Purchaser will, in turn, report each violation as required to assure notification to the State and/or FTA and the appropriate EPA Regional Office.

(b) The Contractor also agrees to include these requirements in each subcontract exceeding \$250,000 financed in whole or in part with Federal Assistance provided by FTA.

9. Clean Water

(a) The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to Section 508 of the Clean Water Act, as amended, 33 U.S.C. § 1368, and other applicable requirements of the Clean Water Act, as amended, 33 U.S.C. §§ 1251 through 1377. The Contractor agrees to report each violation as required to assure notification to FTA and the appropriate EPA Regional Office.

(b) The Contractor also agrees to include these requirements in each subcontract exceeding \$250,000 financed in whole or in part with Federal assistance provided by FTA.

10. Environmental Protection *(requirements for environmental studies)*

The Contractor agrees to comply with all applicable requirements of the National Environmental Policy Act of 1969, as amended, (NEPA) 42 U.S.C. §§ 4321 through 4335 (as restricted by 42 U.S.C. § 5159, if applicable); Executive Order No. 11514, as amended, "Protection and Enhancement of Environmental Quality," 42 U.S.C. § 4321

note; FTA statutory requirements at 49 U.S.C. § 5323(c)(2)), as amended by MAP-21, ; U.S. Council on Environmental Quality regulations pertaining to compliance with NEPA, 40 C.F.R. Parts 1500 through 1508; and joint FHWA FTA regulations, "Environmental Impact and Related Procedures," 23 C.F.R. Part 771 and 49 C.F.R. Part 622; were published in the Federal Register, 78 Fed. Reg. 8963, February 7, 2013; and other applicable Federal environmental protection regulations that may be promulgated at a later date. The Contractor agrees to comply with the applicable provisions of 23 U.S.C. § 139 "Efficient environmental reviews for project decision making", pertaining to environmental procedures, and 23 U.S.C. § 326, pertaining to Purchaser's responsibility for categorical exclusions, in accordance with the provisions of joint FHWA/FTA final guidance, "Environmental Review Process (Public Law 109-59)," 71 Fed. Reg. 66576 *et seq.* November 15, 2006. Joint FHWA and FTA final guidance, "Interim Guidance on MAP-21 Section 1319 Accelerated Decisionmaking in Environmental Reviews," dated January 14, 2013, and any applicable Federal directives that may be issued at a later date, except to the extent that FTA determines otherwise in writing.

11. Energy Conservation

The Contractor agrees to comply with mandatory standards and policies relating to energy efficiency that are contained in the state energy conservation plans issued in compliance with the Energy Policy and Conservation Act, 42 U.S.C. Sect. 6321 *et seq.*

12. Fly America

The Contractor agrees to comply with 49 U.S.C. 40118 (the "Fly America" Act) in accordance with the General Services Administration's regulations at 41 CFR Part 301-10, which provide that recipients and subrecipients of Federal funds and their contractors are required to use U.S. Flag air carriers for U.S. Government-financed international air travel and transportation of their personal effects or property, to the extent such service is available, unless travel by foreign air carrier is a matter of necessity, as defined by the Fly America Act. The Contractor shall submit, if a foreign air carrier was used, an appropriate certification or memorandum adequately explaining why service by a U.S. flag air carrier was not available or why it was necessary to use a foreign air carrier and shall, in any event, provide a certificate of compliance with the Fly America requirements. The Contractor agrees to include the requirements of this section in all subcontracts that may involve international air transportation.

13. Buy America

The contractor agrees to comply with 49 U.S.C. § 5323(j), as amended by MAP-21 and 49 C.F.R. part 661, to the extent consistent with MAP-21, and subsequent amendments to those regulations that may be promulgated. The Contractor also agrees to comply with FTA directives to the extent those directives are consistent with MAP-21, except to the

extent that FTA determines otherwise in writing. Buy America requirements state that Federal funds may not be obligated unless steel, iron, and manufactured products used in FTA-funded projects are produced in the United States, unless a waiver has been granted by FTA or the product is subject to a general waiver. General waiver requirements are listed in 49 CFR 661.7. Appendix A grants a general public interest waiver from the Buy America requirements that apply to microprocessors, computers, microcomputers, or software, or other such devices, which are used solely for the purpose of processing or storing data. This general waiver does not extend to a product or device which merely contains a microprocessor or microcomputer and is not used solely for the purpose of processing or storing data. Small purchases (currently less than \$250,000) made with capital, operating, or planning funds are also exempt from the Buy America requirements.

The Buy America requirements flow down from FTA recipients and subrecipients to first tier contractors, who are responsible for ensuring that lower tier contractors and subcontractors are in compliance.

Effective June 20, 2018 small purchases (under the \$250,000 threshold) made with FTA funds, will not be subject to the Buy America requirement. The value of small purchases should be determined by using "contract price" and not "unit price".

14. Cargo Preference

46 U.S.C. 55305 and 46 CFR Part 381 impose cargo preference requirements in contracts and subcontracts in which equipment, materials or commodities may be transported by ocean vessel in carrying out the project. If the Contractor has knowledge of or anticipates any equipment, materials or commodities that may be shipped by ocean vessel, the Contractor is obligated to inform the Owner, so that additional requirements and clauses may be attached to this Contract.

15. Davis-Bacon Act

Davis-Bacon Act, as amended, 40 U.S.C. §§ 3141 *et seq.*, pursuant to FTA enabling legislation requiring compliance with the Davis-Bacon Act at 49 U.S.C. § 5333(a), and implementing U.S. DOL regulations, "Labor Standards Provisions Applicable to Contracts Governing Federally Financed and Assisted Construction (also Labor Standards Provisions Applicable to Nonconstruction Contracts Subject to the Contract Work Hours and Safety Standards Act)," 29 C.F.R. Part 5;

The Davis-Bacon and Copeland Acts are codified at 40 USC 3141, *et seq.* and 18 USC 874. The Acts apply to grantee construction contracts and subcontracts that "at least partly are financed by a loan or grant from the Federal Government." 40 USC 3145(a), 29 CFR 5.2(h), 49 CFR 18.36(i)(5). The Acts apply to any construction contract over \$2,000. 40 USC 3142(a), 29 CFR 5.5(a). 'Construction,' for purposes of the Acts, includes "actual construction, alteration and/or repair, including painting and decorating." 29 CFR 5.5(a). The requirements of both Acts are incorporated into a single clause (see 29 CFR 3.11) enumerated at 29 CFR 5.5(a) and reproduced below.

Davis-Bacon and Copeland Anti-Kickback Acts

(1) Minimum wages - (i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages

and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph (1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) Except with respect to helpers as defined as 29 CFR 5.2(n)(4), the work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) With respect to helpers as defined in 29 CFR 5.2(n)(4), such a classification prevails in the area in which the work is performed.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including

the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(v)(A) The contracting officer shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(v) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(2) Withholding - The [insert *name of grantee*] shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the [insert ***name of grantee***] may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records - (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the [insert ***name of grantee***] for transmission to the Federal Transit Administration. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under section 5.5(a)(3)(i) of Regulations, 29 CFR part 5. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), U.S. Government Printing Office, Washington, DC 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the

payment of the persons employed under the contract and shall certify the following:
(1) That the payroll for the payroll period contains the information required to be maintained under section 5.5(a)(3)(i) of Regulations, 29 CFR part 5 and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the Federal Transit Administration or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees - (i) Apprentices - Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered

program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator of the Wage and Hour Division of the U.S. Department of Labor determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees - Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity - The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) Compliance with requirements of the Copeland "Anti-Kickback" Act, as amended - The contractor shall comply with the requirements of 18 U.S.C. § 874 and 40 U.S.C. § 3145, and implementing U.S. DOL regulations, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in part by Loans or Grants from the United States," 29 C.F.R. Part 3, which are incorporated by reference in this contract.

(6) Subcontracts - The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the Federal Transit Administration may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) Contract termination: debarment - A breach of the contract clauses in 29 CFR 5.5

may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act requirements - All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes concerning labor standards - Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility - (i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

16. Debarment and Suspensions

This contract is a covered transaction for purposes of 2 CFR Part 1200, which adopts and supplements the provisions of U.S. Office of Management and Budget (U.S. OMB) "Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement)," 2 CFR Part 180. As such, the contractor is required to verify that none of the contractor, its principals, as defined at 2 CFR 180.995, or affiliates, as defined at 2 CFR 180.905, are excluded or disqualified as defined at 2 CFR 180.940, 180.935 and 180.945.

The contractor is required to comply with 2 CFR 180, Subpart C and must include the requirement to comply with 2 CFR 180, Subpart C in any lower tier covered transaction it enters into.

By signing and submitting its bid or proposal, the bidder or proposer certifies as follows:

The certification in this clause is a material representation of fact relied upon by the **Procuring Agency**. If it is later determined that the bidder or proposer knowingly rendered an erroneous certification, in addition to remedies available to **Procuring Agency**, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment. The bidder or proposer agrees to comply with the requirements of 2 CFR 180, Subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

The Procuring Agency agrees and assures that its third party contractors and lessees will review the "Excluded Parties Listing System" at <https://www.sam.gov> before entering into any subagreement, lease or third party contract.

The Procuring Agency will be reviewing all third party contractors under the Excluded Parties Listing System at <https://www.sam.gov> before entering into any contracts.

If the Procuring Agency, recipient, or subrecipient suspends, debar, or takes similar action against a Third Party Participant or individual, the Agency, recipient, or subrecipient will provide immediate written notice to the:

- (a) NCDOT/Public Transportation Division,
- (b) FTA Regional Counsel for the Region in which the Agency is located or implements the Project,
- (c) FTA Project Manager if the Project is administered by FTA Headquarters Office, or
- (d) FTA Chief Counsel.

The requisite Debarment and Suspension Certification is included as ATTACHMENT D (attach additional statement if necessary) and must be executed for contracts of \$25,000 or more and prior to the award of the contract.

17. Termination or Cancellation of Contract

The Owner (Grant Recipient) may terminate this contract, in whole or in part, at any time by written notice to the Contractor when it is in the Owner's or Government's best interest. The Owner shall terminate by delivering to the Contractor a Notice of Termination specifying the nature, extent, and effective date of the termination. Upon receipt of the notice, the Contractor shall (1) immediately discontinue all services affected (unless the notice directs otherwise), and (2) deliver to the Owner all data, reports, estimates, summaries, and other information and materials accumulated in performing this contract, whether completed or in process. The Contractor shall be paid for the products delivered up to the time of termination. The Contractor shall promptly submit its termination claim to the Owner to pay the Contractor. If the Contractor has any property in its possession belonging to the Owner, the Contractor will account for the same, and dispose of it in the manner the Owner directs. A 30-day notice of termination shall be required.

If the termination is for the convenience of the Owner shall make an equitable adjustment in the contract price but shall allow no anticipated profit on unperformed services.

18. Breach of Contract

If the Contractor fails to make delivery of the equipment, supplies, or services within the specified terms of the contract, or fails to perform within the provisions of the contract, the contract may be terminated by reason of default or breach. A written notice of default or breach of contract shall be presented to the Contractor within three (3) working days of such failure. The Contractor will only be paid the contract price for equipment, supplies, or services delivered and accepted in accordance with the requirements set forth in the contract.

If it is determined that the Contractor had an excusable reason for not performing, such as a strike, fire, or flood, events which are not the fault of or are beyond the control of the Contractor, the Owner, after setting up a new delivery of performance schedule, may allow the Contractor to continue work, or treat the termination as a termination for convenience.

The Owner in its sole discretion may, in the case of breach of contract, allow the Contractor a specified period of time in which to correct the defect. In such case, the notice of termination will state the time period in which the correction is permitted and other appropriate conditions.

If Contractor fails to remedy to the Owner's satisfaction the breach or default or any of the terms, covenants, or conditions of this contract within twenty (20) days after written notice from the Owner setting forth the nature of said breach or default, the Owner shall have the right to terminate the Contract without any further obligation to Contractor. Any such termination for default shall not in any way operate to preclude the Owner from also pursuing all available remedies against Contractor and its sureties for said breach or default.

If there is credible evidence that a Third Party Participant (Contractor) has submitted a false claim under the False Claims Act, 31 U.S.C. § 3729 *et seq.*, or has committed a criminal or civil violation of law pertaining to fraud, conflict of interest, bribery, gratuity, or similar misconduct involving Federal funding, notification of FTA is required.

If a legal matter as described above emerges, the Recipient must promptly notify the U.S. DOT Inspector General, in addition to the FTA Chief Counsel or FTA Regional Counsel for the Region in which the Recipient is located and the NCDOT.

19. Resolution of Disputes

Disputes - Disputes arising in the performance of this Contract which are not resolved by agreement of the parties shall be decided in writing by the authorized representative of the Owner. This decision shall be final and conclusive unless within ten (10) days from the date of receipt of its copy, the Contractor mails or otherwise furnishes a written appeal to the authorized representative of the Owner. In connection with any such appeal, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its position. The decision of the authorized representative of the Owner shall be binding upon the Contractor and the Contractor shall abide by the decision.

Performance During Dispute - Unless otherwise directed by the Owner, the Contractor shall continue performance under this Contract while matters in dispute are being resolved.

Claims for Damages - Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the party or of any of his employees, agents or others for whose acts he is legally liable, a claim for damages therefor shall be made in writing to such other party within a reasonable time after the first observance of such injury or damage.

Remedies - Unless this contract provides otherwise, all claims, counterclaims, disputes and other matters in question between the Owner and the Contractor arising out of or relating to this agreement or its breach will be decided by arbitration if the parties mutually agree, or in a court of competent jurisdiction within the State in which the Owner is located.

Rights and Remedies - The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law. No action or failure to act by the Owner, Architect or

Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

20. No Federal Government Obligations to Third Parties

The Purchaser and Contractor acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this contract and shall not be subject to any obligations or liabilities to the Purchaser, Contractor, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying contract.

The Contractor agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

21. Federal Tax Liability and Recent Felony Convictions

(1) Transactions Prohibited.

(i) The Recipient agrees that, prior to entering into any Third Party Agreement with any private corporation, partnership, trust, joint-stock company, sole proprietorship, or other business association, the Recipient will obtain from the prospective Third Party Participant a certification that the Third Party Participant—

(A) Does not have any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability; and

(B) Was not convicted of the felony criminal violation under any Federal law within the preceding 24 months.

(ii) If the prospective Third Party Participant cannot so certify, the Recipient agrees to refer the matter to FTA and not to enter into any Third Party Agreement with the Third Party Participant without FTA's written approval.

(2) Flow-Down. The Recipient agrees to require all Third Party Participants to flow this requirement down to participants at all lower tiers, without regard to the value of any subagreement.

22. Trafficking in Persons.

- 1) *Legal Authorities.* The Recipient agrees to comply and assures the compliance of each Subrecipient, with federal requirements and guidance, including:
 - i. Section 106(g) of the Trafficking Victims Protection Act of 2000 (TVPA), as amended, 22 U.S.C. § 7104(g); and
 - ii. The terms of this section 4(f), which have been derived from U.S. OMB regulatory guidance, “Award Term for Trafficking in Persons,” 2 CFR Part 175, per U.S. OMB’s direction.
- b) *Definitions.* The Recipient agrees that for purposes of this section 4(f):
 - i) *Employee* means either an individual who is employed by the Recipient or a Subrecipient, and is participating in a Project or related activities as set forth in the Underlying Agreement, or another person who is participating in a Project or related activities as set forth in the Underlying Agreement and is not compensated by the Recipient, including, but not limited to, a volunteer, or an individual whose services are contributed by the Recipient or Third Party Participant as an in-kind contribution toward the cost sharing requirements of the Recipient’s Underlying Agreement.
 - ii) *Forced labor* means labor obtained by recruitment, harboring, transportation, provision, or other means of obtaining of a person for labor or services through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.
 - iii) *Private entity* means any entity other than a state, local government, Indian tribe, or foreign public entity, as those terms are defined in 2 CFR § 175.25, and includes a for-profit organization, or a nonprofit organization, including any nonprofit organization of higher education, hospital, or tribal organization other than one included in the definition of Indian Tribe at 2 CFR § 175.25(b).
 - iv) *Severe forms of trafficking in persons* has the meaning given at section 103 of the TVPA, as amended, 22 U.S.C. § 7102.
 - v) *Commercial sex act* has the meaning given at section 103 of the TVPA, as amended, 22 U.S.C. § 7102. (vi) (3)
 - vi) *Coercion* has the meaning given at section 103 of the TVPA, as amended, 22 U.S.C. § 7102.
- c) *Provisions Applicable to All Recipients.* The Recipient agrees to, and assures that its Subrecipients will:
 - i. *Provide Information.* Inform FTA immediately of any information it receives from any source alleging a violation of the prohibitions listed in section 4(f)(4) of this Master Agreement; and
 - ii. *Subagreement Provision.* Include the following provision in any subagreement it enters into with a private entity as defined above in section 4(f)(2)(iii) of this Master Agreement:

XXX agrees that it and its employees that participate in the Recipient’s Award, may not:

Engage in severe forms of trafficking in persons during the period of time that the Recipient's Award is in effect,
Procure a commercial sex act during the period of time that the Recipient's Award is in effect, or
Use forced labor in the performance of the Recipient's Award or subagreements thereunder.

- 4) *Provisions Applicable to a Private Entity Recipient.* If the Recipient is a private entity, it agrees that:
- i. *Prohibitions.* It, its employees, its Subrecipients, and its Subrecipients' employees that participate in the Underlying Agreement will not:
 - A. Engage in severe forms of trafficking in persons during the period of time that the Recipient's Underlying Agreement is in effect;
 - B. Procure a commercial sex act during the period of time that the Recipient's Underlying Agreement is in effect; or
 - C. Use forced labor in the performance of the Recipient's Underlying Agreement or subagreements.
 - ii. *Termination of Federal Assistance.* Section 106(g) of the TVPA, as amended, 22 U.S.C. § 7104(g), and U.S. OMB regulatory guidance, "Award Term for Trafficking in Persons," 2 CFR Part 175, provide FTA the right to unilaterally terminate the Underlying Agreement for a violation of that Act without penalty to the Federal Government, if FTA determines that the private entity Recipient or its Subrecipient:
 - (A) Has violated a prohibition described above in section 4(g)(4)(i) of this Master Agreement; or
 - (B) Has an employee whose conduct is determined to have violated a prohibition described above in section 4(g)(4)(i) of this Master Agreement because that employee's conduct is either:
 - a. Associated with the performance of the Recipient's Underlying Agreement; or
 - b. Imputed to the Recipient or Subrecipient using the standards of due process for conduct of an individual to an organization provided in:
 - i) U.S. DOT regulations, "Nonprocurement Suspension and Debarment," 2 CFR Part 1200; or
 - ii) U.S. OMB regulatory guidance, "Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement)," 2 CFR Part 180.
- 5) *Provisions Applicable to a Recipient That is Not a Private Entity.* A Recipient that is not a private entity agrees that section 106(g) of the TVPA, as amended, 22 U.S.C. § 7104(g), and U.S. OMB regulatory guidance, "Award Term for Trafficking in Persons," 2 CFR Part 175, provides FTA the right to unilaterally terminate the Underlying Agreement, without penalty to the Federal Government, for a violation of that Act if FTA determines that:

- (i) A private entity that is the Subrecipient of the Recipient is determined to have engaged in severe forms of trafficking in persons during the period of time that the Recipient's Underlying Agreement is in effect; procured a commercial sex act during the period of time that the Recipient's Underlying Agreement is in effect; or used forced labor in 24 the performance of the Recipient's Underlying Agreement or subagreements thereunder; or
 - (ii) An employee of a private entity that is the Subrecipient has engaged in severe forms of trafficking in persons during the period of time that the Recipient's Underlying Agreement is in effect; procured a commercial sex act during the period of time that the Recipient's Underlying Agreement is in effect; or used forced labor in the performance of the Recipient's Underlying Agreement or subagreements thereunder, and whose conduct described above is associated with the performance of the Recipient's Underlying Agreement; or is imputed to the Subrecipient using the standards for due process to impute the conduct of an individual to an organization as provided in U.S. OMB regulatory guidance, "Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement)," 2 CFR Part 180, and U.S. DOT regulations, "Nonprocurement Suspension and Debarment," 2 CFR Part 1200.
- 6) *Remedies Other Than Termination of Federal Assistance.* The Recipient agrees that FTA's right to terminate federal assistance as provided in the TVPA and in sections 4(f)(4)(ii) and 4(f)(5) are in addition to all other remedies for noncompliance available to the Federal Government under this Master Agreement.

23. False or Fraudulent Statements and Claims

(1) The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. §3801 et seq. and U.S. DOT regulations, "Program Fraud Civil Remedies," 49 C.F.R. Part 31, apply to its activities in connection with this Project. Accordingly, by executing the Grant Agreement or Cooperative Agreement, the Recipient certifies or affirms the truthfulness and accuracy of each statement it has made, it makes, or it may make in connection with the Project covered by the Grant Agreement or Cooperative Agreement. In addition to other penalties that may apply, the Recipient also acknowledges that if it makes a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986, as amended, on the Contractor to the extent the Federal Government deems appropriate.

(2) The Contractor also acknowledges that if it makes a false, fictitious, or fraudulent claim, statement, submission, certification, or agreement with or to the Federal Government involving a project authorized by 49 U.S.C. chapter 53 or any other Federal statute, the Federal Government reserves the right to impose on the Recipient the penalties of 18 U.S.C. § 1001 or other applicable Federal statute to the extent the Federal Government deems appropriate.

(3) The Contractor agrees to include the above two clauses in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the subcontractor who will be subject to the provisions.

24. Access to Records and Reports

The Contractor agrees to permit, and require its subcontractors to permit, the U.S. Secretary of Transportation, and the Comptroller General of the United States, and, to the extent appropriate, the State, or their authorized representatives, upon their request to inspect all Project work, materials, payrolls, and other data, and to audit the books, records, and accounts of the Contractor and its subcontractors pertaining to the Project, as required by 49 U.S.C. § 5325(g).

Contractor also agrees, pursuant to 49 C.F.R. 633.17 to provide the FTA Administrator or his authorized representatives including any PMO Contractor access to Contractor's records and construction sites pertaining to a major capital project, defined at 49 U.S. D. 5302(a)1, which is receiving federal financial assistance through the programs described at 49 U.S.C. 5303, 5307, 5309, 5310, 5311, 5316, or 5317.

The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

The Contractor agrees to maintain all books, records, accounts and reports required under this contract for a period of not less than three (3) years after that date of termination or expiration of this contract, except in the event of litigation or settlement of claims arising from the performance of this contract, in which case Contractor agrees to maintain same until the Purchaser, the FTA Administrator, the Comptroller General, or any of their duly authorized representatives have disposed of all such litigation, appeals, claims or exceptions related thereto. Reference 49 C.F.R. 18.39 (i)(11).

The State of North Carolina, Office of the State Auditor, now requires that all records now be retained for five (5) years after that date of termination or expiration of this contract, except in the event of litigation or settlement of claims arising from the performance of this contract, in which case Contractor agrees to maintain same until the Purchaser, the FTA Administrator, the Comptroller General, or any of their duly authorized representatives have disposed of all such litigation, appeals, claims or exceptions related thereto.

25. Contract Work Hours and Safety Standards Act

Contract Work Hours and Safety Standards Act, as amended, 40 U.S.C. §§ 3701 *et seq.*, specifically, the wage and hour requirements of section 102 of that Act at 40 U.S.C. § 3702, and implementing U.S. DOL regulations, "Labor Standards Provisions Applicable to Contracts Governing Federally Financed and Assisted Construction (also Labor Standards Provisions Applicable to Nonconstruction Contracts Subject to the Contract Work Hours and Safety Standards Act)," 29 C.F.R. Part 5; and the safety requirements of section 107 of that Act at 40 U.S.C. § 3704, and implementing U.S. DOL regulations, "Safety and Health Regulations for Construction," 29 C.F.R. Part 1926.

Pursuant to Section 102 (Overtime):

(These clauses are specifically mandated under DOL regulation 29 C.F.R. §5.5 and when preparing a construction contract in excess of \$2,000 these clauses should be used in conjunction with the Davis-Bacon Act clauses as discussed previously.)

(1) Overtime requirements - No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless

such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages - In the event of any violation of the clause set forth in paragraph (1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of \$ 10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.

(3) Withholding for unpaid wages and liquidated damages - The Owner/grantee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

(4) Subcontracts - The contractor or subcontractor shall insert in any subcontracts the clauses set forth in this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in this section.

(5) Payrolls and basic records - (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

Section 107 (OSHA):

Contract Work Hours and Safety Standards Act - (i) The Contractor agrees to comply with section 107 of the Contract Work Hours and Safety Standards Act, 40 U.S.C. section 3704, and applicable DOL regulations, "Safety and Health Regulations for Construction " 29 C.F.R. Part 1926. Among other things, the Contractor agrees that it will not require any laborer or mechanic to work in unsanitary, hazardous, or dangerous surroundings or working conditions.

(ii) Subcontracts - The Contractor also agrees to include the requirements of this section in each subcontract. The term "subcontract" under this section is considered to refer to a person who agrees to perform any part of the labor or material requirements of a contract for construction, alteration or repair. A person who undertakes to perform a portion of a contract involving the furnishing of supplies or materials will be considered a "subcontractor" under this section if the work in question involves the performance of construction work and is to be performed: (1) directly on or near the construction site, or (2) by the employer for the specific project on a customized basis. Thus, a supplier of materials which will become an integral part of the construction is a "subcontractor" if the supplier fabricates or assembles the goods or materials in question specifically for the construction project and the work involved may be said to be construction activity. If the goods or materials in question are ordinarily sold to other customers from regular inventory, the supplier is not a "subcontractor." The requirements of this section do not apply to contracts or subcontracts for the purchase of supplies or materials or articles normally available on the open market.

26. Project Labor Agreements (formerly Neutrality in Labor Relations)

As a condition of contract award, the Owner may require a third party contractor or subcontractor to have an affiliation with a labor organization such as a project labor agreement, consistent with Executive Order No. 13502, "Use of Project Labor Agreements [PLA] for Federal Construction Projects," February 6, 2009, 41 U.S.C. ch. 39, Refs & Annos., except as the Federal Government determines otherwise in writing.

27. Privacy

To the extent that the Contractor, or its subcontractors, if any, or any to their respective employees administer any system of records on behalf of the Federal Government, the Contractor agrees to comply with, and assure the compliance of its subcontractors, if any, with the information restrictions and other applicable requirements of the Privacy Act of 1974, as amended, 5 U.S.C. Sect. 552, (the Privacy Act).

The Contractor shall obtain the express consent of the Department and the Federal Government before the Contractor, and any subcontractors, or any of their respective employees operate a system of records on behalf of the Federal Government. Failure to do so may result in termination of the Contract and civil and criminal penalties for violation of the Privacy Act.

The Contractor also agrees to include these requirements in each subcontract to administer any system of records on behalf of the Federal Government financed in whole or in part with Federal assistance provided by FTA.

28. National Intelligent Transportation Systems Architecture and Standards

To the extent applicable, the Contractor agrees to conform to the National Intelligent Transportation Systems (ITS) Architecture and Standards requirements of 23 U.S.C. § 517(d), as amended by MAP-21, and follow the provisions of FTA Notice, "FTA National ITS Architecture Policy on Transit Projects," 66 *Fed. Reg.* 1455 *et seq.*, January 8, 2001,

and any other implementing directives FTA may issue at a later date, except to the extent FTA determines otherwise in writing. (*applicable to ITS projects*)

29. **Recycled Products**

The Recycled Products requirement applies to all contracts for items designated by the EPA, when the purchaser or contractor procures \$10,000 or more of one of these items during the fiscal year, or has procured \$10,000 or more of such items in the previous fiscal year, using Federal funds. New requirements for "recovered materials" will become effective May 1, 1996. These regulations apply to all procurement actions involving items designated by the EPA, where the procuring agency purchases \$10,000 or more of one of these items in a fiscal year, or when the cost of such items purchased during the previous fiscal year was \$10,000. These requirements flow down to all contractor and subcontractor tiers.

To the extent possible the contractor agrees to comply with U. S. Environmental Protection Agency (U.S. EPA), "Comprehensive Procurement Guidelines for Products Containing Recovered Materials," 40 CFR Part 247, which implements section 6002 of the Resource Conservation and Recovery Act (RCRA), as amended, 42 U.S.C. 6962. The contractor agrees to provide competitive preference for products and services that conserve natural resources, protect the environment and are energy efficient, except to the extent that the Federal Government determines otherwise in writing. These items include, but may not be limited too:

Paper and paper products, excluding building and construction paper grades.

Construction products:

- (a) Building insulation products, including the following items:
 - (1) Loose-fill insulation, including but not limited to cellulose fiber, mineral fibers (fiberglass and rock wool), vermiculite, and perlite;
 - (2) Blanket and batt insulation, including but not limited to mineral fibers (fiberglass and rock wool);
 - (3) Board (sheathing, roof decking, wall panel) insulation, including but not limited to structural fiberboard and laminated paperboard products, perlite composite board, polyurethane, polyisocyanurate, polystyrene, phenolics, and composites; and
 - (4) Spray-in-place insulation, including but not limited to foam-in- place polyurethane and polyisocyanurate, and spray-on cellulose.
- (b) Structural fiberboard and laminated paperboard products for applications other than building insulation, including building board, sheathing, shingle backer, sound deadening board, roof insulating board, insulating wallboard, acoustical and non-acoustical ceiling tile, acoustical and non-acoustical lay-in panels, floor underlayments, and roof overlay (coverboard).
- (c) Cement and concrete, including concrete products such as pipe and block containing:
 - (1) Coal fly ash;
 - (2) Ground granulated blast furnace slag (GGBF);
 - (3) Cenospheres; or
 - (4) Silica fume from silicon and ferrosilicon metal production.
- (d) Carpet made from polyester fiber made from recovered materials for use in moderate-wear applications such as single-family housing and similar wear applications.
- (e) Floor tiles and patio blocks containing recovered rubber or plastic.
- (f) Shower and restroom dividers/partitions containing recovered plastic or steel.
- (g) (1) Consolidated latex paint used for covering graffiti; and

- (2) Reprocessed latex paint used for interior and exterior architectural applications such as wallboard, ceilings, and trim; gutter boards; and concrete, stucco, masonry, wood, and metal surfaces.
- (h) Carpet cushion made from bonded polyurethane, jute, synthetic fibers, or rubber containing recovered materials.
- (i) Flowable fill containing coal fly ash and/or ferrous foundry sands.
- (j) Railroad grade crossing surfaces made from cement and concrete containing fly ash, recovered rubber, recovered steel, recovered wood, or recovered plastic.
- (k) Modular threshold ramps containing recovered steel, rubber, or aluminum.
- (l) Nonpressure pipe containing recovered steel, plastic, or cement.
- (m) Roofing materials containing recovered steel, aluminum, fiber, rubber, plastic or plastic composites, or cement.

Transportation products:

- (a) Traffic barricades and traffic cones used in controlling or restricting vehicular traffic.
- (b) Parking stops made from concrete or containing recovered plastic or rubber.
- (c) Channelizers containing recovered plastic or rubber.
- (d) Delineators containing recovered plastic, rubber, or steel.
- (e) Flexible delineators containing recovered plastic.

Miscellaneous products:

- (a) Pallets containing recovered wood, plastic, or paperboard.
- (b) Sorbents containing recovered materials for use in oil and solvent clean-ups and as animal bedding.
- (c) Industrial drums containing recovered steel, plastic, or paper.
- (d) Awards and plaques containing recovered glass, wood, paper, or plastic.
- (e) Mats containing recovered rubber and/or plastic.
- (f) (1) Non-road signs containing recovered plastic or aluminum and road signs containing recovered aluminum.
- (2) Sign supports and posts containing recovered plastic or steel.
- (g) Manual-grade strapping containing recovered steel or plastic.
- (h) Bike racks containing recovered steel or plastic.
- (i) Blasting grit containing recovered steel, coal and metal slag, bottom ash, glass, plastic, fused alumina oxide, or walnut shells.

Park and recreation products:

- (a) Playground surfaces and running tracks containing recovered rubber or plastic.
- (b) Plastic fencing containing recovered plastic for use in controlling snow or sand drifting and as a warning/safety barrier in construction or other applications.
- (c) Park benches and picnic tables containing recovered steel, aluminum, plastic, or concrete.
- (d) Playground equipment containing recovered plastic, steel, or aluminum.

Landscaping products:

- (a) Hydraulic mulch products containing recovered paper or recovered wood used for hydroseeding and as an over-spray for straw mulch in landscaping, erosion control, and soil reclamation.
- (b) Compost made from yard trimmings, leaves, grass clippings, and/ or food waste for use in landscaping, seeding of grass or other plants on roadsides and embankments, as a nutritious mulch under trees and shrubs, and in erosion control and soil reclamation.
- (c) Garden and soaker hoses containing recovered plastic or rubber.
- (d) Lawn and garden edging containing recovered plastic or rubber.
- (e) Plastic lumber landscaping timbers and posts containing recovered materials.

Non-paper office products:

- (a) Office recycling containers and office waste receptacles.
- (b) Plastic desktop accessories.
- (c) Toner cartridges.

- (d) Plastic-covered binders containing recovered plastic; chipboard and pressboard binders containing recovered paper; and solid plastic binders containing recovered plastic.
- (e) Plastic trash bags.
- (f) Printer ribbons.
- (g) Plastic envelopes.
- (h) Plastic clipboards containing recovered plastic.
- (i) Plastic file folders containing recovered plastic.
- (j) Plastic clip portfolios containing recovered plastic.
- (k) Plastic presentation folders containing recovered plastic.
- (l) Office furniture containing recovered steel, aluminum, wood, agricultural fiber, or plastic.

30. State and Local Disclaimer

The use of many of the suggested clauses are not governed by Federal law, but are significantly affected by State law. The language of the suggested clauses may need to be modified depending on state law, and that before the suggested clauses are used in the grantees procurement documents, the grantees should consult with their local attorney.

31. Incorporation of Federal Transit Administration (FTA) Terms

The preceding provisions include, in part, certain Standard Terms and Conditions required by DOT, whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by DOT, as set forth in FTA Circular 4220 (as amended), are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Agreement. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any (name of grantee) requests which would cause (name of grantee) to be in violation of the FTA terms and conditions.

32. Hold Harmless

Except as prohibited or otherwise limited by State law, the Contractor agrees to indemnify, save, and hold harmless the Purchaser/Owner of this Purchase Contract and its officers, agents, and employees acting within the scope of their official duties against any liability, including all claims, losses, costs and expenses accruing or resulting to any other person, firm, or corporation furnishing or supplying work, services, materials, or supplies in connection with the performance of this contract, and from any and all claims and losses accruing or resulting to any person, firm, or corporation that may be injured or damaged by the contractor or subcontractor in the performance of this contract and that are attributable to the negligence or intentionally tortuous acts of the contractor.

The Contractor represents and warrants that it shall make no claim of any kind or nature against the Purchaser or it's agents who are involved in the delivery or processing of contractor goods to the Purchaser. The representation and warranty in the preceding sentence shall survive the termination or expiration of this contract.

33. Safe Operation of Motor Vehicles

a. Seat Belt Use.

Pursuant to Executive Order No. 13043, April 16, 1997, 23 U. S. C. § 402, the Contractor is encouraged to adopt and promote on-the-job seat belt use policies and programs for its employees and other personnel that operate company-owned, rented, or personally-operated vehicles and include this provision in any third party subcontracts, leases or similar documents in connection with this project.

b. Distracted Driving, Including Texting While Driving.

Consistent with Executive Order No. 13513, "Federal Leadership on Reducing Text Messaging While Driving," October 1, 2009, 23 U.S.C. Section 402 note, and DOT Order 3902.10, "Text Messaging While Driving," December 30, 2009, FTA encourages each third party contractor to promote policies and initiatives for its employees and other personnel that adopt and promote safety policies to decrease crashes by distracted drivers, including policies to ban text messaging while driving, and to include this provision in any third party subcontract leases or similar documents in connection with this project.

c. Safety. The Contractor is encouraged to:

- (a) Adopt and enforce workplace safety policies to decrease crashes caused by distracted drivers including policies to ban text messaging while driving—

Company-owned or rented vehicles; Privately-owned vehicles when on official Project related business or when performing any work for or on behalf of the Project; or any vehicle, on or off duty, and using an electronic device.

- (b) Education, awareness, and other outreach to employees about the safety risks associated with texting while driving.

d. Definitions

- (1) "Driving" means operating a motor vehicle on a roadway, including while temporarily stationary because of traffic, a traffic light, stop sign, or otherwise. "Driving" does not include being in your vehicle (with or without the motor running) in a location off the roadway where it is safe and legal to remain stationary.
- (2) "Text Messaging" means reading from or entering data into any handheld or other electronic device, including for the purpose of short message service texting, e-mailing, instant messaging, obtaining navigational information, or engaging in any other form of electronic data retrieval or electronic data communication. The term does not include the use of a cell phone or other electronic device for the limited purpose of entering a telephone number to make an outgoing call or answer an incoming call, unless the practice is prohibited by State or local law.

34. Metric System

To the extent required by U.S. DOT or FTA, the Contractor agrees to use the metric system of measurement in its Contract activities as may be required by 49 U.S.C. Sect. 205a et seq.; Executive Order No. 12770, "Metric Usage in Federal Government

Programs," 15 U.S.C. Sect. 205a; and other regulations, guidelines and policies issued by U.S. DOT or FTA. To the extent practicable and feasible, the Contractor agrees to accept products and services with dimensions expressed in the metric system of measurement.

35. Geographic Information and Related Spatial Data.

In accordance with U.S. OMB Circular A-16, "Coordination of Geographic Information and Related Spatial Data Activities," August 19, 2002, and OMB Circular A-16, Supplemental Guidance "Geospatial Line of Business," November 10, 2010, the Contractor agrees to implement this Project so that any activities involving spatial data and geographic information systems activities financed directly or indirectly, in whole or in part, by Federal assistance, are consistent with the National Spatial Data Infrastructure promulgated by the Federal Geographic Data Committee, except to the extent that FTA determines otherwise in writing.

36. Exclusionary or Discriminatory Specifications

The Contractor agrees that it will comply with the requirements of 49 U.S.C. Sect. 5325(h) by refraining from using any funds derived from FTA in performance of this Contract to support procurements using exclusionary or discriminatory specifications.

37. Sensitive Security Information

Each third party contractor must protect, and take measures to ensure that its subcontractors at each tier protect, "sensitive security information" made available during the administration of a third party contract or subcontract to ensure compliance with "The Homeland Security Act", as amended, specifically 49 U.S.C. Section 40119(b), The Aviation and Transportation Security Act, as amended, 49 U.S.C. § 114(r), U.S. DOT regulations, "Protection of Sensitive Security Information," 49 C.F.R. part 15, and U.S. Department of Homeland Security, Transportation Security Administration regulations, "Protection of Sensitive Security Information," 49 C.F.R. part 1520.

38. Geographic Preference

Procurements shall be conducted in a manner that prohibits the use of statutorily or administratively imposed in-State or local geographical preferences in evaluation or award of bids or proposals, except where applicable Federal statutes expressly mandate or encourage geographic preference. This does not preempt State licensing laws.

39. NC E-Verify Requirements

To ensure compliance with the E-Verify requirements of the General Statutes of North Carolina, all contractors, including any subcontractors employed by the contractor(s), by submitting a bid, proposal or any other response, that involve a combination of purchase of any material, equipment, supplies and construction or service must attest and affirm that they are aware and in full compliance with Article 2 of Chapter 64, (NCGS64-26(a)) relating to the E-Verify requirements by executing and submitting the E-verify Affidavit included in this Invitation for Bids as Attachment E. ***(Must be completed for all construction contracts and all bids or quotes requiring service or installation.)***

40. Prohibition on Certain Telecommunications and Video Surveillance Equipment or Services

To the extent required by 2 CFR part 200, recipients and subrecipients are prohibited from obligating or expending loan or grant funds to:

- 1) Procure or obtain covered telecommunications equipment or services;
- 2) Extend or renew a contract to procure or obtain covered telecommunications equipment or services; or
- 3) Enter into a contract (or extend or renew a contract) to procure or obtain covered telecommunications equipment or services.

As described in section 889 of Public Law 115-232, “covered telecommunications equipment or services” means any of the following:

- 1) Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities);
- 2) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities);
- 3) Telecommunications or video surveillance services provided by such entities or using such equipment;
- 4) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country;

For the purposes of this section, “covered telecommunications equipment or services” also include systems that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.

In implementing the prohibition under section 889 of [Public Law 115-232](#), heads of executive agencies administering loan, grant, or subsidy programs must prioritize available funding and technical support to assist affected businesses, institutions, and organizations as is reasonably necessary for those affected entities to transition from covered telecommunications equipment or services, to procure replacement equipment or services, and to ensure that communications service to users and customers is sustained.

When the recipient or subrecipient accepts a loan or grant, it is certifying that it will comply with the prohibition on covered telecommunications equipment and services in this section. The recipient or subrecipient is not required to certify that funds will not be expended on covered telecommunications equipment or services beyond the certification provided upon accepting the loan or grant and those provided upon submitting payment requests and financial reports.

41. Domestic Preference for Procurements

Pursuant to 2 CFR part 200, the recipient or subrecipient should, to the greatest extent practicable and consistent with law, provide a preference for the purchase, acquisition,

or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards, contracts, and purchase orders under Federal awards.

For purposes of the section:

- 1) "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
- 2) "Manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

Federal agencies providing Federal financial assistance for infrastructure projects must implement the Buy America preferences set forth in 2 CFR part 184.

42. Solid Waste Disposal

Pursuant to 2 CFR 184, 2 CFR 200.322 and 2 CFR Appendix II, a recipient that is a state agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

43. Rights to Inventions

Pursuant to 37 CFR part 401.14 and 2 CFR part 200 Appendix II, if the federal award meets the definition "funding agreement" under 37 C.F.R. § 401.2(a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or subrecipient must comply with the requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

44. Prompt Payment and Return of Retainage

Pursuant to 49 CFR part 26.29, a prime contractor is required to pay subcontractors for satisfactory performance of their contracts no later than 30 days from receipt of each payment made to the prime contractor. In addition, the prime contractor is required to provide prompt and full payment of retainage to the subcontractor within 30 days after the subcontractor's work is satisfactorily completed.

A subcontractor's work is satisfactorily completed when all the tasks called for in the subcontract have been accomplished and documented as required by the recipient. When a recipient has made an incremental acceptance of a portion of a prime contract, the work of a subcontractor covered by that acceptance is deemed to be satisfactorily completed.

Prompt payment and return of retainage requirements in this part also apply to all lower-tier subcontractors.

ATTACHMENT A

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY and VOLUNTARY EXCLUSION LOWER TIER COVERED TRANSACTION

(To be submitted with all bids exceeding \$25,000.)

- (1) The prospective lower tier participant (Bidder/Contractor) certifies, by submission of this bid or proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) The prospective Bidder/Contractor also certifies by submission of this bid or proposal that all subcontractors and suppliers (this requirement flows down to all subcontracts at all levels) are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (3) Where the prospective lower tier participant (Bidder/Contractor) is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this bid or proposal.

The lower tier participant (Bidder/Contractor), _____, certifies or affirms the truthfulness and accuracy of this statement of its certification and disclosure, if any.

DATE _____

SIGNATURE _____

COMPANY _____

NAME _____

TITLE _____

State of _____

County of _____

Subscribed and sworn to before me this ____ day of _____, 20____.

Notary Public _____

My Appointment Expires _____

ATTACHMENT B

STATE OF NORTH CAROLINA
COUNTY OF WAKE

AFFIDAVIT OF COMPLIANCE WITH N.C. E-VERIFY STATUTES

(To be submitted with all bids)

I, _____ (hereinafter the "Affiant"), duly authorized by and on behalf of _____ (hereinafter the "Employer") after being first duly sworn deposes and says as follows:

1. I am the _____ (President, Manager, CEO, etc.) of the Employer and possess the full authority to speak for and on behalf of the Employer identified above.
2. Employer understands that "E-Verify" means the federal E-Verify program operated by the United States Dept. of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law.
3. ☐ Employer employs 25 or more employees, and is in compliance with the provisions of N.C. General Statute §64-26. Employer has verified the work authorization of its employees through E-Verify and shall retain the records of verification for a period of at least one year.

☐ Employer employs fewer than 25 Employees and is therefore not subject to the provisions of N.C. General Statute §64-26.
4. All subcontractors engaged by or to be engaged by Employer have or will have likewise complied with the provisions of N.C. General Statute §64-26.
5. Employer shall keep the State of North Carolina informed of any change in its status pursuant to Article 2 of Chapter 64 of the North Carolina Statutes.

This ____ day of _____, 20____.

Signature of Affiant

Printed Name and Title

State of _____

County of _____

Subscribed and sworn to before me this ____ day of _____, 20____.

Notary Public _____

(SEAL)

My Appointment Expires _____

ATTACHMENT C

CERTIFICATION OF COMPLIANCE WITH DAVIS– BACON PROVISIONS

PROJECT: _____
(List name of construction project/repair)

LOCATION: _____ NC COUNTY: _____
(City)

CONTRACTOR/SUBCONTRACTOR: _____

In accordance with the requirements of the Davis-Bacon Act, all laborers and mechanics employed by contractors and subcontractors on projects funded directly by or assisted in whole or in part by and through the Federal Government are being paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by the Secretary of Labor in accordance with subchapter IV of Chapter 31 of title 40, United States Code.

In addition, the owner/representative must conduct adequate oversight for compliance with Davis-Bacon and related Acts through (a) the review of payrolls and associated certifications, (b) conducting of employee interviews if necessary, and (c) the posting of the Davis-Bacon Poster, all wage determinations, and additional classifications (as appropriate) on the work site.

The Contractor/Subcontractor, _____, certifies or affirms the truthfulness and accuracy of the above statement and that the referenced project will be in compliance with the Davis-Bacon requirements.

Date

Signature of Contractor's Authorized Official

Name and Title of Contractor's Authorized Official

Subscribed and sworn to before me this ____ day of _____, 20__, in the State of _____;
and the County of _____.

Notary Public _____

My Appointment Expires _____

BIDDER SAFETY EVALUATION QUESTIONNAIRE

CONTRACTOR SAFETY RECORD INFORMATION

The Contractor's safety record shall be reviewed and evaluated in addition to other quality and performance criteria as part of bid evaluation process. Failure to provide the requested information and documentation may result in rejection of your bid as non-responsive. Accordingly, all bidders must submit the following information regarding their safety record.

The following definitions shall apply to this section:

"OSHA" – Acronym for the Federal Occupational Health and Safety Administration. The term "OSHA" as used in this Policy also refers to any state or local agency having jurisdictional authorization to enforce worker safety requirements and assess fines or warnings for violation of worker safety standards.

1. Answer the following OSHA Specific Questions:

- (a) Within the last 2 years, has the bidder received any citations classified by OSHA as being (1) serious, (2) willful and/or (3) repeat violations where your company operates?

Yes _____ No _____

(If yes, attach a copy of each such citation and include violation description.)

- (b) Has the bidder experienced any major work-related injuries or work-related fatalities within the last five (5) years?

Yes _____ No _____

- (c) Has the bidder had any citations issued by OSHA as a result of work related injuries or fatalities within the past five (5) years?

Yes _____ No _____

- (d) Is the bidder under investigation for any work-related injuries or fatalities?

Yes _____ No _____

- (e) If your answer is "yes" to 1(b), (c) or (d), provide a copy of the citation(s), list of number(s) of serious injuries and/or fatalities and documented explanation of the incident(s) and injuries/fatalities.

2. Safety Plan:

- (a) Does the company have a written comprehensive safety program that includes and indicates responsibility for all aspects of safety management (i.e. overall company policy and individual responsibilities, site inspections, first aid, fall protection, injury and illness prevention, fleet safety, Personal Protective Equipment (PPE), aerial lift, fire protection procedures etc.)?

Yes _____ No _____

- (b) Does the company have a written plan for safety training of new employees and ongoing training of existing personnel and supervisors?

Yes _____ No _____

- (c) Are all trades and laborers made aware of, receive instruction and regularly updated on safety compliance, best practices and operational requirements to ensure safe conditions are maintained on the job site?

Yes _____ No _____

- (d) Does the company have documented evidence of safety training that they have conducted?

Yes _____ No _____

- (e) Does the company have and maintain documented safety plan information?

Yes _____ No _____

- (f) Is there a specific safety plan implemented for each project including pre-job safety inspections, measures for corrective actions and means for documenting and correcting unsafe conditions?

Yes _____ No _____

- (g) Does the company hold regular safety meetings for employees and subcontractors at each job site throughout duration of project construction?

Yes _____ No _____

- (h) Does the company provide notice at the job site that indicates to all staff where safety equipment is available onsite and clearly indicates the locations of safety equipment storage locations?

Yes _____ No _____

- (i) Do all supervisors have an appropriate documented level of OSHA training (e.g., a minimum of 30-hour OSHA construction safety training)?

Yes_____No _____

- (j) Do employees have documented basic OSHA 10-hour construction safety training?

Yes_____No _____

- (k) Does the company have a documented Hazard Communication Program?

Yes_____No _____

3. Storm and Inclement Weather Safety Planning:

- (a) Does the company have a written Storm Hazard Awareness and Preparedness Plan and site monitoring/notification means to provide proper safety measures at the project site in the event of inclement or extreme weather? (i.e. site evacuation procedures, damage protection, securement of equipment and materials, removal of debris and scrap materials, protection of incomplete underground storm drain system against sand and silt infiltration etc.)?

Yes_____No _____

4. Required Written Explanation of Safety Record. If the bidder has any of the following:

- (a) answered "yes" to any of the OSHA Specific Question above, or
(b) answered "no" to any of the Safety Plan or Storm Safety questions,

the bidder shall then provide the City, in its bid, a detailed written explanation of its safety record and the reasons why such safety history is NOT representative of its future performance and an explanation of what specific actions it has taken to improve its overall safety record. Failure to provide a written explanation of its safety record pursuant to this paragraph may deem a bidder as non-responsive by the City.

END OF SAFETY EVALUATION QUESTIONNAIRE

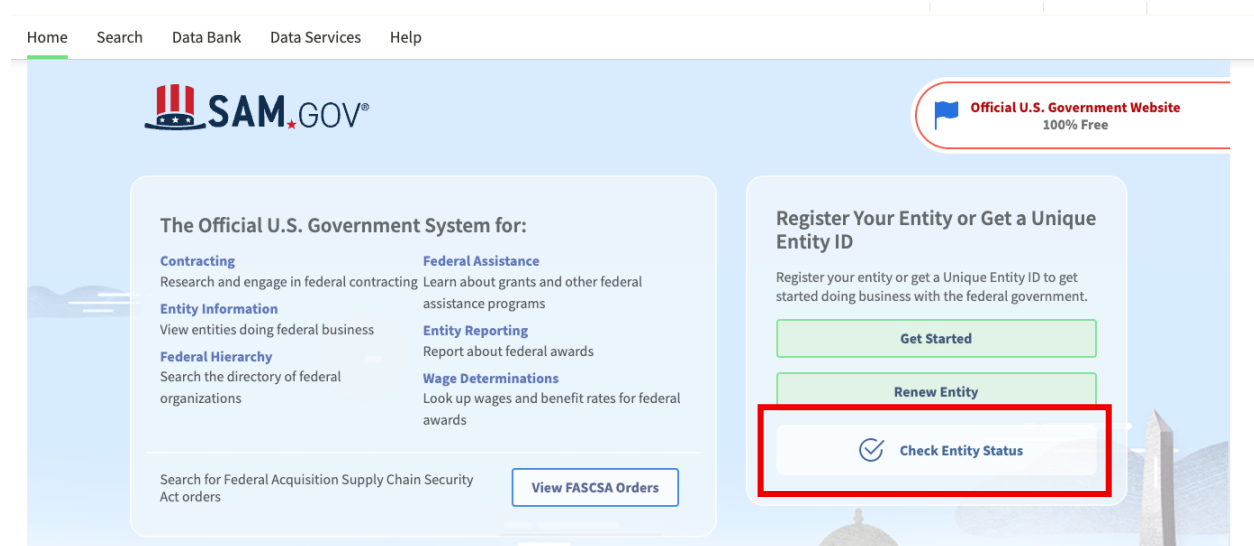
SAM.gov Registration

A System for Award Management (SAM) account is a free, official U.S. government registration on SAM.gov that allows organizations to apply for grants, compete for federal contracts, and manage their entity information. Maintaining an active SAM registration and updating annually is essential for conducting business with federal agencies or pursuing projects funded with federal dollars.

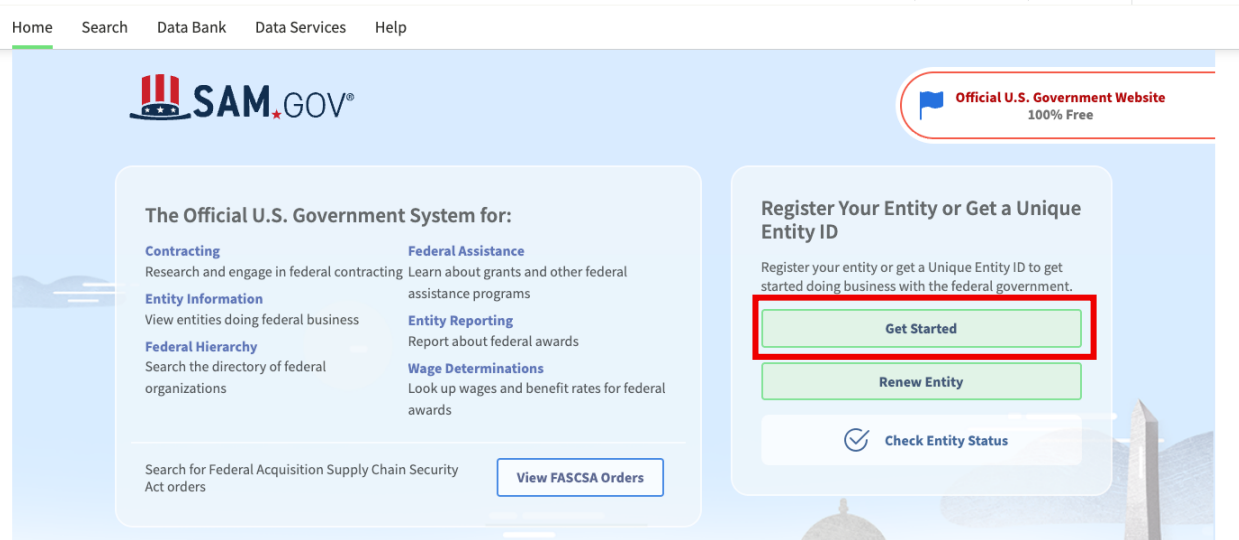
How to check for a SAM registration:

1. Go to the SAM.gov website.
2. Either check an existing entity status by clicking the “Check Entity Status” (see below).

Note: The Unique Entity ID does not expire; however, registrations must be updated and renewed each year to remain in the “active registration” status. If a company fails to update or renew their registration, it will be in an “inactive” status, but the entity will still have its same Unique Entity ID. No awards or payments can be processed while the registration is in “inactive” status.



3. Create a FREE registration.



4. Additional instructions along with FAQs are included to help provide guidance on how to get a Unique Entity ID and complete a registration (see below).

Note: Some entities who do business with the government may choose not to fully register in SAM.gov. For example, sub-awardee. In this case, those entities cannot bid directly on federal contractors as a prime contractor or see federal assistance as a prime awardee. If this is the goal of the entity, they can go to SAM.gov and get a Unique Entity ID only.

