WAKE COUNTY

APEX MAIN EMS STATION

6950 APEX BARBECUE ROAD, APEX, NORTH CAROLINA 27502| WAKE COUNTY REQUEST FOR BIDS NUMBER: RFB-23-080

ADDENDUM NO. 2

DATE: OCTOBER 19, 2023

BID DATE, TIME, AND LOCATION HAVE NOT BEEN CHANGED.

REMINDER: THE 00300 – BID PROPOSAL FORM – SINGLE PRIME GENERAL CONSTRUCTION WAS REVISED AND REISSUED IN ADDENDUM NO. 1. PLEASE BE SURE TO USE THE REVISED FORM INCLUDED IN ADDENDUM NO. 1. THE UPDATED FORM INCLUDES A RED 10/17/23 REVISION DATE WITHIN THE DOCUMENT FOOTER TO DISTINGUISH THEM FROM THE PREVIOUSLY PROVIDED (NOW VOID) VERSION.

GENERAL:

This addendum forms a part of the Contract Documents of the above referenced project and modifies the original Contract Documents as described below. Acknowledge receipt of this Addendum in the space provided on the Form of Proposal Signature Page.

This addendum has been distributed to: all Pre-Bid Conference Attendees, all Contractors that requested Bid Documents from Williard Stewart Architects, and to all Plan Rooms / Plan Services listed in the Notice to Bidders.

This addendum has also been uploaded to the same online file-sharing site used by Williard Stewart Architects to distribute digital PDFs of the Bid Documents for this project:

https://www.dropbox.com/scl/fo/fsflzahq95okigqw1pcmp/h?rlkey=oxre74go8d5q6qpgim3nd40ej&dl=0

PROJECT MANUAL:

SECTION 00075 – TABLE OF CONTENTS (VOLUME 1 AND VOLUME 2)

1. Division 26 – Electrical, Specification Section 26 99 99 – Supervisory Control and Data Acquisition Systems Version 1.2: **REVISE** the specification name to read as "26 99 99 – Supervisory Control and Data Acquisition Systems Ethernet" and **REVISE** the page count to read as "1-9".

SECTION 00800 – SUPPLEMENTARY GENERAL CONDITIONS

1. Article 1 – Definitions, Paragraph 1.18, List of Drawings: **REVISE** the date of Drawing Sheet A101 – Floor Plan to be "10/19/23".
2. Article 1 – Definitions, Paragraph 1.18, List of Drawings: **REVISE** the date of Drawing Sheet A701 – Window & Door Schedules & Elevations to be "10/19/23".
3. Article 1 – Definitions, Paragraph 1.18, List of Drawings: **REVISE** the date of Drawing Sheet E102 – Electrical Power New Work Plan to be "10/19/23".
4. Article 1 – Definitions, Paragraph 1.18, List of Drawings: **REVISE** the date of Drawing Sheet E402 – Electrical Details to be "10/19/23".
5. Article 1 – Definitions, Paragraph 1.18, List of Drawings: **REVISE** the date of Drawing Sheet E404 – Electrical Details to be "10/19/23".
6. Article 1 – Definitions, Paragraph 1.18, List of Drawings: **REVISE** the date of Drawing Sheet E406 – Electrical Details to be "10/19/23".
7. Article 1 – Definitions, Paragraph 1.18, List of Drawings: **REVISE** the date of Drawing Sheet E407 – Electrical Details to be "10/19/23".
8. Article 1 – Definitions, Paragraph 1.18, List of Drawings: **REVISE** the date of Drawing Sheet E408 – Electrical Details to be "10/19/23".
9. Article 1 – Definitions, Paragraph 1.18, List of Drawings: **REVISE** the date of Drawing Sheet E501 – Electrical Power Riser to be "10/19/23".
10. Article 1 – Definitions, Paragraph 1.18, List of Drawings: **REVISE** the date of Drawing Sheet E601 – Electrical Details to be "10/19/23".

SECTION 083600 – SECTIONAL OVERHEAD DOORS

1. **DELETE AND REPLACE** Specification Section 083600 – Sectional Overhead Doors with the attached **REVISED** attached Specification Section 083600 – Sectional Overhead Doors (11 Pages, Dated 10/19/23).

SECTION 088000 – GLASS AND GLAZING

1. Part 2, Paragraph 2.2, Subparagraph C: DELETE Subparagraph C and REPLACE it with the following:
   "C. Insulated Glass Units
      1. General: Insulating-Glass Units: Pre-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190 and complying with requirements designated below, indicated on Drawings, or required by building code.
         a. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated or required by code.
         b. Sealing System: Dual seal with manufacturers standard primary and secondary sealants.
         c. Spacer: Manufacturer's standard.
         d. Corner Construction: Manufacturer's standard.
         e. Overall Unit Thickness and Thickness of Each Lite: 25 mm (1") and 6 mm (1/4") Dimensions indicated are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
         f. Interspace Content: Air.
      2. Low-E Insulating Glass
         a. Provide glass complying with requirements designated below, indicated on drawings, or required by building code. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated or required by code.
         b. Interspace Content: Air.
         c. Indoor Lite: Float glass, Class 1 (clear), Annealed, Kind HS (heat strengthened), Condition C (other coated glass), Kind FT (fully tempered), Condition C (other coated glass), Kind HS (heat strengthened), Condition A (uncoated surfaces), Kind FT (fully tempered) Condition A (uncoated surfaces).
         d. Outdoor Lite: Float glass, Class 1 (clear), Annealed, Kind HS (heat strengthened), Condition A (uncoated surfaces), Kind HS (heat strengthened), Condition C (other coated glass), Kind FT (fully tempered), Condition A (uncoated surfaces), Kind FT (fully tempered) Condition C (other coated glass).
         e. Low-Emissivity Coating: Coating on surface No. 2
         f. Winter Nighttime U-Value: Maximum value of .29 unless otherwise noted.
         g. Summer Daytime U-Value: Maximum value of .27 unless otherwise noted.
         h. Summer relative heat gain: 61
         i. Visible Light Transmission: 48% Minimum.
         j. SHGC: .25
         k. Outdoor Visible Light Reflectance: 19%
         l. Direct Solar Energy Transmittance: 21%
         m. Direct Solar Energy Transmittance Outdoors: 40%
         n. Basis of Design: Guardian SunGuard SNE 50/25 UltraClear or equal."
2. Part 2, Paragraph 2.2, Subparagraph D: **DELETE** Subparagraph D – Laminated Glass.

SECTION 096520 – RESILIENT BASE AND ACCESSORIES

1. Part 2, Paragraph 2.1, Subparagraph B, Item 2: **DELETE** Item 2 "B2-Long-Toe Base" and **REPLACE** with "Not Used".

SECTION 096810 – CARPET TILE

1. Part 2, Paragraph 2.1, Subparagraph A, Item 1a: **REVISE** carpet tile Color to be "Granite (7984)"
2. Part 2, Paragraph 2.1, Subparagraph A, Item 1b: **REVISE** carpet tile Style to be "Datum."

3. Part 2, Paragraph 2.1, Subparagraph A, Item 1c: **REVISE** carpet tile Pattern/Collection to be "Bending Earth."
4. Part 2, Paragraph 2.1, Subparagraph C: **REVISE** the Nylon Type to be "ColorStrand SD Nylon".
5. Part 2, Paragraph 2.1, Subparagraph E: **REVISE** the Surface Texture to be "Level Patterned Loop".
6. Part 2, Paragraph 2.1, Subparagraph G: **REVISE** the Stitches to be "11 Stitches Per Inch".
7. Part 2, Paragraph 2.1, Subparagraph I: **REVISE** the Pile Density to be "5040".
8. Part 2, Paragraph 2.1, Subparagraph J: **REVISE** the Face Weight to be "14.40 oz/yd2".
9. Part 2, Paragraph 2.1, Subparagraph K: **REVISE** the Backing System to be "EcoFlex Matrix".
10. Part 2, Paragraph 2.1, Subparagraph N: **REVISE** the Recycled Content Material to be "Pre-Consumer 48%".
11. Part 2, Paragraph 2.1: **ADD** Subparagraph O the reads as follows "O. Foot Traffic Recommendation TARR: Heavy."

SECTION 107500 – FLAGPOLES

1. Part 1, Paragraph 1.2, Subparagraph A: ADD the following items to Subparagraph A:

   "1. Provide flagpoles capable of withstanding the effects of wind loads as determined according to the building code in effect for this Project or NAAMM FP 1001," Guide Specification for Design of Metal Flagpoles" whichever is more stringent."

   2. Base flagpole design on maximum standard-size flag suitable for use with pole or flag size indicated, whichever is more stringent.

   3. Basic Wind Speed: Refer to Structural Drawing S001 – Structural General Notes and Details."
2. Part 2, Paragraph 2.1, Subparagraph A: **ADD** "Flagpole Warehouse" to the list of Manufacturers.
3. Part 2, Paragraph 2.2, Subparagraph A: **ADD** the following items (4-6):

   "4. Construction: Construct flagpoles in one piece if possible. If more than one piece is necessary, comply with the following:

      a. Fabricate shop and field joints without using fasteners, screw collars, or lead caulking.
      b. Provide flush hairline joints using self-aligning, snug-fitting, internal sleeves.

   5. Flashing Collar: Same material and finish as flagpole.
   6. Sleeve for Aluminum Flagpole: Foundation sleeve, made to fit flagpole, for casting into concrete foundation."

4. Part 3, Paragraph 3.1, Subparagraph A: **REVISE** the last sentence of this paragraph to read as "Install flagpole per manufacturer's recommendations and according to shop drawings."
5. Part 3, Paragraph 3.1: **ADD** subparagraph B to read as follows:

   "B. Foundation Tube: Place flagpole in tube, seated on bottom plate between steel centering wedges, and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch (50-mm) layer of elastomeric joint sealant and cover with flashing collar."
6. Part 3, Paragraph 3.1: **ADD** subparagraph C to read as follows:

   "C. Baseplate: Cast anchor bolts in concrete foundation. Install baseplate on washers placed over leveling nuts on anchor bolts and adjust until flagpole is plumb. After flagpole is plumb, tighten retaining nuts and fill space under baseplate solidly with non-shrink, nonmetallic grout. Finish exposed grout surfaces smooth and slope 45 degrees away from edges of baseplate."

SECTION 108000 – COMMERCIAL TOILET ACCESSORIES

1. Part 2, Paragraph 2.02, Subparagraph E, Item 1: **REVISE** the Basis-of-Design Product to read as "ASI 3800 Series."

SECTION 104413 – PORTABLE FIRE EXTINGUISHER CABINETS

1. Part 2, Paragraph 2.02, Subparagraph B: **CLARIFICATION**: Non-Rated fire extinguisher cabinets to be installed in non-rated walls. 1-Hour fire rated fire extinguisher cabinets to be installed in 1-hour rated wall construction. Refer to graphic mark "FE" on G103 and A101 plans for locations of fire extinguishers and associated wall construction.

SECTION 113100 – RESIDENTIAL AND COMMERCIAL APPLIANCES

1. Part 2, Paragraph 2.2, Subparagraph A: **REVISE** the Basis of Design Product to read as "General Electric Company Model JD630STSS".
2. Part 2, Paragraph 2.4, Subparagraph A: **REVISE** the Basis of Design Product to read as "General Electric Company Model PYE22KYNFS".

3. Part 2, Paragraph 2.7, Subparagraph B, Item 2: **REVISE** the Capacity to read as "7.4 Cu. Ft.".

SECTION 23 73 13 – PACKAGED SPLIT-SYSTEM AIR HANDLING UNITS

1. Part 2, Paragraph 2.2: **ADD** Subparagraph I that reads as follows: "I. Provide BACnet interface card in packaged unit controller to allow for future connection to Owner's BAS system."

SECTION 26 83 11 – FIRE ALARM

1. Part 2, Paragraph 2.1, Subparagraph A: **ADD** "SimplexGrinnell" to the list of Fire Alarm System Manufacturers.

SECTION 26 99 99 – SUPERVISORY CONTROL AND DATA ACQUISITION SYSTEMS

2. **DELETE AND REPLACE** Specification Section 269999 – Supervisory Control and Data Acquisition Systems Version 1.2 with the attached **REVISED** attached "Supervisory Control and Data Acquisition Systems Ethernet" (9 Pages, Dated 10/19/23).

DRAWINGS:

SHEET C3.1 – UTILITY PLAN

1. **CLARIFICATION**: All proposed sanitary sewer manholes shall be a standard diameter of 4' per Town of Apex utility standards.
2. **CLARIFCATION**: A 8" gate valve, two total, shall be installed on the existing 8" Ductile Iron waterline on both sides of the tapping sleeve. The tapping sleeve shall include an 8" gate valve for the alignment along Ellerview Drive. This configuration is per Town of Apex utility standards.
3. Sanitary Sewer Inset Plan - 8" Sanitary Sewer Line Manhole MH2 Between Station 3+50 and 4+00: **REVISE** the note pointing at Manhole MH2 from '8" Sanitary Sewer MH2" to read as "Sanitary Sewer Manhole MH2".

SHEET C3.2 – SANITARY SEWER PLAN AND PROFILE (PUBLIC)

1. **CLARIFICATION**: Pipe MH2-EXMH1 ties in the existing manhole structure, EXMH1, at invert 336.61.
2. **CLARIFCATION**: The existing manhole will have an internal drop for incoming pipe, MH2-EXMH1, as the existing outlet invert is 330.48.
3. 8" Sanitary Sewer Line Manhole MH2 Between Station 3+50 and 4+00: **REVISE** the note pointing at Manhole MH2 from '8" Sanitary Sewer MH2" to read as "Sanitary Sewer Manhole MH2".

SHEET C5.1 – NOTES AND DETAILS

1. Detail 3/C5.1 – Flagpole: **CLARIFICATION**: Disregard the graphical representation of a cleat on the Flagpole detail. Flag poles to have internal halyard system with lockable cover. **DELETE** the word "cleat" from the note that reads "Multiple Internal Halyard Cleat with Lockable Cover."

SHEET A101 – FLOOR PLAN

1. **REPLACE** Sheet A101 – Floor Plan with the attached, updated A101 – Floor Plan (Revision 2, Dated 10/19/23). Living 109 / Covered Patio 120 storefront window designation added. Louver L04 position updated to coordinate with location shown on Mechanical Drawing M101.

SHEET A701 – WINDOW & DOOR SCHEDULES & ELEVATIONS

1. **REPLACE** Sheet A701 – Window & Door Schedules & Elevations with the attached, updated A701 – Window & Door Schedules & Elevations (Revision 2, Dated 10/19/23). Exterior Aluminum Storefront Window W05 and Exterior Hollow Metal Door Frame 11 elevations added to G5/A701 Window & Louver Elevations. Door 106B Door Frame Type revised to Exterior Hollow Metal Door Frame 11 on J5/A701 Door Schedule. Kerfed Frame (KF) previously added to Door 113E via text edit in Addendum 1 updated on revised drawing.

SHEET A801 – FINISH & FURNISHING PLAN

1. Finish Legend, Floor, Finish Mark F2 – Carpet Tile: **REVISE** the Basis of Design Manufacturer / Color Selection to read as follows: 'Mohawk Group, "Bending Earth" Collection, Style:"BT284 Datum", Color: "7948 Granite".
2. Finish Legend, Base, Finish Mark B2 – Resilient Base (Long Toe): **DELETE** Item Description and Basis of Design Manufacturer | Color Selection text and **REPLACE** with "NOT USED".
3. Finish Schedule, Room Number 113 – Vehicle Bays: **REVISE** Base Finish Designation to be "B1".

4. Finish Schedule, Room Number 113A – Alcove: **REVISE** Base Finish Designation to be "B1".
5. Finish Schedule, Room Number 115 – PPE: **REVISE** Base Finish Designation to be "B1".
6. Finish Schedule, Room Number 116 – Decon: **REVISE** Base Finish Designation to be "B1".
7. Finish Schedule, Room Number 122 – Mechanical: **REVISE** Base Finish Designation to be "B1".

SHEET M101 – MECHANICAL NEW WORK PLAN

1. Detail 1/M101 – Firs Floor New Work Plan: In Telecom 117, **ADD** Keynote 25 adjacent to the thermostat shown in this room.
2. Keynotes: **ADD** Keynote 25 that reads as follows:

   "25. Provide Schneider SE8650 thermostat adjacent to DMSS-1 thermostat for future connection to Owner's BAS system. SE8650 thermostat will be used for temperature monitoring only, not control of the DMSS."

SHEET M301 – MECHANICAL SCHEDULES

1. **CLARIFICATION**: Refer to Drawing Sheet M001 – Mechanical Legend & Notes for the Ductless Mini-Split Schedule and Air Distribution Schedule.
2. Air Handling Unit Schedule, Mark AHU-1, and Mark AHU-2: **ADD** Note 10 in the Notes column of the Air Handling Unit Schedule. ADD Note 10 to the list of Air Handling Unit Schedule Notes that reads as follows:

   "10. Provide BACnet interface card in packaged unit controller to allow for future connection to Owner's BAS system."

SHEET E001 – ELECTRICAL LEGEND & NOTES

1. Electrical Legend – Combination Voice/Data Outlet Item Description: **REVISE** the Combination Voice/Data Outlet Item Description to read as follows:

   "Data Outlet (See Note #5)
   1-Port Data, 1-Port Data, 1-Spare Port, 1-Spare Port. Two (2) CAT-6 Cables from Each Port to Telecom Rack. Contractor shall field verify and coordinate exact mounting locations and requirements with the Owner."

SHEET E102 – ELECTRICAL POWER NEW WORK PLAN

1. **REPLACE** Sheet E102 – Electrical Power New Work Plan with the attached, updated E102 – Electrical Power New Work Plan (Revision 2, Dated 10/19/23). GFCI and Data Outlet revisions. Additional General and Keynotes added. 1-Hour rated wall graphic representation added to Supervisor 103 rated walls as previously noted in Addendum No. 1.

SHEET E402 – ELECTRICAL DETAILS

1. **REPLACE** Sheet E402 – Electrical Details with the attached, updated E402 – Electrical Details (Revision 2, Dated 10/19/23). Truck Plug Connection Detail updated.

SHEET E404 – ELECTRICAL DETAILS

1. **REPLACE** Sheet E404 – Electrical Details with the attached, updated E404 – Electrical Details (Revision 2, Dated 10/19/23). Service Bonding Detail updated.

SHEET E406 – ELECTRICAL DETAILS

1. **REPLACE** Sheet E406 – Electrical Details with the attached, updated E406 – Electrical Details (Revision 2, Dated 10/19/23). Partial SCADA System Schematic updated. Note added to Generator Detail.

SHEET E407 – ELECTRICAL DETAILS

1. **REPLACE** Sheet E407 – Electrical Details with the attached, updated E407 – Electrical Details (Revision 2, Dated 10/19/23).

SHEET E408 – ELECTRICAL DETAILS

1. **REPLACE** Sheet E408 – Electrical Details with the attached, updated E408 – Electrical Details (Revision 2, Dated 10/19/23). Telecom Equipment Rack Elevation and Typical Telecom Faceplate Detail updated.

SHEET E501 – ELECTRICAL POWER RISER

1. **REPLACE** Sheet E501 – Electrical Power Riser with the attached, updated E501 – Electrical Power Riser (Revision 2, Dated 10/19/23). Solar Photovoltaic (PV) Base Bid and Alternate Descriptions previously added in Addendum No. 1 added to drawing. Electric Vehicle (EV) Base Bid and Alternate Descriptions previously added in Addendum No. 1 added to drawing.

SHEET E601 – ELECTRICAL SCHEDULES

1. **REPLACE** Sheet E601 – Electrical Schedules with the attached, updated E601 – Electrical Schedules (Revision 2, Dated 10/19/23).

ATTACHMENTS:

- Specification Section 083600 – Sectional Overhead Doors (11 Pages, Dated 10/19/23)
- Specification Section 26 99 99 – Supervisory Control and Data Acquisition Systems Ethernet (9 Pages, Dated 10/19/23)
- Drawing Sheet – A100 Floor Plan (1 Sheet, Revision 2, Dated 10/19/23)
- Drawing Sheet – A701 Window & Door Schedules & Elevations (1 Sheet, Revision 2, Dated 10/19/23)
- Drawing Sheet – E102 – Electrical Power New Work Plan (1 Sheet, Revision 2, Dated 10/19/23)
- Drawing Sheet – E402 – Electrical Details (1 Sheet, Revision 2, Dated 10/19/23)
- Drawing Sheet – E404 – Electrical Details (1 Sheet, Revision 2, Dated 10/19/23)
- Drawing Sheet – E406 – Electrical Details (1 Sheet, Revision 2, Dated 10/19/23)
- Drawing Sheet – E407 – Electrical Details (1 Sheet, Revision 2, Dated 10/19/23)
- Drawing Sheet – E408 – Electrical Details (1 Sheet, Revision 2, Dated 10/19/23)
- Drawing Sheet – E501 – Electrical Power Riser (1 Sheet, Revision 2, Dated 10/19/23)
- Drawing Sheet – E601 – Electrical Schedules (1 Sheet, Revision 2, Dated 10/19/23)

END ADDENDUM NO. 2

Submitted by: Paul Stewart, AIA
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CC: General Contractor Distribution List
Attendees of October 5, 2023 General Contractor Non-Mandatory Pre-Bid Meeting
Plan Room / Plan Services (Carolinas AGC, Dodge Data & Analytics, HCAC, CMD Group, Construct Connect, NCIMED)
Contractors and Subcontractors that Requested Project Documents from WSA (Various)
Wake County Facilities Design & Construction
Design Team (Timmons Group, Dewberry)
File

SECTION 083600 - SECTIONAL OVERHEAD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following types of sectional overhead doors:
   1. Doors with aluminum-framed aluminum and full vision panels.
   2. Tracks configured for the following lift types:

      a. Standard.

B. Related Sections include the following:
   1. Division 9 Section "Painting" for field-applied paint finish.
   2. Division 26 Section "Conductors and Cables" for electrical service and connections for powered operators, and accessories.
   3. Division 26 Section "Disconnect Switches and Circuit Breakers" for disconnect switches and circuit breakers for powered operators.

1.3 DEFINITIONS

A. Operation Cycle: One complete cycle of a door begins with the door in the closed position. The door is then moved to the open position and back to the closed position.

1.4 PERFORMANCE REQUIREMENTS

A. General Performance: Sectional doors shall meet performance requirements specified without failure due to defective manufacture, fabrication, installation, or other defects in construction and without requiring temporary installation of reinforcing component.

B. Delegated Design: Design sectional doors, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Structural Performance: Provide sectional overhead doors capable of withstanding the effects of gravity loads and the following loads and stresses without evidencing permanent deformation of door components:

   1. Wind Load: Uniform pressure (velocity pressure) of 25.6 lbf/sq. ft. (1225.75 Pa), acting inward and outward.

      a. Basic Wind Speed: Refer to Structural Drawing S002.

D. Air Infiltration: Maximum rate not more than indicated when tested according to ASTM E 283.

1. Air Infiltration: Maximum rate of 0.08 cfm/sq. ft. (0.406 L/s per sq. m) at 15 and 25 mph (24.1 and 40.2 km/h).

E. Operation-Cycle Requirements: Provide sectional door components and operators capable of operating for not less than number of cycles indicated for each door. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

1. Design sectional overhead door components and operator to operate for not less than 75,000 cycles.

1.5 SUBMITTALS

A. Product Data: For each type and size of sectional overhead door and accessory. Include details of construction relative to materials, dimensions of individual components, profiles, and finishes. Provide roughing-in diagrams, operating instructions, and maintenance information. Include the following:

1. Setting drawings, templates, and installation instructions for built-in or embedded anchor devices.
2. Summary of forces and loads on walls and jambs.
3. Motors: Show nameplate data and ratings; characteristics; mounting arrangements; size and location of winding termination lugs, conduit entry, and grounding lug; and coatings.

B. Shop Drawings: For special components and installations not dimensioned or detailed in manufacturer's data sheets.

1. Wiring Diagrams: Detail wiring for power, signal, and control systems. Differentiate between manufacturer-installed and field-installed wiring and between components provided by door manufacturer and those provided by others.

C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for units with factory-applied finishes.

D. Samples for Verification: Of each type of exposed finish required, prepared on Samples of size indicated below and of same thickness and material indicated for Work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.

1. Frame: 6-inch (150-mm) length.
2. Panel: 6 inches (150 mm) square.

E. Delegated-Design Submittal: For sectional doors indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail fabrication and assembly of seismic restraints.
2. Summary of forces and loads on walls and jambs.

F. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

G. Manufacturers' Certificates: Signed by manufacturers certifying that they comply with requirements specified in "Quality Assurance" Article. On request, submit evidence of manufacturing experience.

H. Maintenance Data: For sectional doors to include in maintenance manuals.

I. Warranties: Sample of special warranties.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who is an authorized representative of the sectional overhead door manufacturer for both installation and maintenance of units required for this Project.

B. Manufacturer Qualifications: Engage a firm experienced in manufacturing sectional overhead doors similar to those indicated for this Project and with a record of successful in-service performance.

C. Source Limitations: Obtain sectional overhead doors through one source from a single manufacturer.

1. Obtain operators and controls from the sectional overhead door manufacturer.

D. Product Options: Drawings indicate size, profiles, and dimensional requirements of sectional overhead doors and accessories and are based on the specific system indicated. Other manufacturers' systems with equal performance and dimensional characteristics may be considered. Refer to Division 1 Section "Substitutions."

E. Standard for Sectional Doors: Fabricate sectional doors to comply with DASMA 102 unless otherwise indicated.

F. Listing and Labeling: Provide electrically operated fixtures specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.
2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of sectional doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures including, but not limited to, excessive deflection.
   b. Faulty operation of hardware.
   c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use; rust through.
   d. Delamination of exterior or interior facing materials.
2. Special Warranty Period: 3 Years / 20,000 Cycle for Door/Operator from date of Substantial Completion.

B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Special Finish Warranty Period to be "10 Year Delamination Warranty from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Aluminum Glass Door Model 521 (with Insulated Rails and Stiles and RAL Power Coat Option) by Overhead Door Corporation (2501 S. State Highway 121, Suite 200, Lewisville, Texas 75067, (800) 275-3290) or similar and equal product of another company, subject to compliance with requirements. Other similar products shall be submitted to the Architect a minimum of 7 days prior to the bid date and shall be approved in writing (via addendum) by the Architect.

B. Additional Manufacturers

1. Model 904U Architectural Series with Intellicore Insulated Aluminum Overhead Sectional Doors (with Color Blast Custom Paint Option) by Clopay Building Products Company, Inc. (8585 Duke Blvd., Mason, OH 45040, (513) 770-4800).

2. Aluminum Full-View Model 452 (with RAL Powder Coat Option) by Wayne Dalton (2501 S. Slate Hwy. 121 Business, Lewisville, TX 75067, (800) 827-3667).

2.2 DOOR ASSEMBLY

A. Full-Vision Insulated Aluminum Overhead Sectional Door: Sectional door formed with hinged sections.

B. Sectional Door Assembly: Stile and rail assembly secured with ¼" diameter through rods. Units shall have the following characteristics.

1. Operation Cycles: Not less than 75,000.
2. Panel thickness: 1-3/4"
3. Exterior Surface: Manufacturer's Standard Smooth.
4. Aluminum: 6061-T6 Extruded Aluminum | 6063-T5 Extruded Aluminum Alloy | 6063-T6 Extruded Aluminum.
5. Stile and Rails: Manufacturer's standard sizes, filled with Insulation.
6. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated. Door shall meet or exceed current energy requirements to meet NC State Building Code, U-Factor of 0.50.
7. Air Infiltration: 0.08 cfm/SF at 15 mph; 0.08 cfm/SF at 25 mph.
8. STC Rating: Class 26.
9. Heavy-Usage Package: Heavy Use Package to include high-cycle springs, high-cycle springs, and heavy-duty rollers as specified.
10. Heavy Duty Springs: 75000 cycles (Heavy Duty)
11. Fully Glazed Panel Glazing: Approximately sized and spaced apart the approximate distance as indicated on Drawings; and at height indicated on Drawings; installed with insulated glazing of the following type: ½" thermal pane/insulated tempered glass.

12. Finish and Color: Manufacturer's full range of anodized finishes OR Manufacturer's Full Range of Custom Powder Coat Finishes. Interior and exterior color to be selected by Architect from manufacturer's full range.
13. Hardware: Galvanized steel hinges and fixtures. Ball bearing roller with hardened steel races.
14. Lock: Interior mounted slide lock with interlock switch for automatic operator.
15. Weatherstripping: . Provide combination bottom weather seal and sensor edge EPDM bulb-type strip at bottom section, flexible jamb seals, and flexible header seal.
16. Track Configuration: Provide heavy-duty track as recommended by the manufacturer to suit loading required and clearances available (minimum 3" track).
17. Roller-Tire Material: Manufacturer's standard.
18. Manual Operation: Trolley operation with emergency release.

2.3 ALUMINUM DOOR SECTIONS

A. Aluminum Sections: ASTM B221 (ASTM B221M) extruded-aluminum stile and rail members of alloy and temper standard with manufacturer for type of use and finish indicated; in minimum thickness required to comply with requirements; with manufacturer's standard rail and stile dimensions and profiles; and with overlapped or interlocked weather- and pinch-resistant seal at meeting rails.

1. Door-Section Thickness: 1-3/4 inches (44 mm) to 2 inches (51 mm) (varies per manufacturer).
2. Section Reinforcing: Continuous horizontal and diagonal reinforcement as required to stiffen door and for wind loading. Ensure that reinforcement does not obstruct vision lites.

    a. Hardware Locations: Provide reinforcement for hardware attachment.

3. Insulated Stiles and Rails: Fill stiles and rails manufacturer's standard polyurethane expanding foam
4. Glazed Panels: Manufacturer's standard, aluminum-framed section with glazing sealed with glazing tape and aluminum glazing bead. Glazing as follows:

    a. Insulating Glass Units: Manufacturers' standard unit with tempered glass lites complying with ASTM C1048, Kind FT (fully tempered), Condition A (Type I, Class 1 (clear), Quality-Q3.

B. Reinforce bottom section with a continuous channel or angle conforming to bottom-section profile.

C. Reinforce sections with continuous horizontal and diagonal reinforcement, as required to stiffen door and for wind loading. Provide galvanized-steel bars, struts, trusses, or strip steel, formed to depth and bolted or welded in place. Ensure that reinforcement does not obstruct vision lites.

D. Provide reinforcement for hardware attachment.

E. Foamed-in-Place Thermal Insulation: Insulate interior of aluminum sections with door manufacturer's standard CFC-free polyurethane insulation, foamed in place to completely fill interior of section and pressure bonded to face sheets to prevent delamination under wind load, and with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84. Enclose insulation completely within aluminum sections that incorporate the following interior facing material, with no exposed insulation.

F. Fabricate sections so finished door assembly is rigid and aligned, with tight hairline joints and free of warp, twist, and deformation.

G. Windows:
1. One full view section with 1/2” clear insulated glass. Locations to comply with door elevation drawings. Color matched full view window consisting of aluminum stile and rail construction and color matched to door exterior with powder coat paint.
2. Size: Manufacturer's standard panel for type of glazing indicated.
3. Clear, Tempered: 1/2" Insulated, Low E.

2.4 TRACKS, SUPPORTS, AND ACCESSORIES

A. Tracks: Provide manufacturer's standard, galvanized steel track system, sized for door size and weight, designed for lift type indicated and clearances shown, and complying with ASTM A 653 (ASTM A 653M), for minimum G60 (Z180) zinc coating. Provide complete track assembly including brackets, bracing, and reinforcement for rigid support of ball-bearing roller guides for required door type and size. Slope tracks at proper angle from vertical or otherwise design to ensure tight closure at jambs when door unit is closed. Weld or bolt to track supports.

1. Min. Width of track 3"

B. Track Reinforcement and Supports: Provide galvanized steel track reinforcement and support members, complying with ASTM A 36 (ASTM A 36M) and ASTM A 123. Secure, reinforce, and support tracks as required for door size and weight to provide strength and rigidity without sag, sway, and vibration during opening and closing of doors.

C. Support and attach tracks to opening jambs with continuous angle welded to tracks and attached to wall. Support horizontal (ceiling) tracks with continuous angle welded to track and supported by laterally braced attachments to overhead structural members at curve and end of tracks.

D. Weatherseals: Provide replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom and at top of overhead door.

1. Provide motor-operated doors with combination bottom weatherseal.
2. In addition, provide continuous flexible seals at door jambs for a weathertight installation.

2.5 HARDWARE

A. General: Provide heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless-steel, or other corrosion-resistant fasteners, to suit door type.

B. p

1. 3” Case-hardened steel tires.

C. Push/Pull Handles: For push-up-operated or emergency-operated doors, provide galvanized steel lifting handles on inside of door.

2.6 COUNTERBALANCING MECHANISM

A. Torsion Spring: Counterbalance mechanism consisting of adjustable-tension torsion springs fabricated from steel-spring wire complying with ASTM A 229/A 229M, mounted on torsion shaft made of steel tube or

solid steel. Provide springs designed for number of operation cycles indicated. Connect to door with galvanized aircraft-type lift cables with cable safety factor of at least 7 to 1. Provide springs calibrated for 75,000 cycles minimum.

B. Cable Drums and Shaft for Doors: Cast-aluminum or gray-iron casting cable drums mounted on torsion shaft and grooved to receive door-lifting cables as door is raised. Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of torsion shaft. Provide one additional midpoint bracket for shafts up to 16 feet (4.88 m) long and two additional brackets at one-third points to support shafts more than 16 feet (4.88 m) long unless closer spacing is recommended by door manufacturer.

C. Bracket: Provide anchor support bracket, as required to connect stationary end of spring to the wall, to level shaft and prevent sag.

D. Provide a spring bumper at each horizontal track to cushion door at end of opening operation.

2.7 ELECTRIC DOOR OPERATORS

A. General: Provide electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operational life specified, complete with electric motor and factory-prewired motor controls, starter, solenoid-operated brake, clutch, remote-control stations, control devices, integral gearing for locking door, and accessories required for proper operation.

B. Comply with NFPA 70.

C. Provide control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6; with NFPA 70, Class 2 control circuit, maximum 24-V ac or dc.

D. Disconnect Device: Provide hand-operated disconnect or mechanism for automatically engaging sprocket-chain operator and releasing brake for emergency manual operation while disconnecting motor, without affecting timing of limit switch. Mount disconnect and operator so they are accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.

E. Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency auxiliary operator.

F. Provide control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V, ac or dc.

G. Door-Operator Type: Unit consisting of electric motor, gears, pulleys, belts, sprockets, chains, and controls needed to operate door and meet required usage classification:

1. Trolley: Trolley operator mounted to ceiling above and to rear of door in raised position and directly connected to door with drawbar

H. Electric Motors: Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Division 11 Section "Common Motor Requirements for Equipment" unless otherwise indicated.

1. Electrical Characteristics:
   a. Phase: Single.
   b. Volts: Coordinate with use and available power supply.
   c. Hertz: 60.
2. Service Factor: According to NEMA MG 1, unless otherwise indicated.
3. Coordinate wiring requirements and electrical characteristics of motors with building electrical system.
4. Minimum Operator size 3/4 hp, 230 volts single phase.
5. Provide open dripproof-type motor, and controller with NEMA ICS 6, Type 1 enclosure.

I. Remote-Control Station: Provide momentary-contact, 3-button control station with push-button controls labeled "Open," "Close," and "Stop."

1. Provide interior units, full-guarded, flush-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.

2. Provide bank of three flush mounted wall controls adjacent to Door 113E that control each of the Vehicle Bay 113 sectional overhead doors. Coordinate location with Owner/Architect.

3. Provide dedicated flush mounted wall control adjacent to each sectional overhead door. Coordinate location with Owner/Architect

J. Obstruction Detection Device: Provide each motorized door with indicated external automatic safety sensor able to protect full width of door opening. Activation of sensor immediately stops and reverses downward door travel.

1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in door opening without contact between door and obstruction.
   a. Self-Monitoring Type: Designed to interface with door operator control circuit to detect damage to disconnection of sensing device. When self-monitoring feature is activated, door closes only with sustained pressure on close button.
   b. Provide two pairs of photo electric sensors per overhead sectional door

K. Limit Switches: Provide adjustable switches, interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.

L. Radio Control: Provide radio control system consisting of the following:

1. 4-channel universal coaxial receiver to open, close, and stop door, 2 per door.

2. Provide door operation equipment that functions with the existing Wake County EMS vehicle remote controllers. Subcontractor shall meet with Wake County EMS personnel, Owner, and Architect to coordinate control settings to ensure that door operators function with existing Wake County remote control device systems.

M. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf (111 N).

N. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

O. Audible and Visual Signals: Audible alarm and visual indicator lights in compliance with regulatory requirements for accessibility.

P. Traffic Signal Lights:
1. Stop-go 8” traffic signal lights in polycarbonate enclosures.
2. Enclosure: NEMA 1.
3. Light Size: 8” with visors and bulbs.
4. Location: Mount on Vehicle Bay interior walls on driver side of vehicle bay as shown on project drawings.

Q. Exterior Loop Detectors:
1. Provide 6’-0” x 12’-0” traffic rated preformed loop detectors embedded in concrete driveway apron (pave-over application) at each overhead door.
2. Provide 115V loop detector housed in NEMA 4/12 enclosure.
3. Exterior loop detector to open vehicle bay overhead doors on contact when vehicles are in reverse / being backed into vehicle bays. Loop detector to hold doors open for pre-determined period of time before closing overhead doors.
4. Exterior loop not allowed to have any sharp turns.
5. Exterior loop shall not have any splices.
6. Exterior loop must be 2” away from wire mesh or reinforcing in concrete driveway slab.

R. Exhaust Fan Interlock Operation
1. Sectional overhead doors to be interlocked into controls for Vehicle Bay Exhaust Fan EF-1 and contact for Vehicle Bay carbon monoxide detector.
2. When an alarm signal is received from the Vehicle Bay carbon monoxide detector, all sectional overhead doors will open to a predetermined elevation to allow fresh air in to the bays. Alarm signal will also simultaneously activate Vehicle Bay Exhaust Fan EF-1.

2.8 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Finishes
1. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.
   a. Aluminum Finish: Comply with AAMA 2604 requirements for pigmented organic coatings applied to aluminum extrusions and panels.
   b. Color and Gloss: As selected by Architect from manufacturer's full range.

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

   a. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

b. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

1) Color: As selected by Architect from manufacturer's full range.

3. Finish of Interior Facing Material: Manufacturer's Standard White.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine wall and overhead areas, including opening framing and blocking, with Installer present, for compliance with requirements for installation tolerances, clearances, and other conditions affecting performance of Work of this Section.

B. Examine locations of electrical connections.

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

3.2 INSTALLATION

A. General: Install door, track, and operating equipment complete with necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports according to Shop Drawings, manufacturer's written instructions, and as specified.

B. Fasten vertical track assembly to framing at not less than 24 inches (600 mm) o.c.

C. Hang horizontal track from structural overhead framing with angle or channel hangers welded and bolt fastened in place. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.'

D. Accessibility: Install sectional doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

3.3 STARTUP SERVICES

A. Engage a factory-authorized service representative to perform startup service.
1. Complete installation and startup checks according to manufacturer's written instructions.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

A. Lubricate bearings and sliding parts; adjust doors to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.

B. Adjust belt-driven motors as follows:

1. Use adjustable motor-mounting bases for belt-driven motors.

2. Align pulleys and install belts.
3. Tension belt according to manufacturer's written instructions.

3.5 DEMONSTRATION

A. Startup Services: Engage a factory-authorized service representative to perform startup services and to train Owner's maintenance personnel as specified below:

1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
2. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive maintenance.
3. Review data in the maintenance manuals. Refer to Division 1 Section "Contract Closeout."
4. Review data in the maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."
5. Schedule training with Owner with at least 7 days' advance notice.

END OF SECTION 083600

SECTION 26 99 99-SUPERVISORY CONTROL AND DATA ACQUISITION SYSTEMS VERSION 1.2

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. MOSCAD Remote Terminal Unit (RTU) equipment.

B. DEMARC equipment.

C. Input/Output Sensors.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.3 SUMMARY

A. This Section includes equipment for monitoring and controlling remote systems and components, including generators, lift stations and pumping stations.

1.4 RELATED SECTIONS

A. Section 263600-Transfer Switches

B. Section 263213-Engine Generators

1.5 SYSTEM DESCRIPTION

A. Supervisory Control and Data Acquisition (SCADA) Contractor shall provide:

1. A fully assembled and operational MOSCAD RTU and Demarc control Panel.
2. All wiring, conduit, panels, for all SCADA controls and data acquisition.
3. All final electrical connections.
4. Contractor shall be responsible for all electrical work associated with the SCADA system and as called for on the Drawings.

    a. Perform all wiring in accordance with all local and national codes.
    b. Install all line voltage wiring, concealed or exposed, in accordance with Division 16.
    c. Contractor shall provide 120 volt, 20 amp circuits and circuit breakers from normal and/or emergency power panel for SCADA systems.
    d. All low voltage electrical control wiring throughout the building shall be installed in accordance with Division 16.

B. General Product Description:
   1. The supervisory control and data acquisition system (SCADA) shall provide control and data acquisition to remote equipment sites. The functions including equipment supervision and control, alarm management, energy management, and data collection. The Supervisory Control and Data Acquisition system shall be fully compatible and shall be fully integrated with the existing Wake County owned 800 MHz system presently owned and operated by Wake County. MOSCAD-L or MOSCAD-M are not acceptable
   2. The supervisory control and data acquisition system shall consist of the following: Motorola MOSCAD RTU, DEMARC Panel and all required accessories.

1.6 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections. A minimum of 7 complete sets of documents are required. Submit 3 copies of all submittals to owner at time of submittal to architect.

B. Manufacturer's Product Data for each and all types of products specified. Include manufacturer's technical Product Data for each device furnished, indicating dimensions, capacities, performance characteristics, electrical characteristics, finishes of materials, installation instructions, and startup instructions.

C. Shop Drawings from manufacturer detailing equipment assemblies and indicating dimensions, weights, loadings, required clearances, method of field assembly, components, and location and size of each field connection

D. Certificate for Motorola Certified MOSCAD Solution Provider and certificate for Wonderware Certified System Integrator from preferred vendor (prime or subcontractor).

1.7 PROJECT RECORD DOCUMENTS

A. Submit under provision of Division 1.

B. Accurately record actual location of components, including but not limited to, panels and sensors.

C. Revise shop drawings to reflect actual installation.

D. Provide hard copy and electronic files

1.8 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division 1.

B. Maintenance instructions and spare parts list for each type of device.

C. Interconnection wiring diagrams with identified and numbered system components and devices.

D. Inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.

E. Calibration records and list of set points.

1.9 QUALIFIFCATIONS & QUALITY ASSURANCE

A. Materials and equipment shall be the catalogued products of manufacturers regularly engaged in production and installation of SCADA systems and shall be manufacturer's latest standard design that complies with the specification requirements.

B. Install system using competent workmen who are fully trained in the installation of SCADA equipment.

C. Motorola MOSCAD equipment and related programming will be executed by a firm which is both a Motorola Certified MOSCAD Solution Provider and Wonderware Certified System Integrator.

D. Contractor MUST obtain a translation file from Wireless Communications that will allow the new SCADA system to communicate with the County's existing head-in equipment.

1.10 INPUT/OUTPUT SUMMARY

A. Refer to Sheet E407 for list of points.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Motorola.

B. No others will be accepted. In addition, in order to provide a complete and working system the component manufacturers listed in this specification MUST be provided with no substitutions.

2.2 MOSCAD RTU

A. General:

1. The remote terminal unit (RTU) shall be an intelligent, modular unit capable of both data acquisition and local data processing. It shall monitor and control local equipment in a stand alone mode as well as being an intelligent node in a distributed processing system. It shall be microprocessor based and allow reconfiguration and optimization to occur via software only. To facilitate installation, maintenance and future expansion, all In- put/Output (I/O) modules shall connect to the basic processor module via a passive motherboard on the RTU rack. A PC-compatible computer running a single, comprehensive standard application development and diagnostic software package shall be used for program development and downloading (directly to the RTU).

Each RTU must be supplied with the number and type of I/O points as indicated elsewhere in the plans and specifications. Future expansion shall be possible by simply plugging in additional I/O modules to the I/O bus. Each RTU shall be supplied with the following minimum configuration:

a. Mother Board.
b. Power Supply.
c. I/O Bus.
d. Battery.

e. Enclosure.
f. I/O Modules as required.
g. CPU Processor Module.
h. Communications Interface.

B. Communications:

1. General: The RTU shall support the establishment of a sophisticated data communication network for SCADA applications utilizing ethernet, smart zone compatible and flash port upgradeable.
2. Data Protocol: Data communications shall utilize a secure, smart protocol designed in accordance with the Open System Interconnection (OSI) model as defined by the International Organization for Standardization (ISO). The protocol should allow flexible, efficient communications for transmission of data, complete programs, databases or other parameters. Complete configuration and diagnostic programs shall be transferable from/to the Central site (full data upload/download capability). Complete RTU/system debugging shall be allowed without visiting each remote site. The protocol shall support a complex hierarchical system structures of multiple host computers and sub-master stations. Its detail structure, however shall be transparent to the system user and allow him to concentrate upon the application.

C. Communications Methods:

1. In addition to the simplistic master/slave polling configuration, the RTU shall operate in a number of more efficient contention formats required by point to multipoint networks. The RTU must support quiescent operation and initiate data transmissions under the following conditions:

   a. Report by Exception - Automaticallytransmit upon defined exception condition(s); analog, digital or any combination.
   b. Timed Transmission -Automatically transmit data on programmed time interval.

D. Hardware Modules:

1. Basic Processor Module: The basic processor module (CPU) of the RTU shall be a real time process controller and support:

   a. Bus communication with I/O modules.
   b. System memory allocation.
   c. System parameter/logic programming.
   d. Communication port control.

2. The Central Processing Unit (CPU) shall be a high speed (200MHz), 32 bit microprocessor, Motorola MPC8270 or equivalent. This VLSI design must incorporate a separate co-processor to handle all external communication tasks so as to not affect base CPU performance.
3. The CPU shall be equipped with a minimum of 16 mbyte on-board memory of different types.

   EPROM - for system programs
   RAM - for data and parameters

FLASH(EEPROM) - for application programs

Total RTU memory must be expandable to a minimum of 32 Mbyte. Provision must be available to add anumerical co-processor with true double precision floating point capabilities along with additional memory and support for trigonometric and transcendental functions.

4. The CPU module must incorporate a real-time clock (RTC) with lithium battery backup for both RTC and module RAM. Large scale CMOS gate array technology must be used for minimum component count and maximum performance and reliability. CPU features include:

   a. Watch-dog timer (WDT).
   b. Symbolic debugging support.
   c. Diagnostic LED indication.
   d. Power monitor for clean program start/stop.

5. The CPU module must include at least the three built-in communication ports as listed below:

   a. Port 1: RS-232 or RS-485, software controlled, full DCE/DTE operation to 9600 bps.
   b. Port 2: RS-232, full DCE/DTE, 9600bps, transient protected.
   c. Port 3: Configurable (Plug-In) communication module for radio, wireline, and trunked radio, and dial-up wire line, 600-9600 bps, dependent upon media.

6. Support shall be available for additional serial channels, second radio, wireline or other external communications.

E. Input/Output Modules:

1. The RTU shall address variable I/O requirements by the addition of appropriate expansion modules. Each module shall communicate with the CPU module via a high speed (> 1 Mbps) data bus. Up to 44 modules shall be supported by a single CPU module; dual CPU configurations shall optionally be available. Each expansion module may be plugged into an empty slot on the I/O bus.
2. All modules, regardless of type (unless specifically noted), must share the following features:

   a. Input Protection: dc/dc converter with 2.5kv optical isolation per IEEE SWC 472/587.
   b. Output Protection: 1 kv between contacts, 1.5kv between contact and coil per IEEE SWC 472 CMOS Gate Array: all logic, bus and LED interface contained in one gate array on each module to minimize components and increase reliability.
   c. Diagnostics: Loopback test, system clock, WDT, 20 diagnostic LED indicators of status and module failure modes.
   d. Terminal Boards: Removable, Phoenix type up to 14 AWG (2.5 sq. mm) or DIN connector.

3. Module Identification: Check hardware I/O versus application specification.

4. Digital Input Module - Type 1:

    a. Capacity: 16 dry contacts, all isolated inputs; 2 high speed counters (up to 10 Khz).
    b. Counters: All base inputs may be defined as low speed counters, 50-500Hz.
    c. Interrupt-Handling: Change of State (COS) reporting to 1 ms in interrupt mode.
    d. Input filtering 1-32 ms, software controlled.

5. Digital Output Module:

    a. Capacity: 16 electrically-energized relay contacts.

6. Analog Input Module:

    a. Capacity: 8 floating, isolated inputs.
    b. Type: 4-20Ma.
    c. Resolution: 13 bits including sign.
    d. Accuracy/Linearity: +/- 0.05 % full scale/ +/- 1 LSB.
    e. Calibration: Automatic, software controlled (no potentiometer).

7. Analog Output Module:

    a. Capacity: 4 optically isolated outputs.
    b. Type: 0-5 V or 4-20Ma performance dependent upon power supply.
    c. Resolution: 12 bits including sign.
    d. Accuracy: +/- 0.1 % full scale.

F. Construction:

1. The RTU shall be totally modular in design and construction, allowing specific configuration merely by plugging in the appropriate CPU and I/O modules. All modules and their assembly shall be accomplished without screws or fasteners of any type. All connections shall utilize a “snap-in” action and a tool shall be supplied to aid easy connector removal. The RTU shall be available in several sizes to fit different application requirements including 3, 6, 8 and 16 module assemblies. Basic RTU models shall consist of a mounting plate and motherboard, a CPU module (occupies 1 slot) and a power supply/charger.
2. All elements must use CMOS components and LSI circuitry. No jumpers, DIP switches, or adjustable potentiometers shall be allowed. Extensive use of SMD (surface mount device) is required.
3. Front access to all controls, indicators, lithium battery and external cables shall be provided. Motherboard connection to I/O modules shall be direct; no daisy chain or multiple ribbon cable connections allowed.
4. All I/O modules shall be equipped with a front cover door to serve as: module latch release, wiring identification label and terminal board protection. Space shall be available to direct and route external wires from outside the RTU that are connected to the I/O modules.

G. Enclosures:

1. The RTU shall be wall mounted NEMA 4X, stainless steel.

H. Environmental:

1. The RTU must operate over an ambient temperature range of -30 to +60 degrees C with relative humidity < 95% @ 50 degrees C. It must meet or exceed EIA standards RS-204B and RS-152B.
2. The RTU shall meet or exceed the SWC standards as defined in IEEE C37.90A for all inputs and outputs. In the appropriate enclosure, the RTU shall meet all qualifications for UL 611, paragraph 26.
3. The RTU shall operate from 115/230 VAC, ▯ 15%, 50/60 Hz primary power. A battery and charging circuit shall be included to provide 4 hour standby operation (for defined RTU capacity and use). Larger capacity batteries shall be available to extend operating time.

I. Application Software & Related Programming:

1. Operating System: The software shall be based upon a multi-tasking executive system optimized for real-time environments, Motorola's Object Oriented MTE or equivalent.
2. Application Software: The RTU shall be programmed with a high level, multiple process ladder diagram language which includes Boolean and arithmetic functions as well as specialized function blocks such as proportional, integral, derivative (PID) control and American Gas Association (AGA) flow calculations. The ladder diagrams shall be used for process definitions as well as symbolic monitoring and debugging.
3. Motorola MOSCAD hardware must be programmed and configured with the appropriate RTU software application program by Motorola 'Certified MOSCAD Solution Provider' / Wonderware Certified System Integrator firm.
4. The MOSCAD engineer will program/download the application program to be executed in the RTU utilizing the Programming Toolbox. This includes but is not limited to downloading the site configuration, application program and network configuration.
5. **RTU shall be Motorola ACE3680.**

2.3 DEMARC PANEL

A. Enclosure shall be AM Products, series JIC size junction box, Stainless steel.

B. DIN Rail shall be Automation Direct, Rail # DN-R3551.

C. Terminal blocks shall be Automation Direct # DN-T10, gray, DN-T10-BLK, black, DN-T10-GRN, green.

D. Loop power supply shall be Automation Direct # PS24075D.

2.4 INPUT/OUTPUT SENSORS

A. AC current transducer shall be an American Aerospace Controls, Inc., series 100 SX, 4 to 20 mA, 2 wire operation.

B. Room temperature transmitter shall be Kele Model ST-T91E, 1000 OHM platinum room temperature transmitter.

C. AC voltage transducer shall be an American Aerospace Controls, Inc., series VX, 4 to 20 mA loop powered.

D. Monitoring system battery voltage system shall be Engineering Concepts Unlimited, Inc., Model ECU-VLD2-12 for 12 volt system or Model ECU-VLD2-24 for 24 volt system.

E. Electronic engine speed sensor shall be Thomson Technology Model FSR 230.

F. Single station level switch shall be Gems sensor.

G. Relay shall be cube electro-mechanical type with LED. The relay shall be rated for ampere and voltage as required for the application.

H. Relay sockets shall be compatible with cube relay.

2.6 RACEWAY

A. EMT: Electrical metallic tubing; ANSI C80.3, zinc-coated steel, with compression fittings.

B. FMC: Flexible metal conduit; zinc-coated steel.

C. LTMC: Liquid-tight flexible metal conduit; zinc-coated steel with sunlight-resistant and mineral- oil-resistant plastic jacket

2.7 WIRES, CABLES, AND CONNECTIONS

A. Conductor, minimum No. 14, Solid or stranded copper.

B. Insulation: Thermoplastic, rated 600 V, 75 deg C minimum, Type THHN.

C. Wire Connectors and Splices: Units of size, ampacity rating, material, type, and class suitable for service indicated.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify that field end devices and wiring are installed before proceeding with installation.

3.2 INSTALLATION

A. Install equipment as indicated to comply with manufacturer's written instructions.

B. Verify location of sensor and panels with plans before installation.

C. Install labels and nameplates to identify components.

D. Install electrical work in accordance with Division 16. Electrical material and installation shall be in accordance with appropriate requirements of Division 16.

3.3 MANUFACTURER'S FIELD SERVICES

A. Prepare and start systems under provisions of Division 1.

B. Start-up systems. Allow sufficient time for start-up prior to placing systems in permanent operation.

3.4 COMMISSIONING

A. Test and adjust safeties and communications.

B. Replace damaged or malfunctioning components and equipment.

C. Start, test, and adjust systems.

D. Demonstrate compliance with requirements.

3.5 DEMONSTRATION

A. Demonstrate a complete and fully operational system to Owner.

END OF SECTION 26 99 99

KEYED PLAN NOTES:

K1. SLOPE FLOOR TO DRAIN @ 1/8" PER FOOT.
K2. MOP SINK. SEE PLUMBING.
K3. EMERGENCY EYE WASH. 36"x60" CLEAR AREA AT EMERGENCY EYE WASH STATION. SEE PLUMBING.
K4. HIGH / LOW ADA ACCESSIBLE DRINKING FOUNTAIN WITH BOTTLE FILL STATION.
K5. OVERHANG ABOVE.
K6. DOUBLE TIER LOCKER (TYP.)
K7. WINDOW ABOVE CUT PLANE.
K8. ICE MACHINE. CONTRACTOR FURNISHED / CONTRACTOR INSTALLED.
K9. WASHER / DRYER. CONTRACTOR FURNISHED / CONTRACTOR INSTALLED.
K10. HOT WATER HEATER.
K11. MILLWORK.
K12. SHELVING.
K13. REFRIGERATOR. CONTRACTOR FURNISHED / CONTRACTOR INSTALLED.
K14. DISHWASHER. CONTRACTOR FURNISHED / CONTRACTOR INSTALLED.
K15. RANGE W/ MICROWAVE ABOVE. CONTRACTOR FURNISHED / CONTRACTOR INSTALLED.
K16. PANTRY.
K17. STEEL 6" PIPE BOLLARD FILLED WITH CONCRETE, WITH HDPE PROTECTIVE PLASTIC COVER.
K18. FLOOR DRAIN (NO FLOOR SLOPE TO DRAIN.)
K19. GENERATOR / SCADA EQUIPMENT. SEE ELECTRICAL.
K20. CONDENSER UNIT. SEE MECHANICAL.
K21. SPACE ALLOCATION FOR GAS METER. SEE PLUMBING.
K22. 5'-0" x 8'-0", 6" THICK CONCRETE PAD CENTERED ON DOOR 119.
K23. GRAVEL MECHANICAL YARD. SEE CIVIL.
K24. FULLY RECESSED KNOX BOX MOUNTED AT 44" AFF.
K25. DOOR BELL.
K26. BUILDING DEDICATION PLAQUE MOUNTED 60" FROM CENTER OF PLAQUE TO FINISHED FLOOR. SEE SHEET A802.
K27. PROVIDE ROLLER SHADES AT KEY NOTED WINDOWS.
K28. FLAT SCREEN TELEVISION AND ASSOCIATED WALL MOUNT.
K29. 95-GALLON ROLL-AWAY TRASH/RECYCLING CONTAINER.
K30. 3/4" FIRE RETARDANT TREATED PLYWOOD FROM 24" AFF TO SCHEDULED CEILING, ATTACHED DIRECTLY TO CMU ON ALL WALLS IN TELECOM 117. PAINT AS SCHEDULED. MINIMUM OF ONE (1) PLYWOOD RATING LABEL TO REMAIN UNPAINTED ON EACH SHEET OF PLYWOOD.
K31. VEHICLE BAY GROUND LOOP LOCATED MINIMUM OF 14'-0" FROM EXTERIOR FACE OF BUILDING. SEE SHEET E403.
K32. SEE MECHANICAL, PLUMBING, & ELECTRICAL DRAWINGS FOR EQUIPMENT SPECIFIC CONCRETE PADS.
K33. VEHICLE BAY INTAKE/EXHAUST FANS ABOVE. SEE MECHANICAL.
K34. TRANSFORMER (NOT SHOWN). SEE ELECTRICAL. COORDINATE REQUIRED CLEARANCES AROUND TRANSFORMER WITH TOWN OF APEX UTILITIES DEPARTMENT.
K35. 36" x 10" FLOOR MOUNTED WOOD BENCH.
K36. STEEL GATE(S) AT SCREEN WALL.
K37. COORDINATE REQUIRED CLEARANCE AROUND GENERATOR WITH SELECTED GENERATOR MANUFACTURER.
K38. CONCRETE SPLASH BLOCK AT CONDENSATE DRAINS. COORDINATE WITH MECHANICAL.
K39. INTERIOR CMU MCJ IN VEHICLE BAYS 113 PLAN EAST WALL. SEE EXTERIOR ELEVATIONS (A201) FOR OTHER MCJ.
K40. TELECOMMUNICATIONS RACK AND CABLE TRAYS. SEE ELECTRICAL.
K41. OIL/WATER SEPARATOR HIGH OIL ALARM. COORDINATE WITH PME.
K42. ELECTRICAL SERVICE ENTRANCE DISCONNECT. SEE ELECTRICAL.
K43. 30"x36" CLEAR AREA AT ELECTRICAL SERVICE ENTRANCE DISCONNECT.
K44. 61"x46" CLEAR AREA AT SPRINKLER RISER. SEE FIRE PROTECTION.
K45. RAISED CONCRETE HOUSEKEEPING PAD. COORDINATE WITH PME.
K46. WALL MOUNTED DOOR BELL CHIME. COORDINATE WITH ELECTRICAL.
K47. 3" WIDE YELLOW SAFETY STRIPING (ULINE MIGHTY LINE DELUXE SAFETY TAPE).
K48. TRANSLUCENT WINDOW FILM ON STOREFRONT DOOR 109 FULL LITE GLAZING (3M FASARA MILANO #SH2MAML 59%) (APPLIED TO INTERIOR SIZE OF GLAZING).
K49. ALARMED DOOR SIGNAGE APPLIED DIRECTLY TO DOOR 106B.
K50. METAL STUD FRAMED WALLS WITH GWB (BOTH SIDES) ABOVE CMU AT MECHANICAL ROOM 122 INTERIOR WALLS. SEE WALL SECTION J10/A301.

WALL LEGEND | SEE DRAWING G104 FOR ENLARGED WALL TYPE DETAILS

GRAPHIC MARK	TYPE	DESCRIPTION	UL DTL
	A1	NON-RATED EXTERIOR WALL ASSEMBLY: 8" CMU, 2" SPRAY FOAM INSULATION, AIR SPACE, AND MASONRY VENEER.	
	A2	NON-RATED EXTERIOR WALL ASSEMBLY: 8" CMU, 2" SPRAY FOAM INSULATION, AIR SPACE, AND MASONRY VENEER WITH INTERIOR 7/8" FURRING CHANNELS @ 16", 5/8" GWB	
	B1	NON-RATED EXTERIOR WALL ASSEMBLY: 8" CMU WITH MASONRY VENEER.	
	B2	NON-RATED EXTERIOR WALL ASSEMBLY: 4" CMU WITH MASONRY VENEER BOTH SIDES.	
	C1	NON-RATED INTERIOR WALL ASSEMBLY: 8" CMU WITH 2" SPRAY FOAM INSULATION AND 3 5/8" METAL STUDS @ 16" O.C. WITH 5/8" GWB.	
	D1	NON-RATED INTERIOR WALL ASSEMBLY: 8" CMU.	
	D2	NON-RATED INTERIOR WALL ASSEMBLY: 8" CMU WITH 3 5/8" METAL STUDS @ 16" O.C. AND 5/8" GWB BOTH SIDES ABOVE.	

GRAPHIC MARK	TYPE	DESCRIPTION	UL DTL
	E1	NON-RATED INTERIOR WALL ASSEMBLY TO 8" ABOVE CEILING: 6" METAL STUDS @ 16" O.C. WITH 5/8" GWB BOTH SIDES.	
	E2	NON-RATED INTERIOR WALL ASSEMBLY TO 8" ABOVE CEILING: 6" METAL STUDS @ 16" O.C. WITH BATT INSULATION AND 5/8" GWB BOTH SIDES.	
	E3	**1-HOUR RATED FIRE PARTITION** INTERIOR WALL ASSEMBLY TO UNDERSIDE OF ROOF: 6" METAL STUDS @ 16" O.C. WITH BATT INSULATION AND 5/8" GWB BOTH SIDES.	U419
	F1	NON-RATED INTERIOR WALL ASSEMBLY TO 8" ABOVE CEILING: 3 5/8" METAL STUDS @ 16" O.C. WITH 5/8" GWB BOTH SIDES.	
	F2	NON-RATED INTERIOR WALL ASSEMBLY TO 8" ABOVE CEILING: 3 5/8" METAL STUDS @ 16" O.C. WITH BATT INSUL AND 5/8" GWB BOTH SIDES.	
	F3	**1-HOUR RATED FIRE PARTITION** INTERIOR WALL ASSEMBLY TO UNDERSIDE OF ROOF: 3 5/8" METAL STUDS @ 16" O.C. WITH BATT INSULAND 5/8" GWB BOTH SIDES.	U419
	G1	NON-RATED INTERIOR PARTITION WALL ASSEMBLY TO 6'-8" ABOVE FINISHED FLOOR: 2 1/2" METAL STUDS @ 16" O.C. WITH 5/8" GWB BOTH SIDES.	
	G2	NON-RATED INTERIOR WALL ASSEMBLY TO 8" ABOVE CEILING: 2 1/2" METAL STUDS @ 16" O.C. WITH 5/8" GWB ONE SIDE.	

GENERAL PLAN NOTES:

G1. FIELD VERIFY ALL DIMENSIONS AND CONDITIONS.
G2. ALL DIMENSIONS ARE TO FACE OF MASONRY OR FACE OF STUD UNLESS OTHERWISE INDICATED.
G3. PROVIDE BLOCKING FOR ALL EQUIPMENT AND ACCESSORIES AS REQUIRED. COORDINATE LOCATIONS. ALL BLOCKING IN WALLS TO BE FIRE RETARDANT.
G4. PROVIDE 1/4" PER FOOT FLOOR SLOPE TO FLOOR DRAINS UNLESS OTHERWISE INDICATED.
G5. VERIFY ROUGH OPENING DIMENSIONS WITH SELECTED WINDOW MANUFACTURER.
G6. FLOOR PLAN CUT PLANE HEIGHT VARIES TO SHOW ALL OPENINGS.
G7. SEE ELEVATIONS ON SHEET A201 FOR MASONRY CONTROL JOINT LOCATIONS. MASONRY CONTROL JOINTS IN CMU WALLS TO ALIGN WITH MASONRY CONTROL JOINT IN MASONRY VENEER. SEE DETAILD1/A401
G8. SEE SHEET A701 FOR WINDOW SCHEDULE AND ELEVATIONS.
G9. SEE SHEET A801 FOR FINISH SCHEDULE, FINISH PLANS, AND NOTES REGARDING WINDOW TREATMENTS.
G10. SEE SHEET A802 FOR SIGNAGE SCHEDULE AND ELEVATIONS.
G11. SEE SHEET S101 FOR CONCRETE SLAB CONTROL JOINTS.
G12. ALL FLOOR SLAB VAPOR BARRIER SEAMS AND PENETRATIONS TO BE TAPED. ALL RIGID INSULATION JOINTS TO BE TAPED.

FLOOR PLAN LEGEND

GRAPHIC MARK	DESCRIPTION
FACP	FIRE ALARM CONTROL PANEL
P	FIRE ALARM MANUAL PULL STATION
	FIRE ALARM SPEAKER & STROBE DEVICE (SEE ELECTRICAL FOR TYPE)
	FIRE ALARM STROBE DEVICE (SEE ELECTRICAL FOR TYPE)
MR	FIRE ALARM DUCT DETECTOR REMOTE ALARM INDICATOR
WF	FLOW TYPE SPRINKLER SWITCH
VS	TAMPER TYPE SPRINKLER SWITCH
W	WIRELESS ACCESS POINT
CR	CARD READER
FE	SEMI-RECESSED FIRE EXTINGUISHER CABINET

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed on the cover sheet of these construction plans.

Transportation Engineering
Building Inspections
Water Resources - Utility Engineering
Electric
Water Resources - Soil & Erosion Control
Water Resources - Stormwater
Planning
Planning - Transportation
Fire
Parks, Recreation & Cultural Resources

NO.	DESCRIPTION	DATE
1	BID DOCUMENTS	09/25/23
2	ADDENDUM 2	10/19/23

WILLIARD STEWART ARCHITECTS, P.A. REGISTERED ARCHITECTURE & CORPORATE NORTH CAROLINA RALEIGH, NC 50684
PAUL W. STEWART III REGISTERED ARCHITECT 11286 NORTH CAROLINA RALEIGH, N.C. 10/19/23
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WAKE COUNTY
APEX MAIN EMS STATION
6950 APEX BARBECUE ROAD
APEX, NORTH CAROLINA 27502

WSA PROJECT NUMBER: 600-19-01

OWNER: WAKE COUNTY FACILITIES DESIGN & CONSTRUCTION

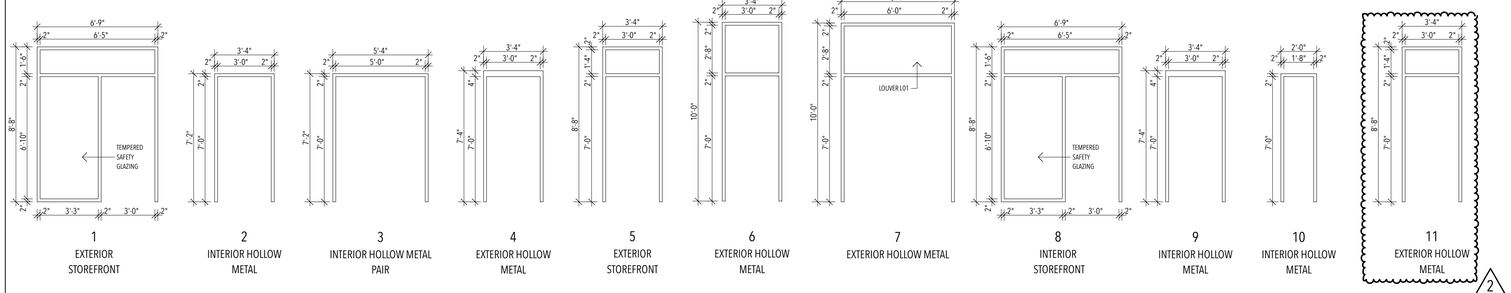
CONSTRUCTION DOCUMENTS

DRAWING TITLE:
FLOOR PLAN

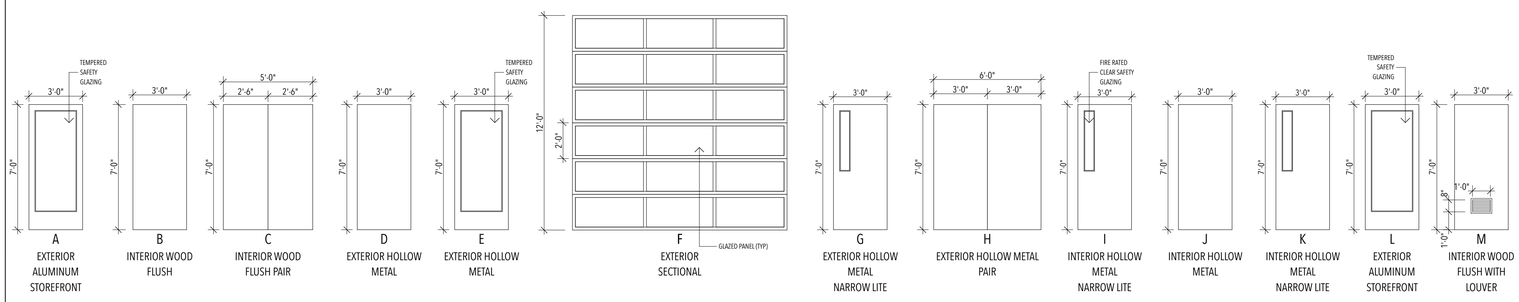
SHEET: **A101**

DATE: 25 SEPTEMBER 2023

J1 FLOOR PLAN
SCALE: 1/4" = 1'-0"



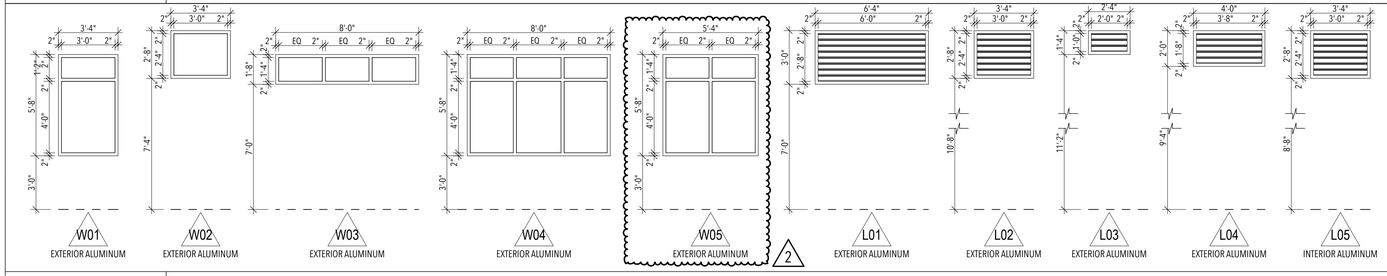
1 EXTERIOR STOREFRONT · 2 INTERIOR HOLLOW METAL · 3 INTERIOR HOLLOW METAL PAIR · 4 EXTERIOR HOLLOW METAL · 5 EXTERIOR STOREFRONT · 6 EXTERIOR HOLLOW METAL · 7 EXTERIOR HOLLOW METAL · 8 INTERIOR STOREFRONT · 9 INTERIOR HOLLOW METAL · 10 INTERIOR HOLLOW METAL · 11 EXTERIOR HOLLOW METAL (2)



A EXTERIOR ALUMINUM STOREFRONT · B INTERIOR WOOD FLUSH · C INTERIOR WOOD FLUSH PAIR · D EXTERIOR HOLLOW METAL · E EXTERIOR HOLLOW METAL · F EXTERIOR SECTIONAL · G EXTERIOR HOLLOW METAL NARROW LITE · H EXTERIOR HOLLOW METAL PAIR · I INTERIOR HOLLOW METAL NARROW LITE · J INTERIOR HOLLOW METAL · K INTERIOR HOLLOW METAL NARROW LITE · L EXTERIOR ALUMINUM STOREFRONT · M INTERIOR WOOD FLUSH WITH LOUVER

E5 DOOR & FRAME ELEVATIONS

SCALE: 1/4" = 1'-0"



W01 EXTERIOR ALUMINUM · W02 EXTERIOR ALUMINUM · W03 EXTERIOR ALUMINUM · W04 EXTERIOR ALUMINUM · W05 EXTERIOR ALUMINUM (2) · L01 EXTERIOR ALUMINUM · L02 EXTERIOR ALUMINUM · L03 EXTERIOR ALUMINUM · L04 EXTERIOR ALUMINUM · L05 INTERIOR ALUMINUM

NOTES:
1. FIELD VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO MANUFACTURE OF WINDOW SYSTEMS.
2. UNLESS OTHERWISE NOTED, ALL GLAZING SHALL BE TEMPERED SAFETY GLAZING.

G5 WINDOW & LOUVER ELEVATIONS

SCALE: 1/4" = 1'-0"

J5 DOOR SCHEDULE

SCALE: 1" = 1'-0"

DOOR SCHEDULE

NO.	SIZE W	SIZE H	TYPE	MATERIAL	GLAZING	DOOR RATING	WALL RATING	FRAME	HARDWARE GROUP	LOCATION	REMARKS
100	3'-0"	7'-0"	A	EXTERIOR STOREFRONT	FULL LITE	-	-	1	01	VESTIBULE	CR, DC, RX
101	3'-0"	7'-0"	L	INTERIOR STOREFRONT	FULL LITE	-	-	8	02	VESTIBULE	
103	3'-0"	7'-0"	B	INTERIOR WOOD	FLUSH	3/4-HR	1-HR	2	03	CORRIDOR	
104	3'-0"	7'-0"	B	INTERIOR WOOD	FLUSH	-	-	2	04	MEN	
105	3'-0"	7'-0"	B	INTERIOR WOOD	FLUSH	-	-	2	04	WOMEN	
106	3'-0"	7'-0"	B	INTERIOR WOOD	FLUSH	3/4-HR	1-HR	2	06	CORRIDOR	
106A	5'-0"	7'-0"	C	INTERIOR WOOD	FLUSH	-	-	3	05	STORAGE	
106B	3'-0"	7'-0"	D	EXTERIOR HOLLOW METAL		-	-	11	07A	MULTI-PURPOSE ROOM	DC, RX
107	3'-0"	7'-0"	B	INTERIOR WOOD	FLUSH	-	-	2	02	CORRIDOR	
108	3'-0"	7'-0"	M	INTERIOR WOOD	FLUSH	-	-	2	08	STORAGE	
109	3'-0"	7'-0"	A	EXTERIOR STOREFRONT	FULL LITE	-	-	5	01	COVERED PATIO	CR, DC, RX
113A	12'-0"	12'-0"	F	EXTERIOR OVERHEAD DOOR	-	-	-	-	-	VEHICLE BAYS	
113B	12'-0"	12'-0"	F	EXTERIOR OVERHEAD DOOR	-	-	-	-	-	VEHICLE BAYS	
113C	12'-0"	12'-0"	F	EXTERIOR OVERHEAD DOOR		-	-	-	-	VEHICLE BAYS	
113D	3'-0"	7'-0"	G	EXTERIOR HOLLOW METAL	NARROW LITE	-	-	6	09	VEHICLE BAYS	CR, DC, RX
113E	3'-0"	7'-0"	I	INTERIOR HOLLOW METAL	NARROW LITE	-	-	9	10	VEHICLE BAYS	CL, KF (2)
114	3'-0"	7'-0"	J	INTERIOR HOLLOW METAL	FLUSH	-	-	9	07	VEHICLE BAYS	CR, DC, CL
115	3'-0"	7'-0"	K	INTERIOR HOLLOW METAL	NARROW LITE	-	-	9	11	VEHICLE BAYS	
116	3'-0"	7'-0"	K	INTERIOR HOLLOW METAL	NARROW LITE	-	-	9	11	VEHICLE BAYS	
117	3'-0"	7'-0"	J	INTERIOR HOLLOW METAL	FLUSH	-	-	9	12	TELECOM.	CR, DC, RX
122	6'-0"	7'-0"	H	EXTERIOR HOLLOW METAL	FLUSH	-	-	7	13	MECHANICAL	CR, DC

DOOR SCHEDULE LEGEND:

CR = CARD READER · DC = DOOR CONTACT · KF = KERFED FRAME · CL = CIPHER LOCK · RX = REQUEST TO EXIT

NO.	DESCRIPTION	DATE
1	BID DOCUMENTS	09/25/23
2	ADDENDUM 2	10/19/23

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PAUL W. STEWART III REGISTERED ARCHITECT 11266 NORTH CAROLINA RALEIGH, N.C. 10/19/23

WAKE COUNTY
APEX MAIN EMS STATION
6950 APEX BARBECUE ROAD
APEX, NORTH CAROLINA 27502

WSA PROJECT NUMBER: 600-19-01

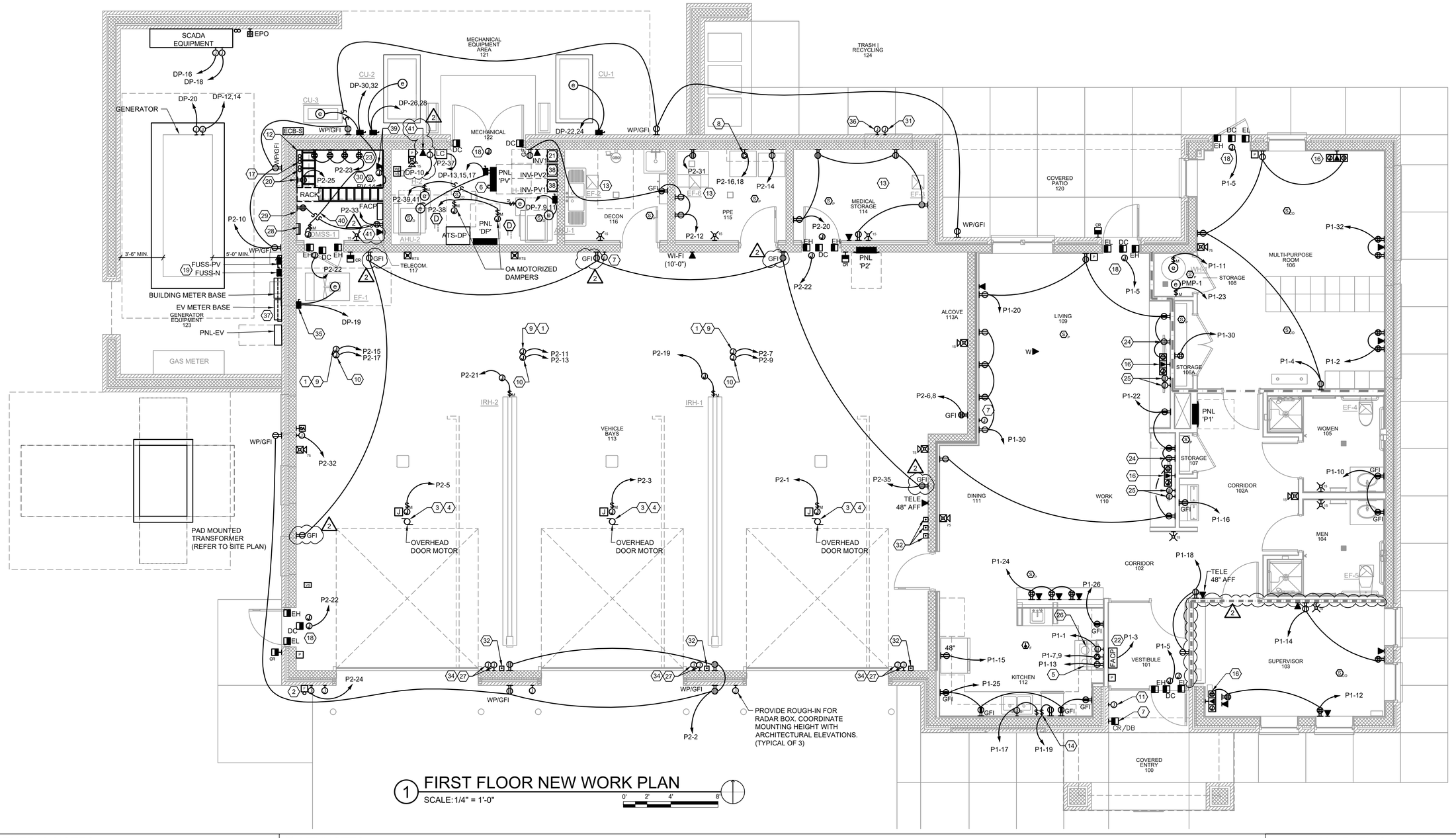
OWNER: WAKE COUNTY FACILITIES DESIGN & CONSTRUCTION

CONSTRUCTION DOCUMENTS

DRAWING TITLE: **WINDOW & DOOR SCHEDULES & ELEVATIONS**

SHEET: **A701**

DATE: 25 SEPTEMBER 2023



1 FIRST FLOOR NEW WORK PLAN

SCALE: 1/4" = 1'-0"

GENERAL NOTES:

1. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED MOUNTING HEIGHTS AND LOCATIONS FOR ALL LIGHT FIXTURES AND WALL MOUNTED DEVICES.
2. FOR ANY FIRE ALARM CIRCUIT OUTSIDE THE BUILDING, A SURGE PROTECTOR SHALL BE PROVIDED.
3. EMERGENCY LIGHTING CIRCUIT SHALL BE WIRED AHEAD OF PHOTOCELL AND WITH TRANSFER DEVICE. REFER TO ELECTRICAL DETAILS FOR WIRING DIAGRAM.
4. WHERE INACCESSIBLE CEILINGS/CAVITIES ARE SHOWN TO BE CONSTRUCTED, IE VEHICLE BAYS 113, ETC., LOCATE JUNCTION AND PULL BOXES IN ADJACENT SPACES THAT HAVE ACCESSIBLE CEILINGS TO THE GREATEST EXTENT POSSIBLE. WHERE JUNCTION AND PULL BOXES MUST BE LOCATED IN INACCESSIBLE CEILINGS/CAVITIES, PROVIDE AN ACCESS PANEL. REFER TO ARCHITECTURAL DOCUMENTS FOR ACCESS PANEL REQUIREMENTS.
5. PROVIDE COORDINATION DRAWINGS FOR MECHANICAL ROOM 122 LAYOUT WITH ALL TRADES INCLUDED BEFORE ROUGH-IN AND EQUIPMENT INSTALLATION. COORDINATE WITH MECHANICAL CONTRACTOR TO VERIFY MINIMUM MANUFACTURER RECOMMENDED SERVICE CLEARANCE.
6. REFER TO PANEL SCHEDULES FOR WIRING AND CONDUIT SIZES.
7. SEPARATE PERMITS REQUIRED FOR GENERATOR AND SOLAR PANELS. (2)

KEYNOTES:

1. PROVIDE CEILING MOUNTED TWIST LOCK TYPE RECEPTACLES. LOCATION OF RECEPTACLES SHALL BE COORDINATED WITH OWNER PRIOR TO INSTALLATION. TYPICAL EACH BAY.
2. PROVIDE 120V CONNECTION FOR SPRINKLER BELL. COORDINATE WITH FIRE PROTECTION CONTRACTOR FOR LOCATION OF SPRINKLER BELL.
3. PROVIDE JUNCTION BOX FOR ALL OVERHEAD DOOR MOTORS. COORDINATE LOCATION OF MOTORS WITH DOOR SHOP DRAWINGS PRIOR TO ROUGH-IN.
4. TYPICAL JUNCTION BOX FOR ALL OVERHEAD DOOR CONTROLS. CONTRACTOR SHALL PROVIDE 1"C FROM JUNCTION BOX TO DOOR SWITCH AND 3/4"C FROM JUNCTION BOX TO REMOTE DOOR OPENERS. REFER OVERHEAD DOOR CONTROL DETAIL ONE SHEET E403.
5. PROVIDE RECEPTACLE FOR OVER-THE-RANGE MICROWAVE. LOCATION OF MICROWAVE SHALL BE COORDINATED PRIOR TO ROUGH-IN.
6. PROVIDE MOUNTING CHANNELS FOR PANEL"PV". FOR MORE DETAIL ON CHANNELS REFER TO SHEET E406.
7. DOOR BELL BUZZER AND CARD READER SHALL BE IN A FLUSH MOUNTED BOX. EXACT LOCATION OF FLUSH MOUNTED BOX SHALL BE COORDINATED WITH SECURITY VENDOR BEFORE ROUGH-IN. ROUTE 3/4"C FROM DOORBELL TO JUNCTION BOX IN LIVING ROOM AND VEHICLE BAYS.
8. COORDINATE DRYER LOCATION AND DRYER PLUG CONFIGURATION PRIOR TO ROUGH-IN.
9. PROVIDE 3#12 SO CORD WITH PLUGS. PROVIDE 3#12 IN 3/4"C FROM 20A "SHORELINE" RECEPTACLE TO NEW 20A/1P CIRCUIT BREAKER IN PANEL "P2".
10. PROVIDE 3#10 SO CORD WITH PLUGS. PROVIDE 3#10 IN 3/4"C FROM 30A "SHORELINE" RECEPTACLE TO NEW 30A/1P CIRCUIT BREAKER IN PANEL "P2".
11. KNOX BOX LOCATION. PROVIDE 3/4"C FROM BOX TO JUNCTION BOX ABOVE ENTRY DOOR FOR MONITORING OF KNOX BOX BY SECURITY CONTRACTOR.
12. CODE SIZED WIREWAY SHALL BE PROVIDE AND MOUNTED ON WALL SECURITY SYSTEM. POWER FOR SECURITY SYSTEM SHALL BE PROVIDED AS SHOWN ON THIS SHEET. FOR SECURITY REQUIREMENTS, REFER TO SECURITY DRAWINGS.
13. REFER TO SHEET E101 FOR EXHAUST FAN CONNECTION.
14. PROVIDE 3-GANG SWITCHES FOR CONTROL OF DISPOSAL AND DISHWASHER. SWITCHES SHALL BE MOUNTED ABOVE THE COUNTER. UNDER-CABINET LIGHT SWITCH SHALL BE INSTALLED IN THIS LOCATION. REFER TO SHEET E201 FOR LIGHTING PLAN.
15. OUTLETS SHALL BE LOCATED BETWEEN LOCKERS. REFER TO ARCHITECTURAL PLANS FOR FURNITURE LOCATION.
16. PROVIDE 3-GANG RECESSED TV BOX EQUAL TO FSR PWB-100. COORDINATE LOCATION AND MOUNTING HEIGHT FOR TELEVISION BOX BEFORE ROUGH-IN.
17. PROVIDE AND STUB (3) 4" TELECOM CONDUITS AT 6" AFF INSIDE BUILDING. REFER TO SHEET E002 FOR TELECOM CONDUIT LOCATION.
18. JUNCTION BOX SUBSCRIPT REFERS TO DOOR ENTRY REQUIREMENTS NOTED ON SHEET E402. CONDUIT, JUNCTION BOXES, AND POWER SHALL BE PROVIDED AND MOUNTED ABOVE ACCESSIBLE CEILING FOR SECURITY/ACCESS CONTROL TO EACH DOOR.
19. SERVICE ENTRANCE FUSED SWITCH FOR NORMAL POWER AND PV SYSTEM. REFER RISER DIAGRAM FOR MORE INFORMATION
20. PROVIDE (2) 2" AND STUB UP APPROXIMATELY 8'-0" AFF AND MOUNT TO WALL. CONDUIT SHALL BE ROUTED FROM THE AREA ADJACENT TO SCREEN WALL NEAR GENERATOR/SCADA EQUIPMENT. CAP CONDUIT ON BOTH ENDS. QUAD RECEPTACLE ON DEDICATED CIRCUIT SHALL BE PROVIDE NEXT TO CONDUIT.
21. INVERTER SHALL BE MOUNTED ON WALL IN APPROXIMATE LOCATION. COORDINATE WITH OTHER EQUIPMENT MOUNTED INSIDE ROOM.
22. FIRE ALARM CONTROL PANEL SHALL BE RECESSED IN WALL WITH ALL CONDUITS CONCEALED.
23. COORDINATE LOCATION OF SECURITY PANEL AND CONNECTIONS WITH SECURITY CONTRACTOR. PROVIDE 1"C WITH CABLING TO SECURITY PANEL. FOR FACP TROUBLE AND SUPERVISORY, PROVIDE A CONTROL MODULE AT SECURITY PANEL.
24. PROVIDE A DUPLEX OUTLET WITHIN THE CASEWORK BELOW THE TELEVISION. COORDINATE LOCATION AND MOUNTING HEIGHT BEFORE ROUGH-IN.
25. PROVIDE TWO JUNCTION BOXES. ONE JUNCTION BOX SHALL BE LOCATED BEHIND THE TELEVISION AND THE OTHER JUNCTION BOX SHALL BE LOCATED IN THE CASEWORK BELOW. PROVIDE A 1"C TO CONNECT THE TWO JUNCTION BOXES. COORDINATE LOCATION AND MOUNTING HEIGHT BEFORE ROUGH-IN.
26. PROVIDE 120V CONNECTION FOR RANGE HOOD.
27. PROVIDE ROUGH-IN FOR OVERHEAD DOOR LIGHTS. REFER TO OVERHEAD DOOR ROUGHT-IN ON SHEET E403. COORDINATE LOCATION PRIOR TO ROUGH-IN. TYPICAL OF THREE.
28. TELECOMMUNICATIONS GROUNDING BAR.
29. PROVIDE 3/4" GRADE PLYWOOD ON ALL WALLS. PLYWOOD SHALL BE PAINTED WITH A MINIMUM OF THREE (3) COATS OF WHITE FIRE RETARDANT PAINT.
30. PROVIDE 12" LADDER RACK FROM SERVICE CONDUITS TO OVERTOP OF RACK.
31. PROVIDE A SINGLE GANG JUNCTION BOX A 10'-0" AFG FOR FUTURE SECURITY CAMERA. ROUTE 3/4"C FROM LOCATION TO SECURITY WALL IN TELECOM ROOM. CAP CONDUIT END. COORDINATE FINAL LOCATION WITH ARCHITECTURAL ELEVATIONS PRIOR TO ROUGH-IN.
32. GARAGE DOOR OPERATORS. ROUTE 3/4"C FROM LOCATION TO DOOR CONTROL BOX.
33. PROVIDE DEEP, DOUBLE GANG BOX WITH 3/4"C FROM JUNCTION BOX TO JUNCTION BOX ABOVE DOOR FOR DOOR ALARM. ROUTE 3/4"C FROM JUNCTION BOX ABOVE DOOR TO SECURITY WALL IN TELECOM ROOM.
34. PROVIDE JUNCTION BOX FOR OVERHEAD DOOR CONTROLS. ALL ROUGH-INS SHALL BE ROUTED TO THIS LOCATION. REFER TO OVERHEAD DOOR DETAIL ON SHEET E403. COORDINATE WITH OVERHEAD DOOR PROVIDER FOR LOCATION AND SIZE. TYPICAL OF THREE.
35. COORDINATE HEIGHT OF DISCONNECT SWITCH FOR EF-1 WITH THE OWNER PRIOR TO ROUGH-IN.
36. PROVIDE 120V CONNECTION TO PANEL "P2' FOR FUTURE LIGHT.
37. PROVIDE ADDITIONAL SERVICE FOR EV CHARGING STATION(S) LOCATED IN PARKING LOT. REFER TO RISER DIAGRAM FOR MORE INFORMATION ON PANEL AND FEEDER SIZES.
38. PROVIDE INVERTORS AS REQUIRED FOR PHOTOVOLTAIC PANELS LOCATED ON ROOF. REFER TO RISER DIAGRAM FOR ADDITIONAL INFORMATION.
39. PROVIDE POWER AND DATA JACK FOR OWNER FURNISHED GATEWAY COMMUNICATION DEVICE. CONFIRM FINAL ROUGH-IN LOCATION WITH OWNER AND ARCHITECT.
40. PROVIDE BRANCH CIRCUIT FROM PANEL INDICATED TO DMSS AND CONDENSING UNIT. PROVIDE 3#12 - 3/4"C TO INDOOR DMSS UNIT FROM CONDENSING UNIT.
41. FUTURE CONTROLS (OWNER). COORDINATE EXACT LOCATION AND MOUNTING HEIGHT PRIOR TO ROUGH-IN. (2)

WALL RATING LEGEND

1 HOUR RATED WALL

NO.	DESCRIPTION	DATE
1	BID DOCUMENTS	9/25/23
2	ADDENDUM #2	10/19/23

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 020601 PETER H. ANDERSEN
10/19/2023

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WAKE COUNTY

APEX MAIN EMS STATION
6950 APEX BARBECUE ROAD
APEX, NORTH CAROLINA 27502

PROJECT NUMBER: 50146007

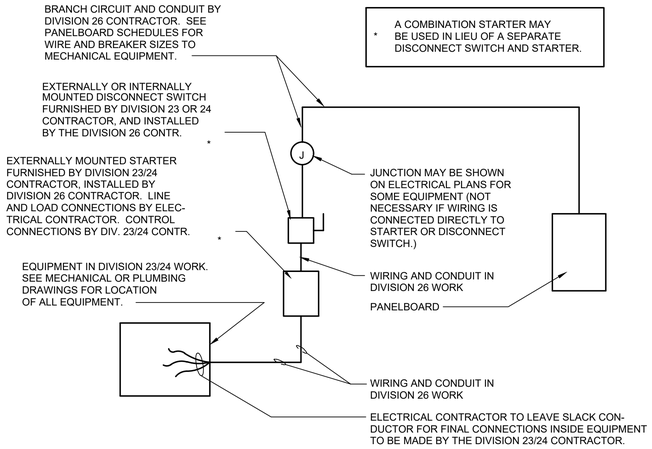
OWNER: WAKE COUNTY FACILITIES DESIGN & CONSTRUCTION

CONSTRUCTION DOCUMENTS

DRAWING TITLE:
ELECTRICAL POWER NEW WORK PLAN

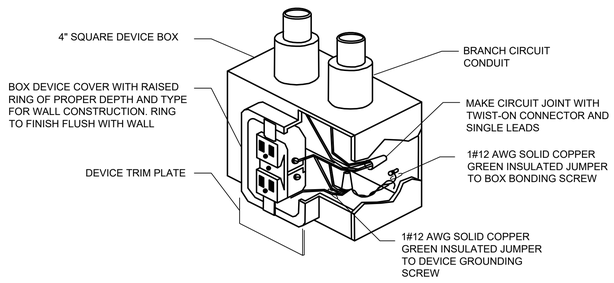
SHEET:
E102

DATE
25 SEPTEMBER 2023



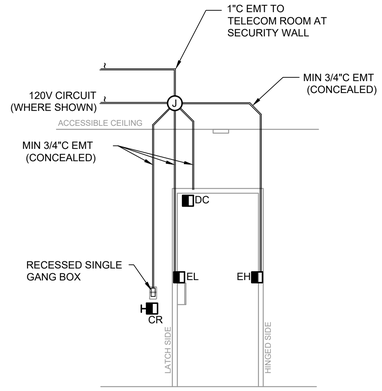
1 ELECTRICAL CONNECTION TO MECHANICAL/PLUMBING EQUIPMENT

SCALE: NTS



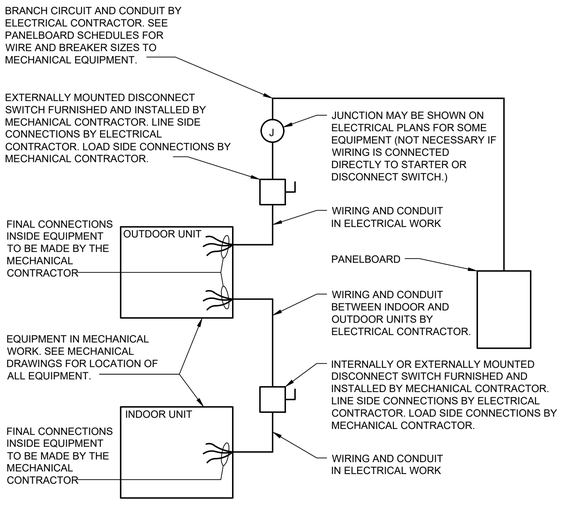
2 RECEPTACLE GROUNDING DETAIL

SCALE: NTS



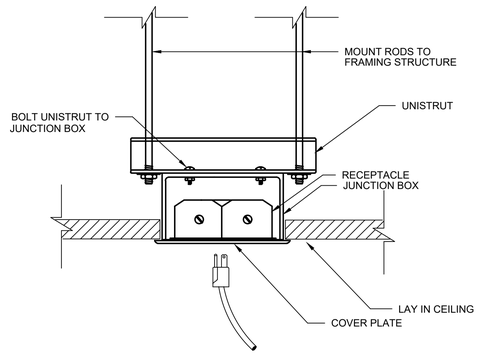
3 TYPICAL CARD ACCESS DOOR ROUGH-IN DETAIL

SCALE: NTS



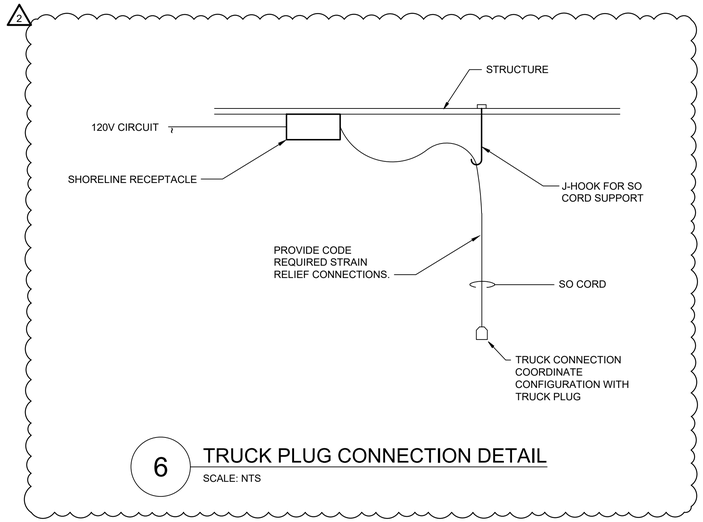
4 ELECTRICAL CONNECTION TO DMSS EQUIPMENT

SCALE: NTS



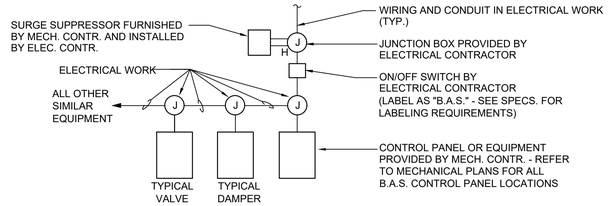
5 CEILING MOUNTED OUTLET DETAIL

SCALE: NTS



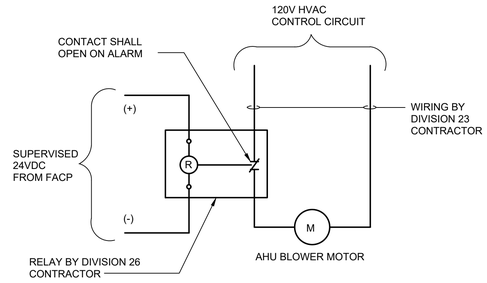
6 TRUCK PLUG CONNECTION DETAIL

SCALE: NTS



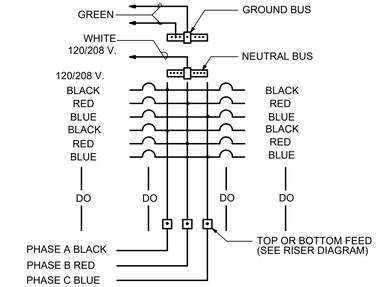
7 POWER SUPPLY TO HVAC CONTROL PANEL/EQUIPMENT

SCALE: NTS



8 TYPICAL WIRING DIAGRAM FOR AIR HANDLER SHUTDOWN

SCALE: NTS



9 WIRING COLOR CODING

SCALE: NTS

NO.	DESCRIPTION	DATE
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WAKE COUNTY

APEX MAIN EMS STATION
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APEX, NORTH CAROLINA 27502

PROJECT NUMBER: 50146007

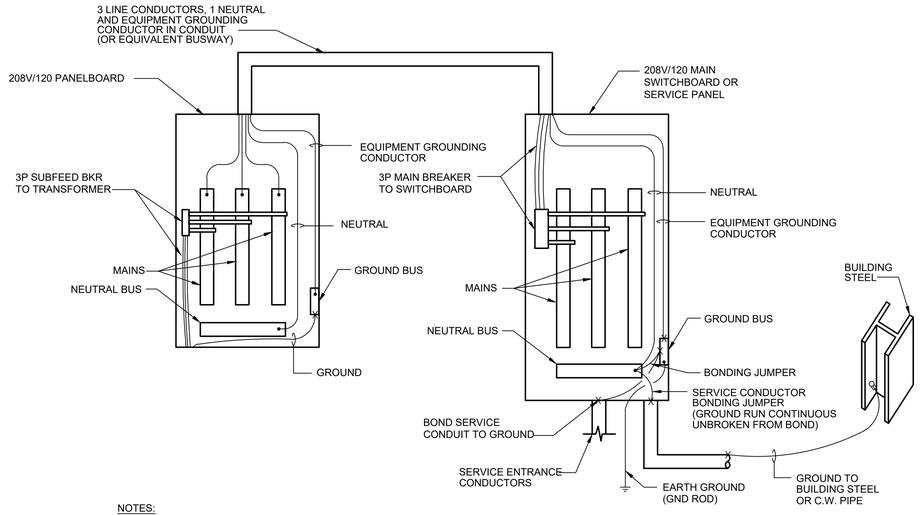
OWNER: WAKE COUNTY FACILITIES DESIGN & CONSTRUCTION

CONSTRUCTION DOCUMENTS

DRAWING TITLE:
ELECTRICAL DETAILS

SHEET:
E402

DATE
25 SEPTEMBER 2023

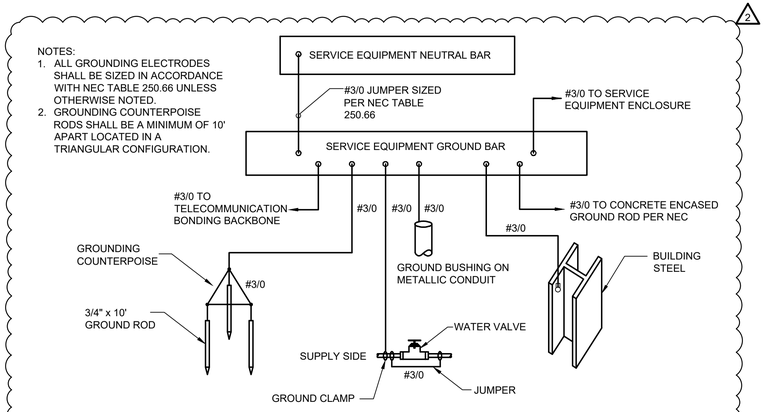


NOTES:

1. ALL CONDUCTORS, NEUTRALS, GROUNDS AND CONDUITS AS SIZED ON RISER AND PANEL SCHEDULES.
2. SYSTEM GROUND CONDUCTOR SHALL BE CONTINUOUS (UNBROKEN) AND SHALL BE RUN DIRECTLY FROM CONNECTION.

1 SYSTEM GROUND DETAIL

SCALE: NTS

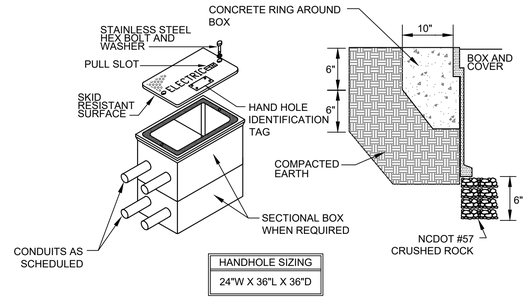


SERVICE BONDING DETAIL NOTES:

1. ALL GROUNDING CABLING IN CONDUIT. NO EXPOSED CABLING ALLOWED.

2 SERVICE BONDING DETAIL

SCALE: NTS



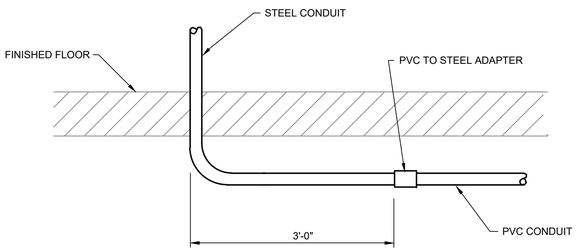
HANDHOLE SIZING
24"W X 36"L X 36"D

HAND HOLE REQUIREMENTS:

1. HOUSING SHALL BE A POLYMER CONCRETE REINFORCED WITH A HEAVY WEAVE FIBERGLASS REINFORCING WITH COMPRESSIVE STRENGTH OF NO LESS THAN 10,000 PSI.
2. COVER AND BOX SHALL WITHSTAND A SERVICE LOAD OF NO LESS THAN 15,000 LBS OVER A 10" x 10" AREA.
3. PROVIDE STAINLESS STEEL BOLTS AND INSERTS.
4. COVER LABEL SHALL READ "COMMUNICATIONS" or "ELECTRICAL".

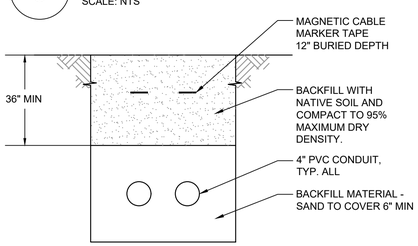
3 HAND HOLE DETAIL

SCALE: NTS



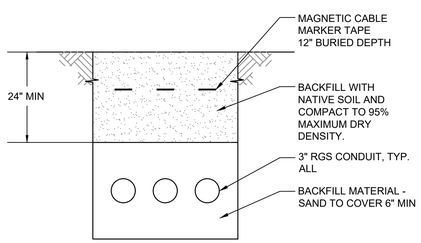
4 PVC TO STEEL CONDUIT CONVERSION DETAIL

SCALE: NTS



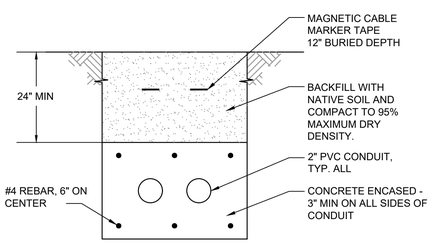
5 DUCTBANK SECTION A-A

SCALE: NTS



6 DUCTBANK SECTION B-B

SCALE: NTS



7 DUCTBANK SECTION C-C

SCALE: NTS

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WAKE COUNTY

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PROJECT NUMBER: 50146007

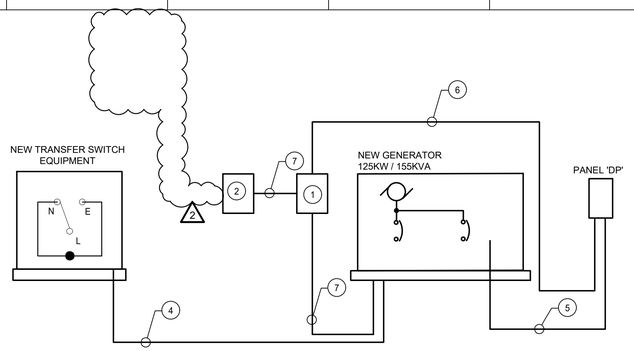
OWNER: WAKE COUNTY FACILITIES DESIGN & CONSTRUCTION

CONSTRUCTION DOCUMENTS

DRAWING TITLE: ELECTRICAL DETAILS

SHEET: E404

DATE 25 SEPTEMBER 2023



NEW WORK NOTES–SCADA SYSTEM (#)

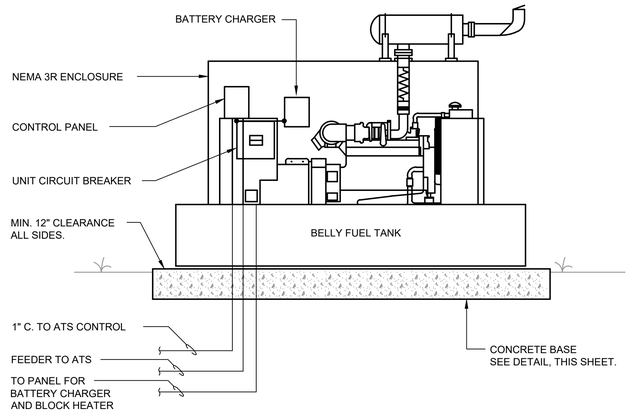
1. SCADA DEMARC PANEL.
2. SCADA RTU PANEL. (2)
3. NOT USED.
4. PROVIDE 12 #14 IN 1"C FOR
   - 4.1. 3 #14-GENERATOR CONTROLS (START STOP)
   - 4.2. 3#14- ATS INHIBIT
   - 4.3. 3#14-TRANSFER SWITCH STATUS
   - 4.4. 3#14-SPARE
5. PROVIDE POWER IN NEW TWO (2) 1"C FROM PANEL DP TO GENERATOR FOR THE FOLLOWING:
   - 5.1. GENERATOR BATTERY CHARGER
   - 5.2. GENERATOR BLOCK HEATER

   (2)
6. PROVIDE 3#12 IN 1"C FOR 120VAC SCADA POWER.
7. PROVIDE SCADA CONTROL WIRING AS FOLLOWS:
   - 7.1. PROVIDE (1 1"C (RGS) AND (1) 1 1/4"C (RGS) FOR SCADA CONTROLS WIRING. REFER TO DRAWING E-407. PROVIDE DIGITAL AND ANALOG SIGNAL WIRING AND CONNECTIONS
   - 7.2. 1-1"C-6#16 TWISTED SHIELDED PAIR
   - 7.3. 1-1/4"C-22#14 AND 8#14 SPARE

3 PARTIAL SCADA SYSTEM SCHEMATIC

SCALE: NTS

NOTE: SEPARATE PERMITS REQUIRED FOR GENERATOR AND SOLAR PANELS. (2)

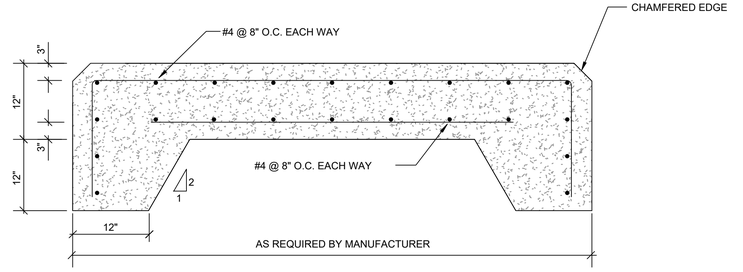


NOTES:
1. ALL CONDUIT AND SUPPORTS SHALL BE GALVANIZED.

1 GENERATOR DETAIL

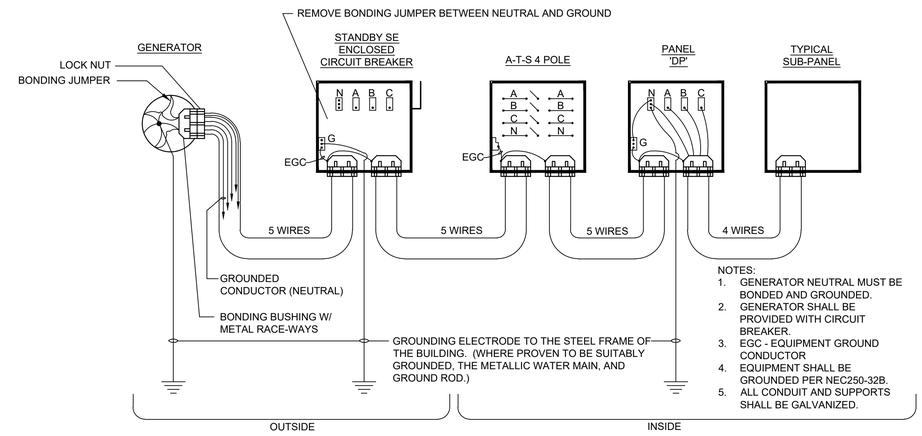
SCALE: NTS

NOTE: SEPARATE PERMITS REQUIRED FOR GENERATOR AND SOLAR PANELS. (2)



2 GENERATOR PAD DETAIL

SCALE: NTS



NOTES:
1. GENERATOR NEUTRAL MUST BE BONDED AND GROUNDED.
2. GENERATOR SHALL BE PROVIDED WITH CIRCUIT BREAKER.
3. EGC - EQUIPMENT GROUND CONDUCTOR
4. EQUIPMENT SHALL BE GROUNDED PER NEC250-32B.
5. ALL CONDUIT AND SUPPORTS SHALL BE GALVANIZED.

4 GENERATOR GROUNDING DETAIL

SCALE: NTS

NOTE: SEPARATE PERMITS REQUIRED FOR GENERATOR AND SOLAR PANELS. (2)

NOTES:
1. CHANNEL CONNECTIONS, NUTS, AND HARDWARE SHALL BE MADE BY CHANNEL MANUFACTURER.
2. EACH BASE PLATE SHALL HAVE A MINIMUM OF 4 ANCHOR BOLTS.
3. ALL MATERIAL TO BE STAINLESS STEEL.

5 TYPICAL SUPPORT FRAME DETAIL

SCALE: NTS

NO.	DESCRIPTION	DATE
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 020601 PHILIP D. ANDERSON PETER ENGINEERING DESIGN

10/19/2023

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WAKE COUNTY

APEX MAIN EMS STATION
6950 APEX BARBECUE ROAD
APEX, NORTH CAROLINA 27502

PROJECT NUMBER: 50146007

OWNER: WAKE COUNTY FACILITIES DESIGN & CONSTRUCTION

CONSTRUCTION DOCUMENTS

DRAWING TITLE:
ELECTRICAL DETAILS

SHEET:
E406

DATE
25 SEPTEMBER 2023

RTU PANEL

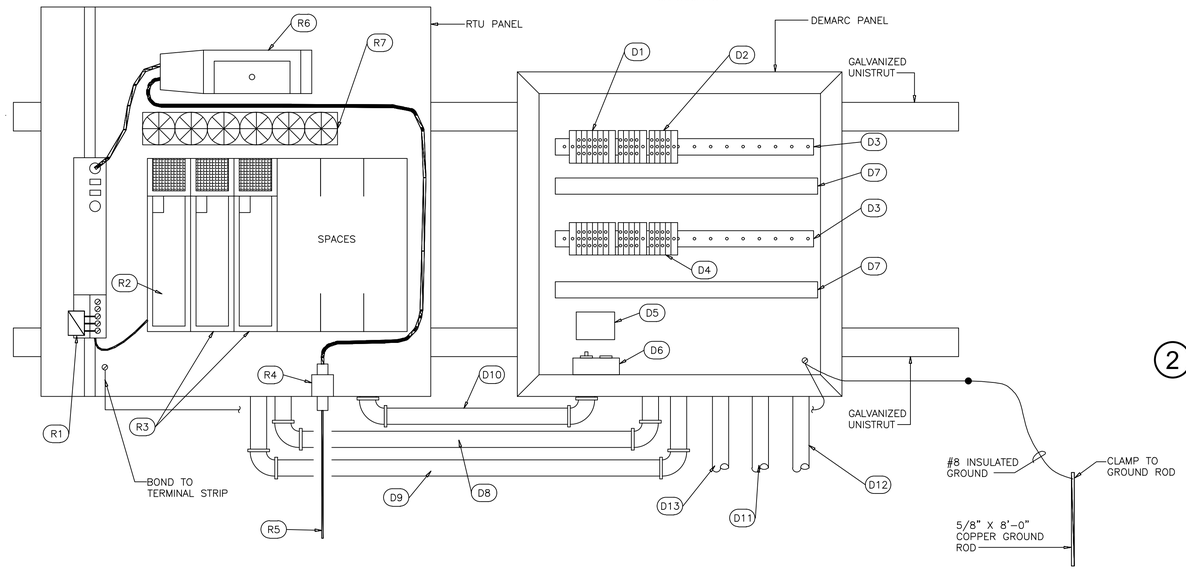
- (R1) AC PROTECTOR
- (R2) CPU
- (R3) INPUT/OUTPUT MODULES
- (R4) COAX PROTECTOR
- (R5) TO ANTENNA
- (R6) RADIO
- (R7) BATTERIES

DEMARC PANEL

- (D1) AC BREAKER OR FUSE
- (D2) IO DISTRIBUTION TERMINALS
- (D3) DIN RAIL
- (D4) INTERFACING RELAYS INPUT/OUTPUT
- (D5) POWER MODULE
- (D6) DISCONNECT SWITCH WITH RECEPTACLE
- (D7) SLOTTED WIRE DUCT
- (D8) 1 1/4" CONDUIT (DIGITAL INPUT/OUPUT)
- (D9) 1" CONDUIT (ANALOG INPUT/OUTPUT
- (D10) 3/4" CONDUIT FOR AC POWER
- (D11) 1" CONDUIT FOR ANALOG AND DRY CONTACTS
- (D12) 1 1/4" CONDUIT (DIGITAL INPUT/ OUTPUT TO GENERATOR)
- (D13) 3/4" CONDUIT FOR AC POWER

NOTES:

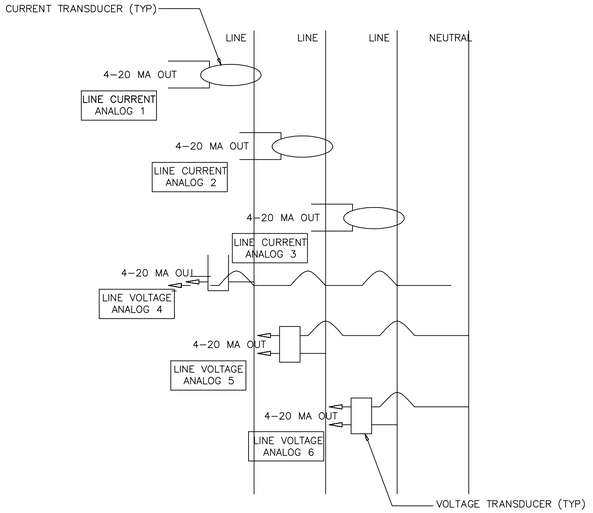
1. NOT ALL ITEMS USED AT ALL SITES. COMPONENTS ARE APPLICATION DEPENDENT.
2. BOTH CABINETS MUST BE GROUNDED.
3. SCADA SYSTEM FURNISHED AND INSTALLED BY CONTRACTOR.
4. CONTRACTOR SHALL PROVIDE ALL CONDUIT, AND WIRING FOR A COMPLETE SCADA SYSTEM INSTALLATION.
5. BOTH CABINETS MUST BE GROUNDED.
6. THE 800 MHZ RADIO INSIDE THE RTU SHALL BE PROGRAMMED BY "WIRELESS COMMUNICATIONS" ONLY.
7. ALL CONDUIT AND SUPPORTS SHALL BE GALVANIZED.



1 SCADA SITE LAYOUT WAKE COUNTY, NC

SCALE: NTS

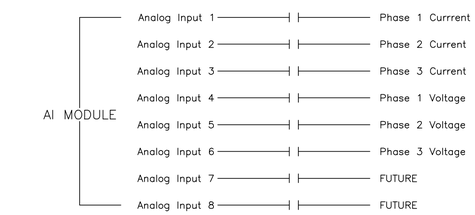
NOTE: SEPARATE PERMITS REQUIRED FOR GENERATOR AND SOLAR PANELS.



NOTE: INSTALLED IN GENERATOR

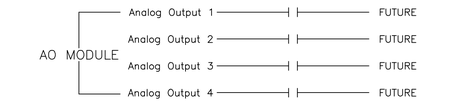
2 THREE PHASE POWER MONITORING FOR SCADA INPUTS

SCALE: NTS



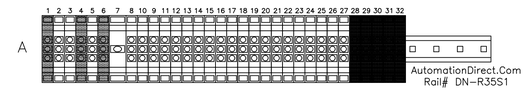
3 GENERATOR ANALOG INPUT POINTS THREE PHASE POWER

SCALE: NTS

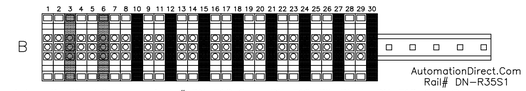


4 GENERATOR ANALOG OUTPUT POINTS THREE PHASE POWER

SCALE: NTS

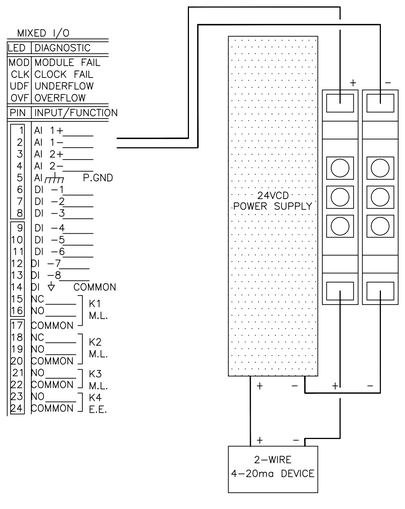


AutomationDirect.Com Terminal # DN-T10 Gray, DN-T10-Blk Black, DN-T10-GRN Green



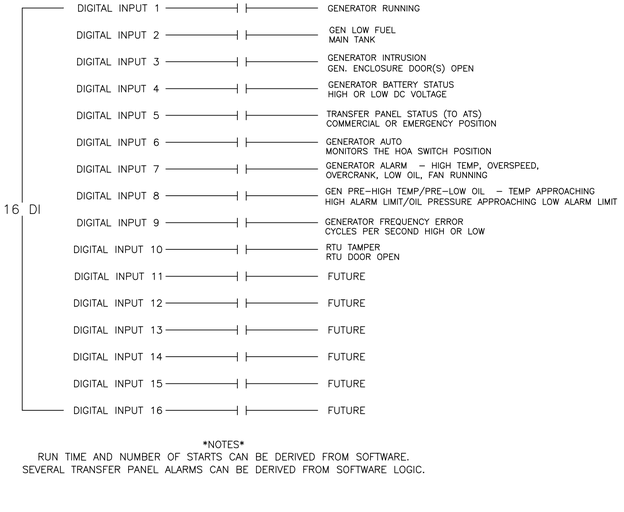
AutomationDirect.Com Terminal # DN-T10 Gray, DN-T10-Blk Black, DN-T10-GRN Green

A		B	
1.	AC Hot	1.	Phase 1 Current
2.	AC Neutral	2.	Phase 1 Current
3.	AC Ground	3.	Signal Ground
4.	AC Hot	4.	Phase 2 Current
5.	AC Neutral	5.	Phase 2 Current
6.	AC Ground	6.	Signal Ground
7.	RTU Fuse	7.	Phase 3 Current
8.	Generator Running	8.	Phase 3 Current
9.	Generator Low Fuel	9.	Signal Ground
10.	Generator Intrusion	10.	Phase 1 Voltage
11.	Generator Battery Status	11.	Phase 1 Voltage
12.	Transfer Panel Status	12.	Signal Ground
13.	General Auto	13.	Phase 2 Voltage
14.	General Alarm	14.	Phase 2 Voltage
15.	Gen Pre-High Temp/Pre-Low Oil	15.	Signal Ground
16.	Generator Frequency Error	16.	Phase 3 Voltage
17.	RTU Tamper	17.	Phase 3 Voltage
18.		18.	Signal Ground
19.		19.	
20.		20.	
21.		21.	
22.		22.	
23.		23.	
24.		24.	
25.		25.	
26.		26.	
27.		27.	
28.	Input Common	28.	
29.	Input Common	29.	
30.	Input Common	30.	
31.	Input Common	31.	
32.	Input Common	32.	



5 TYPICAL ANALOG INPUT WIRING

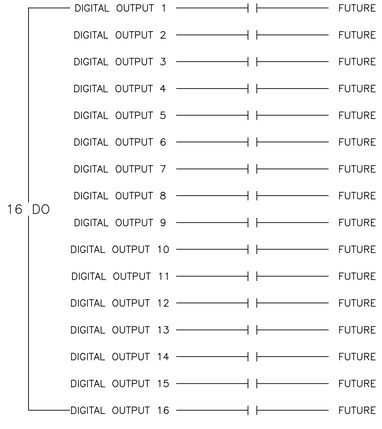
SCALE: NTS



NOTES
RUN TIME AND NUMBER OF STARTS CAN BE DERIVED FROM SOFTWARE.
SEVERAL TRANSFER PANEL ALARMS CAN BE DERIVED FROM SOFTWARE LOGIC.

6 GENERATOR/ATS DIGITAL INPUT POINTS

SCALE: NTS



NOTES
RUN TIME AND NUMBER OF STARTS CAN BE DERIVED FROM SOFTWARE.
SEVERAL TRANSFER PANEL ALARMS CAN BE DERIVED FROM SOFTWARE LOGIC.

7 GENERATOR ANALOG OUTPUT POINTS THREE PHASE POWER

SCALE: NTS

8 WAKE COUNTY GENERATOR SITE DEMARC CONNECTIONS THREE PHASE POWER

SCALE: NTS

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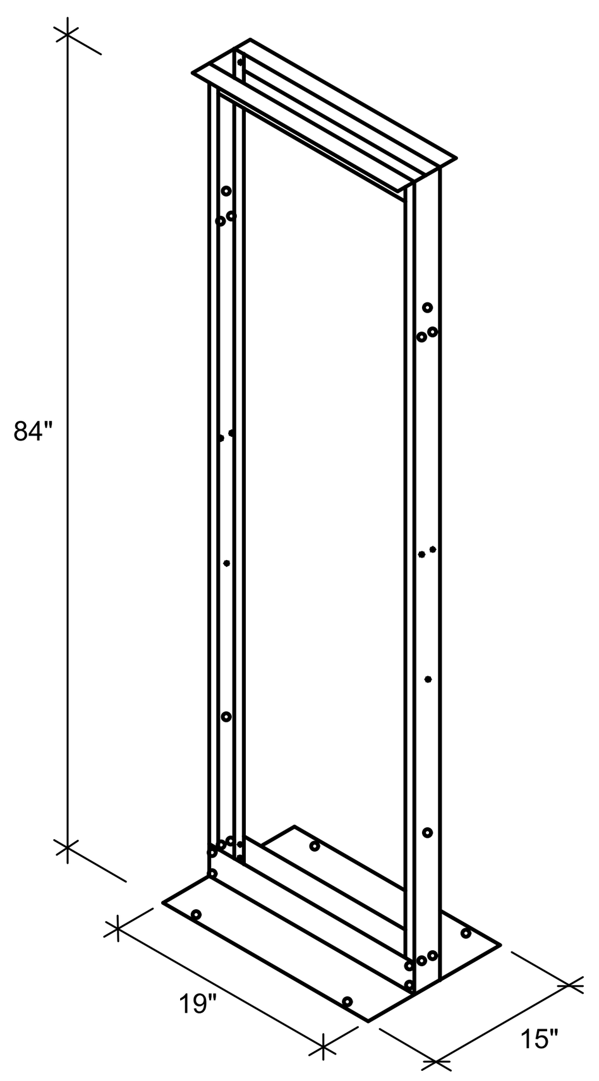


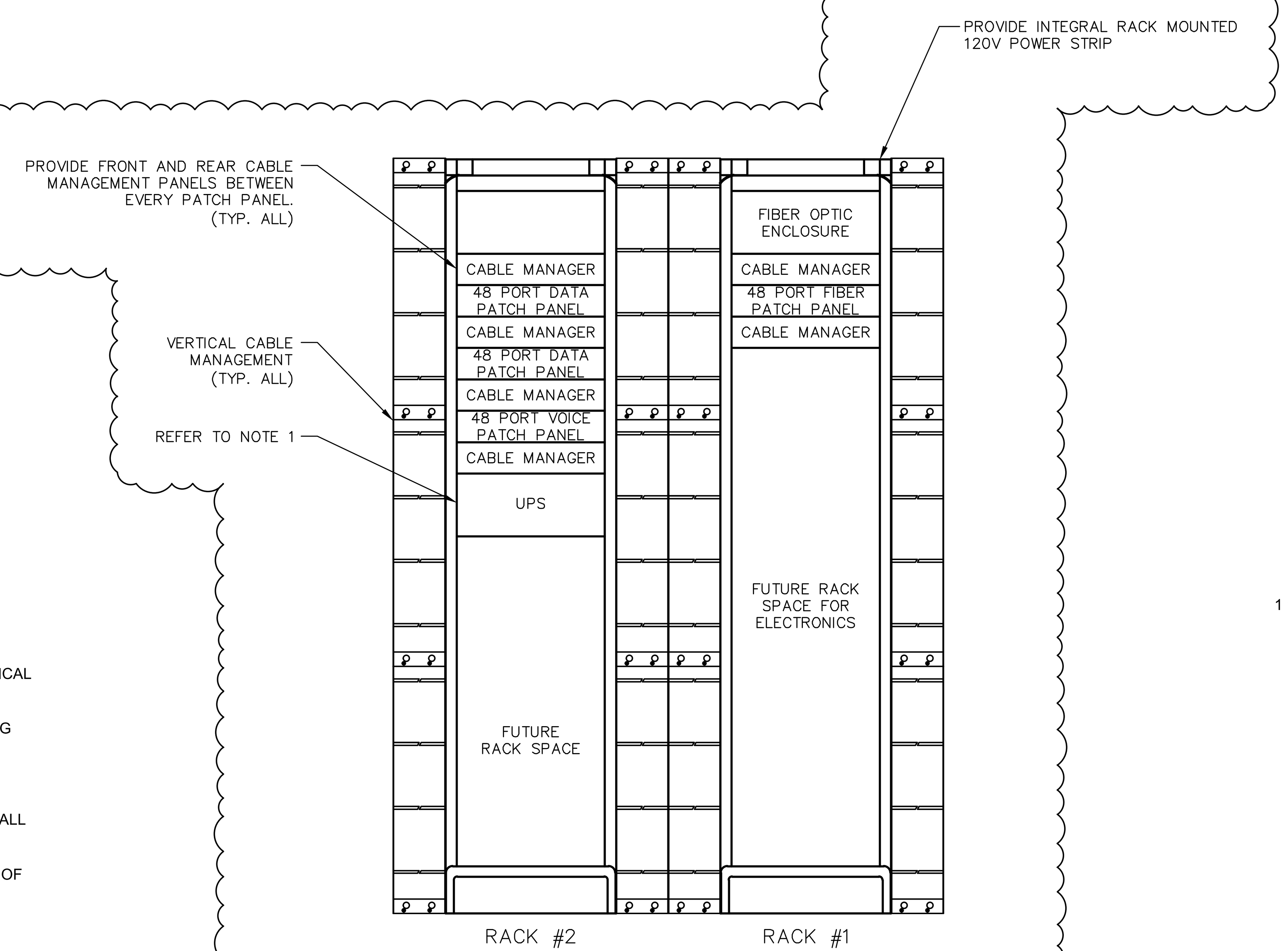
TELECOM EQUIPMENT RACK NOTES:

1. ALL MATERIALS SHALL BE CONTRACTOR FURNISHED AND INSTALLED UNLESS OTHERWISE SPECIFICALLY NOTED.
2. UNIT SHALL BE HIGH STRENGTH 6061-T6 ALUMINUM CONSTRUCTION. UNIT TO BE SELF-SUPPORTING AND RATED FOR 1000 LB LOAD CAPACITY.
3. UNIT TO HAVE EIA #12-24 ALTERNATING HOLE PATTERNS ON BOTH SIDES OF VERTICAL POSTS.
4. PROVIDE WEB CHANNEL HOLES AS SHOWN TO FACILITATE SIDE-BY-SIDE MOUNTING ATTACHMENT.
5. PROVIDE BLACK POWDER COAT FINISH OVER SURFACE TO INHIBIT OXIDATION.
6. UNIT TO BE MOUNTED IN POSITION AS SHOWN ON PLANS. SPACE RACK 6" FROM WALL TO ACCOMMODATE VERTICAL WIRE MANAGEMENT.
7. BOLT BASE SECURELY TO FLOOR. PROVIDE MOUNTING BRACKET TO SECURE TOP OF RACK TO WALL.
8. HORIZONTAL WIRE MANAGEMENT PANELS SHALL BE INSTALLED BETWEEN EVERY FIBER TRAY AND PATCH PANEL ON FRONT AND BACK OF RACK.
9. VERTICAL WIRE MANAGEMENT PANELS SHALL BE INSTALLED THE FULL LENGTH ON BOTH SIDES OF RACK.
10. OWNER ITS TO SUPPLY AND INSTALL ALL ELECTRONIC EQUIPMENT.
11. COORDINATE WITH WTCC ITS FOR FINAL LAYOUT OF RACK EQUIPMENT PRIOR TO BEGINNING WORK.
12. ALL GROUNDING CABLING IN CONDUIT. NO EXPOSED CABLING ALLOWED.

1 TELECOM EQUIPMENT RACK DETAIL

SCALE: NTS

2

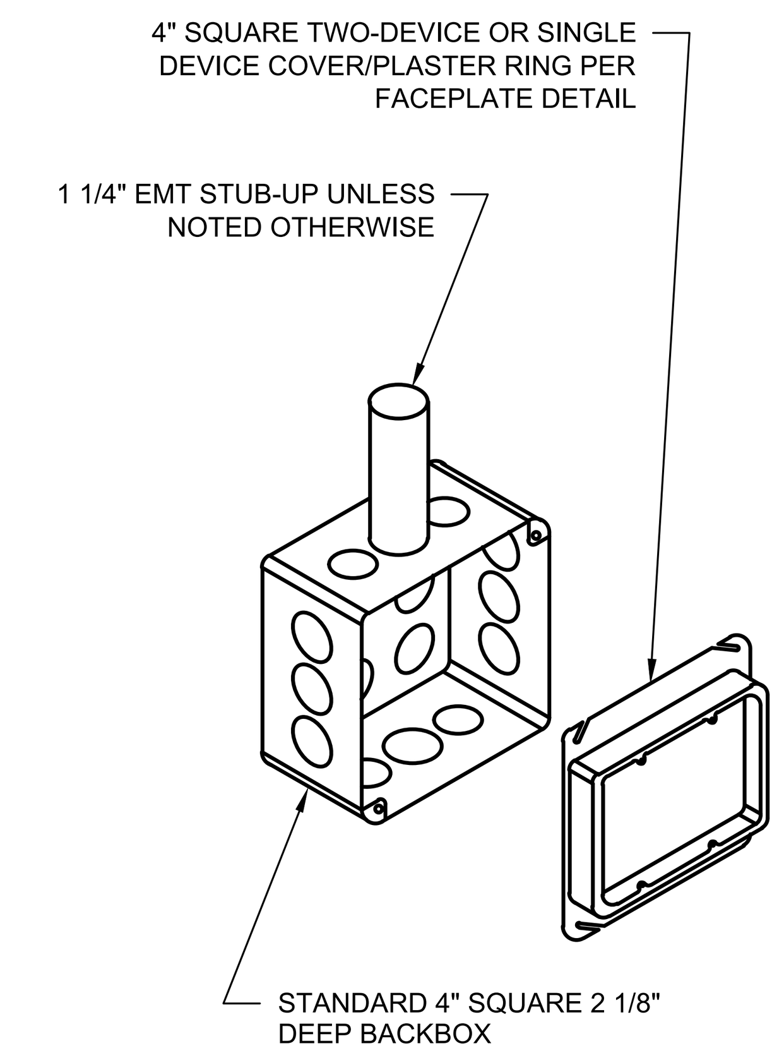


TELECOM EQUIPMENT RACK NOTES:

1. PROVIDE UPS WITH BACNET CARD. BASIS OF DESIGN SHALL BE VERTIV LIEBERT (#GXT5-20000LVRT2UXL) 2000VA RACK-MOUNTED UPS WITH VERTIV SNMP WEBCARD (#RDU101) FOR COMMS WITH EVRN SUPPORT AND RACK MOUNT KIT (#2UTELECOMRKI).

2 TELECOM EQUIPMENT RACK ELEVATION

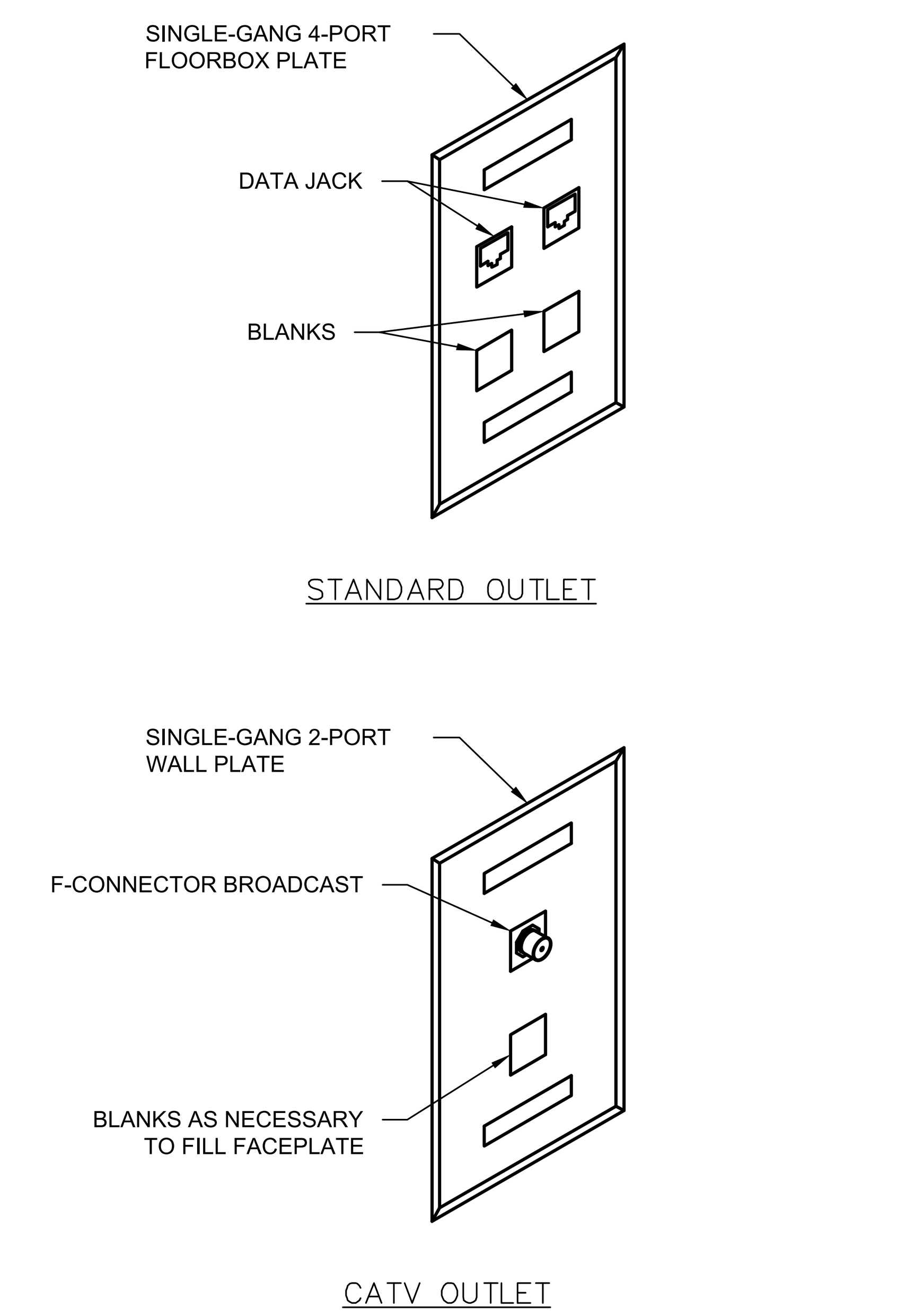
SCALE: NTS



3 TELECOM OUTLET BOX DETAIL

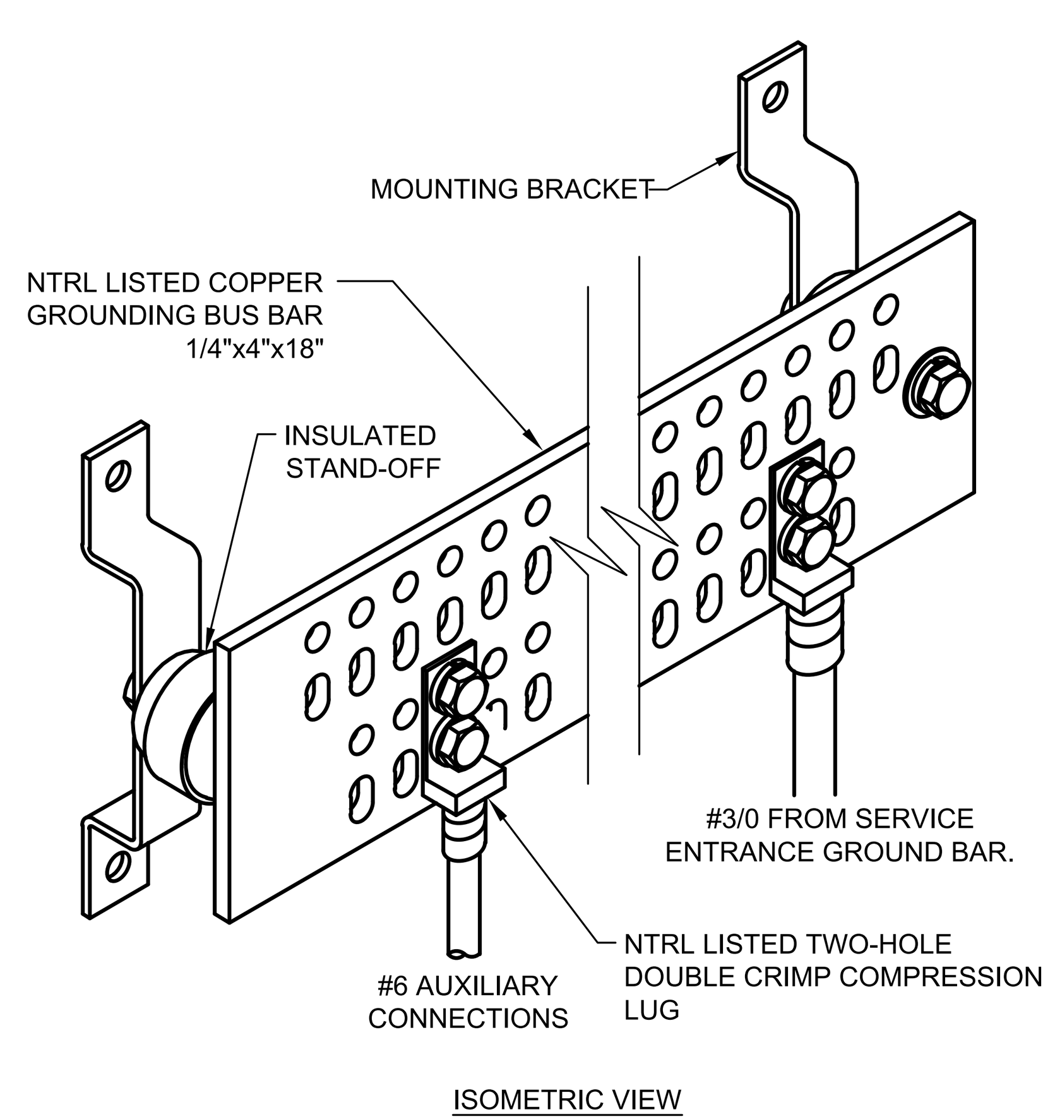
SCALE: NTS

2



4 TYPICAL TELECOM FACEPLATE DETAIL

SCALE: NTS

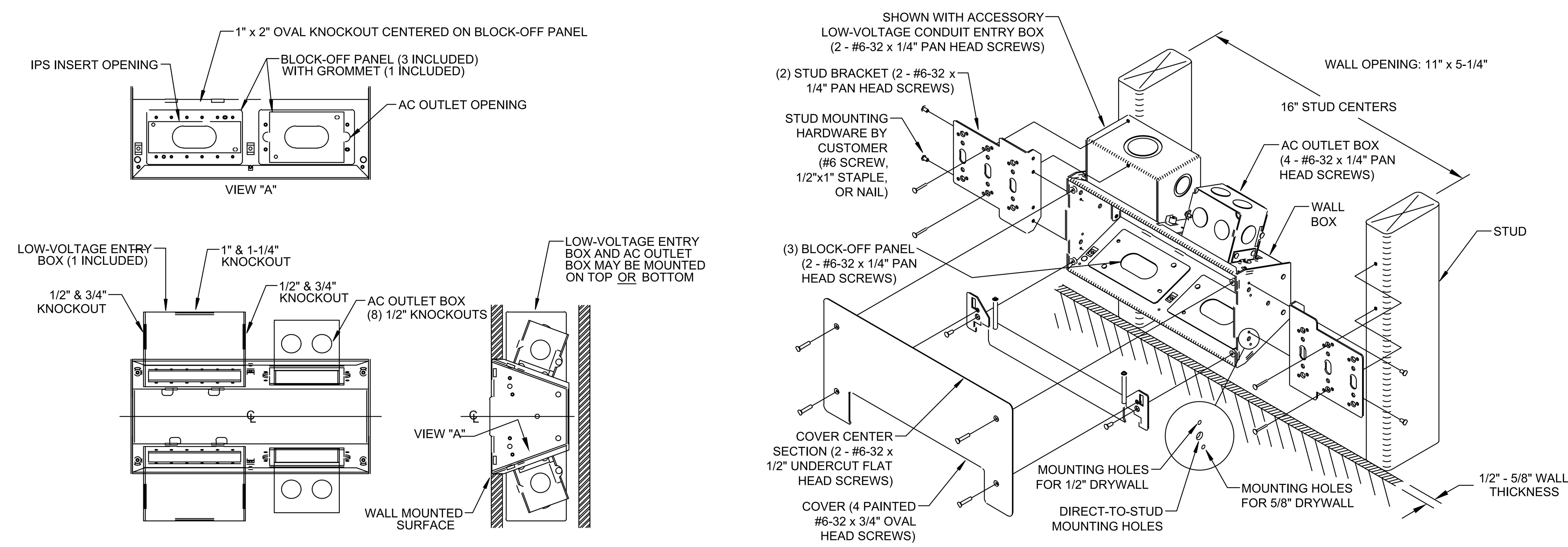


TELECOM GROUNDING BUSBAR NOTES:

1. ALL GROUNDING CABLING IN CONDUIT. NO EXPOSED CABLING ALLOWED.
2. LABEL EACH BAR CONNECTION.

5 TELECOMMUNICATION GROUNDING BUSBAR

SCALE: NTS



6 FLAT PANEL DISPLAY WALL BOX

SCALE: NTS

FLAT DISPLAY WALL BOX NOTES:

1. COORDINATE FINAL MOUNTING HEIGHT AND LOCATIONS WITH ARCHITECTURAL ELEVATIONS.
2. DEVICE SHALL BE MOUNTED CENTERED BEHIND FLAT PANEL MONITOR.
3. BASIS OF DESIGN: FSR 'PWR-100'

NO.	DESCRIPTION	DATE
1	BID DOCUMENTS	9/25/23
2	ADDENDUM #2	10/19/23

NORTH CAROLINA PROFESSIONAL SEAL 020601 ENGINEER PETER O. ANDERSEN
10/19/2023

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williardstewartarchitects.com

WAKE COUNTY
APEX MAIN EMS STATION
6950 APEX BARBECUE ROAD
APEX, NORTH CAROLINA 27502

PROJECT NUMBER: 50146007

OWNER: WAKE COUNTY FACILITIES DESIGN & CONSTRUCTION

CONSTRUCTION DOCUMENTS

DRAWING TITLE: ELECTRICAL DETAILS

SHEET: E408

DATE 25 SEPTEMBER 2023

EV - LOAD SUMMARY

		CONNECTED	DEMAND
LIGHTING	---------	0.0 KVA	0.0 KVA
RECEPTACLES	---------	0.0 KVA	0.0 KVA
LARGEST MOTOR	---------	0.0 KVA	0.0 KVA
MOTORS & HVAC EQUIP	---------	0.0 KVA	0.0 KVA
WATER HEATER	---------	0.0 KVA	0.0 KVA
MISC. EQUIPMENT	---------	14.0 KVA	14.0 KVA
TOTAL ON PANELBOARD		14.0 KVA	14.0 KVA
EV DEMAND CURRENT	-------	39 AMPS @ 208Y/120V	
EV DEMAND FACTOR	-------	1.00%	

BUILDING - LOAD SUMMARY

		CONNECTED	DEMAND
LIGHTING	---------	3.5 KVA	4.4 KVA
RECEPTACLES	---------	14.2 KVA	12.1 KVA
LARGEST MOTOR	---------	5.4 KVA	6.8 KVA
MOTORS & HVAC EQUIP	---------	24.8 KVA	24.8 KVA
WATER HEATER	---------	0.5 KVA	0.6 KVA
MISC. EQUIPMENT	---------	44.5 KVA	44.5 KVA
TOTAL ON PANELBOARD		92.9 KVA	93.2 KVA
BUILDING DEMAND CURRENT	-------	240 AMPS @ 208Y/120V	
BUILDING DEMAND FACTOR	-------	1.00%	

ELECTRICAL RISER FEEDER SCHEDULE

FEEDER TAG	AMPACITY (1)	COPPER FEEDER SIZE (2,3)	NOTES
THREE PHASE, NEUTRAL & EQUIPMENT GROUND			
60Y	60	3#6, #8G, 1-1/4"C	
125Y	130	3#1, 1#1N, 1#6G IN 1-1/2"C	-
150Y	150	3#1/0, 1#1/0N & 1#6G IN 2"C	-
225Y	230	4#4/0, 1#4G, IN 2-1/2"C	-
400Y	400	2 SETS OF 3#3/0, 1#3/0N & 1#3G IN 2"C EACH SET	-
THREE PHASE & GROUNDED NEUTRAL (SE)			
225SE	230	3#4/0, 1#4/0GN IN 2"C	-
400SE	400	2 SETS OF 3#3/0, 1#3/0GN IN 2"C EACH SET	-
600SE	600	2 SETS OF 3#350KCMIL, 1#350KCMIL GN IN 3"C EACH SET	
GENERAL NOTES			
GN-1	AMPACITY LISTED IS BASED ON NEC TABLE 310.15(B)(16) AND THE 75°C RATING COLUMN UNLESS LIMITED BY EQUIPMENT GROUNDING CONDUCTOR PER NEC TABLE 250.122. IF TERMINALS OR SPLICES RATED LESS THAN 75°C ARE ENCOUNTERED CONTRACTOR SHALL RESIZE PHASE CONDUCTOR AND EQUIPMENT GROUND ACCORDINGLY.		
GN-2	(2) IF PHASE CONDUCTORS ARE INCREASED ABOVE SIZE LISTED FOR ANY REASON, THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE INCREASED PROPORTIONALLY BASED ON CIRCULAR MIL AREA PER NEC 250.122(B).		
GN-3	(3) CONDUIT SIZE IS BASED ON THHN/THWN CONDUCTORS IN EMT. CONTRACTOR SHALL ADJUST CONDUIT SIZE PER NEC CHAPTER 9, TABLE 1.		

GENERAL NOTES:

1. REFER TO SERVICE BONDING DETAIL AND TYPICAL BONDING AND GROUNDING DETAIL, SHEET E404.
2. PROVIDE LABELING OF ALL PV RELATED CONDUIT AS REQUIRED BY NEC 690.
3. SOLAR PV SYSTEM SHALL CONFORM TO THE TOWN OF APEX PERMITTING REQUIREMENTS.
4. PV SOLAR STRING SIZE: 49 PANELS AT 480W = 23.5kW DC; 28.8kVA AC.
5. CONTRACTOR SHALL COORDINATE ALL UTILITY REQUIREMENTS AND PERMITTING FOR SOLAR PV INSTALLATION, PROVIDE AND OBTAIN THE NET-METERING UTILITY SERVICE AGREEMENT ON BEHALF OF CLIENT, AND PAY ANY UTILITY FEES ASSOCIATED WITH THE NET-METER AGREEMENT.

KEY NOTES:

1. PROVIDE SCADA SYSTEM, SCADA SYSTEM ANTENNA AND SUPPORT FRAME FOR SCADA SYSTEM. REFER TO SHEET E406 - E407 AND E47 FOR SPECIFICATIONS AND INFORMATION.
2. REFER TO DETAIL ON SHEET E406 FOR ADDITIONAL WIRING INFORMATION.
3. PROVIDE 4#12 WIRE IN 1"C FOR BLOCK HEATER. PROVIDE 3#12 FOR BATTERY CHARGER IN 1"C FROM GENERATOR TO NEW PANEL "DP". REFER TO PANEL SCHEDULE ON SHEET E601.
4. CONTRACTOR SHALL PROVIDE PAD FOR TOWN OF APEX UTILITY CO-OP TRANSFORMER. COORDINATE WITH TOWN OF APEX UTILITY CO-OP FOR THEIR GUIDELINES FOR TRANSFORMER PADS.
5. PROVIDE PLACARD AT SERVICE ENTRANCE DISCONNECT INDICATING MAXIMUM FAULT CURRENT AND DATE OF CALCULATION PER NEC 110.24. MAXIMUM FAULT CURRENT SHALL BE COORDINATED WITH UTILITY AND PLACARD INSTALLED PRIOR TO ENERGIZATION. PLACARD SHALL INCLUDE TYPE AND LOCATION OF ONSITE OPTIONAL STAND-BY POWER SOURCE PER NEC 701.7.
6. PROVIDE LIGHTING INVERTER SIZED FOR A MINIMUM OF 150% OF THE EMERGENCY LIGHTING LOAD.
7. PROVIDE 19kVADC/14.4 kVAAC 3-PHASE INVERTER WITH RAPID SHUTDOWN AND DC DISCONNECT. TYPICAL OF TWO (2).
8. REMOVE N-G BOND IN SE RATED DISCONNECT. BOND GROUND BUS TO GEC.
9. COORDINATE NET-METER REQUIREMENTS WITH UTILITY COMPANY.
10. PROVIDE CONTROL AND COMMUNICATION GATEWAY, WHERE MULTIPLE INVERTORS ARE PROVIDED, DAISY-CHAIN AND CONNECT TO GATEWAY. CONNECT GATEWAY TO NETWORK. PROVIDE ENCLOSURE FOR GATEWAY AND MOUNT IN TELECOM ROOM. CONFIRM WITH OWNER AND ARCHITECT BEFORE ROUGHING IN FINAL LOCATION.

Solar Photovoltaic (PV) System Notes:

Base Bid: The Base Bid Project Scope (If Alternate E–1 is Not Accepted) is to Provide the Infrastructure for a PV–Ready Building Which Shall Include the PV Service Disconnect and Its Primary Wiring Connected to the Exterior Mounted NEMA 3R Wiring Trough Shown on Electric Power Riser Detail 1/E501.

Alternate E–1: Provide the Entire Photovoltaic (PV) System including the PV Solar Panels, Power Optimizers, Combiners, Wiring Connectors, PV Inverters "INV–PV1 & INV–PV2", Panel 'PV', RTU Communications, Cabling and Conduit, Testing, Training, Operations & Maintenance Manuals and Closeout Documents, etc. (All System Equipment Upstream of PV Service Disconnect). Refer to Alternate E–1A for Owner Preferred Alternate Associated with Alternate E–1.

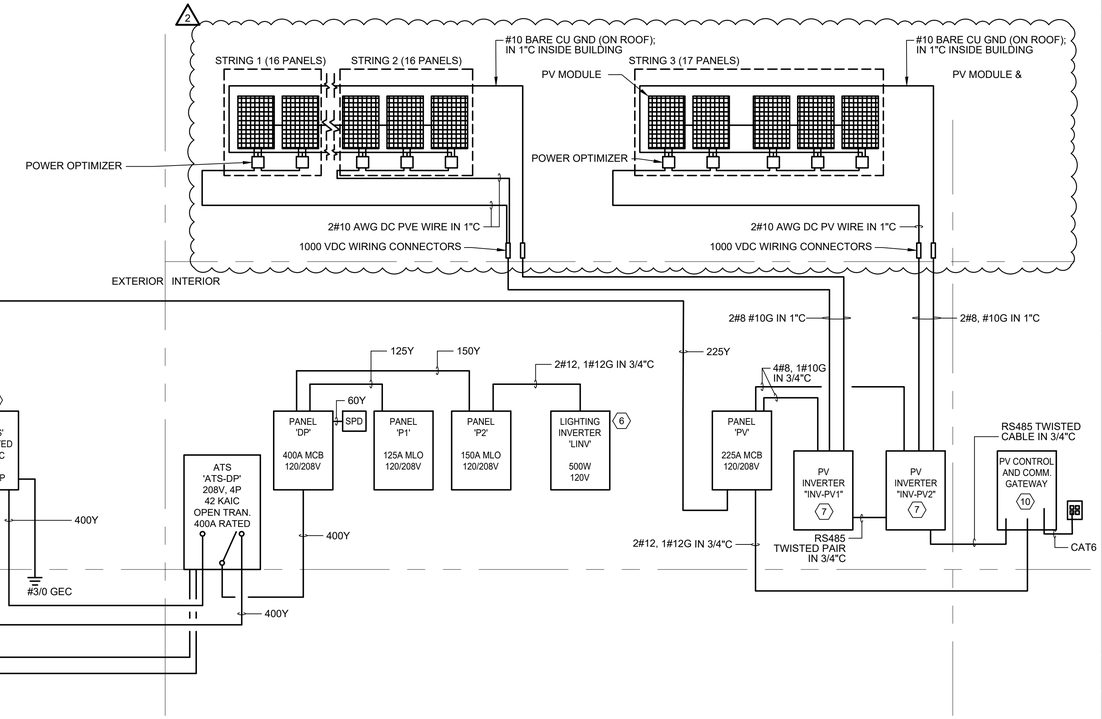
Alternate E–1A: Provide Owner Preferred Alternate for All Solar Photovoltaic Equipment and Start–Up Services, Including, But Not Limited to: Solar Photovoltaic Panels, Power Optimizers, Combiners, and Inverters with SolarEdge Technologies, Inc. Being the Owner's Preferred Manufacturer."

Electric Vehicle (EV) Charging System Notes:

Base Bid: The Base Bid Project Scope (If Alternate E–2 is Not Accepted) is to Provide the Infrastructure for an EV–Ready Building and Site Which Shall Include the EV Service Meter Base and Its Primary Wiring as well as the EV Underground Empty 1" Conduit Branch Circuits (Stubbed Out and Capped at Both Ends) (with Pull Strings) from the EV Panelboard Location to the EVSE Charging Location.

Alternate E–2: Provide the Entire Electric Vehicle (EV) Charging System including the EV Chargers, Cable and Conduit, EV Panelboard 'EV', Testing, Training, Operations & Maintenance Manuals and Closeout Documents, etc. (All System Equipment Upstream to the EV Service Meter Base).

Alternate E–2A: Provide Owner Preferred Alternate for All Electric Vehicle (EV) Charging Equipment and Startup Services with ChargePoint, Inc. Being the Owner's Preferred Manufacturer."



1 ELECTRICAL POWER RISER
SCALE: NTS

NO.	DESCRIPTION	DATE
1	BID DOCUMENTS	9/25/23
2	ADDENDUM #2	10/19/23

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 020601 Robert D. Anderson 10/19/2023

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WAKE COUNTY

APEX MAIN EMS STATION
6950 APEX BARBECUE ROAD
APEX, NORTH CAROLINA 27502

PROJECT NUMBER: 50146007

OWNER: WAKE COUNTY FACILITIES DESIGN & CONSTRUCTION

CONSTRUCTION DOCUMENTS

DRAWING TITLE: ELECTRICAL POWER RISER

SHEET: E501

DATE: 25 SEPTEMBER 2023

NEW PANEL DP — NEW WORK

CKT	LOAD VA	DESCRIPTION	CIRCUIT BREAKER NOTE	FUNCTION	TRIP	PHASE A	B	C	CIRCUIT BREAKER TRIP	FUNCTION	NOTE	DESCRIPTION	LOAD VA	CKT
1	11178	PANEL P1				21383						PANEL P2	10305	2
3	9180	SEE RISER		LSIG	125		21494		150	LSIG		SEE RISER	12314	4
5	6312							20507					14195	6
7	580	AHU-1 (1 HP)				830			20				250	8
9	580	3#12, 1#12G - 3/4"C			15		1080		20			FUTURE CONTROLS OWNER)	500	10
11	580							1830	20			GENERATOR HEATER	1250	12
13	580	AHU-2 (1 HP)				1830			20			SEE RISER	1250	14
15	580	3#12, 1#12G - 3/4"C			15		1580		20			SCADA	1000	16
17	580							1580	20			SCADA	1000	18
19	1180	EF-1 (0.5 HP)			20	2180			20			BATTERY CHARGER, SEE RISER	1000	20
21	0	SPARE			20		1414		25			CU-1	1414	22
23	0	SPARE			20			1414				2#10, 1#10G - 3/4"C	1414	24
25	0				60	1997			40			CU-2	1997	26
27	0	SPD					1997					2#8, 1#10G - 3/4"C	1997	28
29	0	SEE RISER						998	15			CU-3/DMSS-1	998	30
31	0	SPARE			20	998						2#12, 1#12G - 3/4"C	998	32
33	0	SPARE			20		0					SPACE	0	34
35	0	SPARE			30			0				SPACE	0	36
37	0					0						SPACE	0	38
39	0	SPARE			20		0					SPACE	0	40
41	0							0				SPACE	0	42

LOAD TYPE	CONNECTED		DEMAND	
EXISTING	0	125%	0	
RECEPTACLES	14640	83%	12470	
MOTOR	13856	100%	13856	
LARGEST MOTOR	1740	125%	2175	
HVAC	16163	100%	16163	
LIGHTING	5074	125%	6343	
KITCHEN	0	100%	0	
OTHER	31320	100%	31320	
TOTAL	83113	99%	82347	

208Y/120 V; 3 PHASE; 4 WIRE; 22 KAIC; YES SE LABEL
225 BUS RATING; MLO MAINS TYPE; 400 MCB RATING; LSIG TRIP UNIT

FED FROM: P/NL DP
MOUNT: SURFACE
NEMA: 1
MAN / MODEL #:
PROVIDE DOOR WITH LOCK AND HINGED TRIM. PROVIDE COPPER BUSS BARS AND BOLT ON BREAKERS.

NOTES:
1.
2.
3.
4.

FUNCTIONS AND ABBREVIATIONS

AFCB: ARC FAULT CB; CB: CIRCUIT BREAKER; EX: EXISTING; GFEP: GND FAULT CB (30ma/100mA); GFCB: GND FAULT CB (6mA); ARMS: ARC FLASH REDUCTION MAINTENANCE SWITCH
SFCB: SUBFEED CB; SFL: SUBFEED LUGS; SR: SEE RISER; ST: SHUNT TRIP; UV: UNDERVOLTAGE TRIP
L: LONG TIME; S: SHORT TIME; I: INSTANTANEOUS; G: GROUND FAULT; A: ALARM

PANEL DEMAND TOTALS

PH. A	28849	VA	241.2 AMP
PH. B	27311	VA	227.6 AMP
PH. C	26097	VA	217.4 AMP

NEW PANEL P1 — NEW WORK

CKT	LOAD VA	DESCRIPTION	CIRCUIT BREAKER NOTE	FUNCTION	TRIP	PHASE A	B	C	CIRCUIT BREAKER TRIP	FUNCTION	NOTE	DESCRIPTION	LOAD VA	CKT
1	600	RANGE HOOD			20	1320			20			RECEPT. MULTI-PURPOSE ROOM	720	2
3	1000	FACP	1		20		1720		20			RECEPT. MULTI-PURPOSE ROOM	720	4
5	300	AUTO DOOR			20			876	20			LTS. 103,104, 105,106,108	576	6
7	3000	RANGE			50	3998			20			LTS. 101, 102, 102a, 109, 110, 111, 112	998	8
9	3000	3#8, #10G IN 1-1/4"C					3360		20			RECEPT. WOMEN & MEN BATHROOMS	360	10
11	500	WATER HEATER			20			1220	20			RECEPT. SUPERVISOR	720	12
13	1500	MICROWAVE			20	2040			20			RECEPT. SUPERVISOR	540	14
15	1200	REFRIGERATOR		GFCB	20		1700		20			ELECTRIC WATER COOLER	500	16
17	1176	DISPOSAL		GFCB	20			1536	20			RECEPT. CORR 102 & VESTIBULE 101	360	18
19	1000	DISHWASHER		GFCB	20	1900			20			RECEPT. LIVING ROOM	900	20
21	500	FIRE ALARM DCC PANEL	1		20		1580		20			RECEPT. WORK	1080	22
23	500	HOT WATER RECIRC. PUMP			20			1580	20			RECEPT. CORR 102	1080	24
25	720	RECEPT. KITCHEN COUNTERTOP			20	1920			20			COFFEE MAKER, KITCHEN	1200	26
27	0	SPARE			20		1000		20			RADIO CHARGER, STORAGE	1000	28
29	0	SPARE			20			900	20			RECEPT. LIVING ROOM	900	30
31	0	SPARE			20	720			20			RECEPT. MULTI-PURPOSE ROOM	720	32
33	0	SPARE			20		0		20			SPARE	0	34
35	0	SPARE			20			0	20			SPARE	0	36
37	0	SPARE			20	0			20			SPARE	0	38
39	0	SPARE			20		0		20			SPARE	0	40
41	0	SPARE			20			0	20			SPARE	0	42

LOAD TYPE	CONNECTED		DEMAND	
EXISTING	0	125%	0	
RECEPTACLES	7920	100%	7920	
MOTOR	2676	100%	2676	
LARGEST MOTOR	0	125%	0	
HVAC	1000	100%	1000	
LIGHTING	1574	125%	1968	
KITCHEN	0	100%	0	
OTHER	13500	100%	13500	
TOTAL	26670	101%	27064	

208Y/120 V; 3 PHASE; 4 WIRE; 10 KAIC; N/A SE LABEL
225 BUS RATING; MLO MAINS TYPE; - MCB RATING; - TRIP UNIT

FED FROM: P/NL DP
MOUNT: FLUSH
NEMA: 1
MAN / MODEL #:
PROVIDE DOOR WITH LOCK AND HINGED TRIM. PROVIDE COPPER BUSS BARS AND BOLT ON BREAKERS.

NOTES:
1. PROVIDE CLIP.
2.
3.
4.

FUNCTIONS AND ABBREVIATIONS

AFCB: ARC FAULT CB; CB: CIRCUIT BREAKER; EX: EXISTING; GFEP: GND FAULT CB (30ma/100mA); GFCB: GND FAULT CB (6mA); ARMS: ARC FLASH REDUCTION MAINTENANCE SWITCH
SFCB: SUBFEED CB; SFL: SUBFEED LUGS; SR: SEE RISER; ST: SHUNT TRIP; UV: UNDERVOLTAGE TRIP
L: LONG TIME; S: SHORT TIME; I: INSTANTANEOUS; G: GROUND FAULT; A: ALARM

PANEL DEMAND TOTALS

PH. A	11343	VA	94.5 AMP
PH. B	9315	VA	77.6 AMP
PH. C	6405	VA	53.4 AMP

NEW PANEL P2 — NEW WORK

CKT	LOAD VA	DESCRIPTION	CIRCUIT BREAKER NOTE	FUNCTION	TRIP	PHASE A	B	C	CIRCUIT BREAKER TRIP	FUNCTION	NOTE	DESCRIPTION	LOAD VA	CKT
1	700	OVERHEAD DOOR			20	1920			20			RECEPT. FRONT BAY	900	2
3	700	OVERHEAD DOOR			20		700		20			SPARE	0	4
5	700	OVERHEAD DOOR			20			880	20			RECEPT. BAY	180	6
7	1440	SHORELINE 20A			20	1620			20			RECEPT. BAY	180	8
9	2400	SHORELINE 30A			30		3300		20			EXTERIOR RECEPTACLES	900	10
11	1440	SHORELINE 20A			20			2160	20			RECEPT. MECH. DECON. PIPE	720	12
13	2400	SHORELINE 30A			30	3400			20	GFCI		WASHER	1000	14
15	1440	SHORELINE 20A			20		3940		20	GFCB		DRYER	2500	16
17	2400	SHORELINE 30A			30			4000	20			2#10, #10G IN 3/4"C	2500	18
19	312	IRH-1			20	1212			20			RECEPT. MED STORAGE	900	20
21	312	IRH-2			20		612		20			AUTO DOOR	300	22
23	1440	RECEPT. WIREWAY TELECOM			20			1940	20			SPRINKLER BELL	500	24
25	360	RECEPT. TELECOM			20	388			20			LIGHTS-FLAG POLE	25	26
27	1056	LIGHTS BAY 113, ALCOVE 113A			20		1206		20			LIGHTS-EXTERIOR	150	28
29	479	LIGHTS 114-117, EF-2, EF-3, EF-6			20			1479	20			ROAD SIGN	1000	30
31	500	ICE MAKER		GFCB	20	1000			20			OIL ALARM	500	32
33	720	RECEPT. TELECOM			20		1620		20			HOT BOX HEATER	900	34
35	900	RECEPT. VEHICLE BAYS			20			1800	20			FIRE PROTECTION HOT BOX	1000	36
37	600	LIGHTING CONTACTOR			20	700			20			OA MOTORIZED DAMPERS	100	38
39	312	H-1 & H-2			15		468		20			SPARE	156	40
41	312	2#12, 1#12G - 3/4"C						468	20			SPARE	156	42

LOAD TYPE	CONNECTED		DEMAND	
EXISTING	0	125%	0	
RECEPTACLES	7020	100%	7020	
MOTOR	8260	100%	8260	
LARGEST MOTOR	0	125%	0	
HVAC	3864	100%	3864	
LIGHTING	3250	125%	4063	
KITCHEN	0	100%	0	
OTHER	14320	100%	14320	
TOTAL	36714	102%	37527	

208Y/120 V; 3 PHASE; 4 WIRE; 10 KAIC; N/A SE LABEL
225 BUS RATING; MLO MAINS TYPE; - MCB RATING; - TRIP UNIT

FED FROM: P/NL DP
MOUNT: FLUSH
NEMA: 1
MAN / MODEL #:
PROVIDE DOOR WITH LOCK AND HINGED TRIM. PROVIDE COPPER BUSS BARS AND BOLT ON BREAKERS.

NOTES:
1.
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FUNCTIONS AND ABBREVIATIONS

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L: LONG TIME; S: SHORT TIME; I: INSTANTANEOUS; G: GROUND FAULT; A: ALARM

PANEL DEMAND TOTALS

PH. A	10431	VA	86.9 AMP
PH. B	12567	VA	104.9 AMP
PH. C	14509	VA	120.9 AMP

LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	SIZE	MOUNTING	MANUFACTURER	LAMP	# OF BALLASTS	NOTES	VOLTAGE	VA
A	2x4 LED TROFFER, ACRYLIC PRISMATIC LENS INTEGRAL DRIVER, 7200 LUMENS 3500K	2' WIDE 4' LONG 3-11/16" HIGH	RECESSED IN CEILING	LITHONIA #2TL4-72L-FW-A12-EZ1-LP835 OR APPROVED EQUAL	LED	N/A	N/A	120	67
B	8' LED OPEN STRIPLIGHT INTEGRAL DRIVER, 10000 LUMENS WIREGUARD, 3500K	3 3/8" WIDE 8' LONG 3 1/4" HIGH	SURFACE MOUNT ON CEILING OR WALL MOUNT AT 96" AFF, PROVIDE VANDAL SHIELD WHERE INDICATED ON PLANS.	LITHONIA #TZL1N-L96-10000LM-L/LENS-35K-90CRI-WH -WGZ48(2) OR APPROVED EQUAL	LED	N/A	N/A	120	83
C	6" DIA LED OPEN DOWNLIGHT SEMI-SPECULAR RELECTOR 2500 LUMENS, 3500K	6" DIA 7 9/16" HIGH	RECESSED IN CEILING	GOTHAM #EVO-35-25-6AR-MD-LSS-EZ1 OR APPROVED EQUAL	LED	N/A	N/A	120	30
D	4' LED LENSED STRIPLIGHT INTEGRAL DRIVER, 5000 LUMENS WIREGUARD, 3500K	3 3/8" WIDE 4' LONG 3 1/4" HIGH	SUSPEND FIXTURE AT 10' AFF OR SURFACE MOUNT WHERE FINISHED CEILING IS LOWER, UON ON PLAN	LITHONIA #ZL1N-L48-5000LM-FST-35K-90CRI-WH OR APPROVED EQUAL	LED	N/A	N/A	120	42
E1	LED EMERGENCY/EXIT SIGN COMBO, SINGLE FACE, RED LETTERS SELF-DIAGNOSTICS, NICKEL CADMIUM BATTERY, 90 MIN. OF EMERGENCY POWER, (2) LED REMOTE LAMPS	16" WIDE 7-1/4" HIGH 2" DEEP	SURFACE MOUNT ON CEILING	LITHONIA: FIXTURE #ECC R OR APPROVED EQUAL	INTERGRAL LED	N/A	1	120	4
E2	EMERGENCY EXIT LIGHTING, 640 LUMMENS, WHITE, 90 MIN OF EMERGENCY POWER ON NICKEL CADIUM BATTERY, CONTEMPORARY, LOW PROFILE (2) LED HEADS	13-1/3" WIDE 3" TALL 3-3/4" DEEP	WALL MOUNT 96" AFF	LITHONIA #ELM4L OR APPROVED EQUAL	LED	N/A	N/A	120	1.2
H	6" DIA LED LENSED SHOWER DOWNLIGHT NON-CONDUCTIVE REGRESSED LENS 3500 LUMENS, 3500K	13 3/16" DIA 7 5/8" HIGH	RECESSED IN CEILING	GOTHAM #EVO-35-35-6-DFR-EZ1 OR APPROVED EQUAL	LED	N/A	N/A	120	30
J	SOLID FRONT UNDER CABINET LED LIGHT FROSTED ACRYLIC, PATTERN #12 SHEILD 1200 NOMINAL LUMENS, 3500K, 82 CRI	2" LONG 4-7/8" WIDE 1" HIGH	UNDER CABINET	WILLIAMS #1SF-2-L24/835-AF12125-DRV-120 OR APPROVED EQUAL	LED	N/A	N/A	120	14
K	ENERGY EFFICIENT LANDSCAPE FLOOD LIGHT DIE-CAST ALUMINUM HOUSING, LED DRIVER 592 LUMENS, 3000K, 83 CRI	3-15/16" DIA 3-1/2" WIDE 8-3/8" HIGH	LANDSCAPE	LITHONIA #OBLF-8-30K-DDB OR APPROVED EQUAL	LED	N/A	N/A	120	11.2
BB	ARCHITECTURAL RECTANGULAR LED WALL PACK, DIE CAST ALUMINUM, DISTRIBUTION TYPE III, FULL CUT-OFF, BLACK FINISH, WET LOCATION, INTEGRAL DRIVER & POWER SUPPLY ACCESSIBLE FROM BELOW	11.1" WIDE 8.1" HIGH 3.2" DEEP	MOUNTED ON WALL AT 10'-0" AFG	LITHONIA #WPX1 LED P1-30K-MVOLT-DDXB OR APPROVED EQUAL	INTERGRAL LED, 3000K, 1537 DELIVERED LUMENS, 70 CRI, 128 LPW	N/A	2,3	120	12
CC	6" OPEN LED DOWNLIGHT, 0-10V DIMMING TO 1%, SELF-FLANGED MATTE DIFFUSE REFLECTOR, CLEAR TRIM, LENSED LIGHT ENGINE & DRIVER ACCESSIBLE FROM BELOW	9-7/16" WIDE 11-3/16" LONG 4" HIGH (MAX)	RECESSED IN CANOPY	LITHONIA #LDN6-30/05-L06-LD-MVOLT OR APPROVED EQUAL	INTERGRAL LED, 3000K, 467 DELIVERED LUMENS, 82 CRI, 85 LPW	N/A	2,3	120	6

GENERAL NOTES

1. CONTRACTOR SHALL COORDINATE FIXTURE MOUNTING STYLE (GRID VERSUS GYP-BOARD) WITH ARCHITECTURAL REFLECTED CEILING PLANS.
2. ALL RECESSED DOWNLIGHTS WHERE INSTALLED IN ACCOUSTICAL CEILING TILE SHALL BE PROVIDED WITH 24" GRID BAR HANGERS.
3. ALL FIXTURES INSTALLED IN MECHANICAL SPACES SHALL BE COORDINATED WITH ALL TRADES TO AVOID CONFLICTS WITH MECHANICAL, PLUMBING, & FIRE PROTECTION EQUIPMENT, PIPING, DUCTWORK, ETC.

KEYED NOTES

1. PROVIDE DIRECTIONAL ARROWS AS SHOWN ON PLAN.
2. PROVIDE FIXTURE WITH 5-YEAR WARRANTY.
3. FIXTURE SHALL BE DEWIGN LIGHTS CONSORTIUM (DLC) QUALIFIED PRODUCT.

NEW PANEL PV — NEW WORK

CKT	LOAD VA	DESCRIPTION	CIRCUIT BREAKER NOTE	FUNCTION	TRIP	PHASE A	B	C	CIRCUIT BREAKER TRIP	FUNCTION	NOTE	DESCRIPTION	LOAD VA	CKT
1	4800	INV#1				7200						INV#2	2400	2
3	4800	STRING #1 AND #2			50		7200		50			STRING #3	2400	4
5	4800	SEE RISER						7200				SEE RISER	2400	6
7	0					0							0	8
9	0	SPARE			50		0		50			SPARE	0	10
11	0							0					0	12
13	0					500			15			PV RTU GATEWAY	500	14
15	0	SPARE			50		0						0	16
17	0							0					0	18
19	0	SPACE				0							0	20
21	0	SPACE					0						0	22
23	0	SPACE						0					0	24
25	0	SPACE				0							0	26
27	0	SPACE					0						0	28
29	0	SPACE						0					0	30

LOAD TYPE	CONNECTED		DEMAND	
EXISTING	0	125%	0	
RECEPTACLES	0	100%	0	
MOTOR	0	100%	0	
LARGEST MOTOR	0	125%	0	
HVAC	0	100%	0	
LIGHTING	0	125%	0	
KITCHEN	0	100%	0	
OTHER	22100	100%	22100	
TOTAL	22100	100%	22100	

208Y/120 V; 3 PHASE; 4 WIRE; 22 KAIC; N/A SE LABEL
225 BUS RATING; MCB MAINS TYPE; 225 MCB RATING; LI TRIP UNIT

FED FROM: FUSS-PV
MOUNT: SURFACE
NEMA: 1
MAN / MODEL #
PROVIDE DOOR WITH LOCK AND HINGED TRIM. PROVIDE COPPER BUSS BARS AND BOLT ON BREAKERS.

NOTES:
1.
2.
3.
4.

FUNCTIONS AND ABBREVIATIONS

AFCB: ARC FAULT CB; CB: CIRCUIT BREAKER; EX: EXISTING; GFEP: GND FAULT CB (30ma/100mA); GFCB: GND FAULT CB (6mA); ARMS: ARC FLASH REDUCTION MAINTENANCE SWITCH
SFCB: SUBFEED CB; SFL: SUBFEED LUGS; SR: SEE RISER; ST: SHUNT TRIP; UV: UNDERVOLTAGE TRIP
L: LONG TIME; S: SHORT TIME; I: INSTANTANEOUS; G: GROUND FAULT; A: ALARM

PANEL DEMAND TOTALS

PH. A	7700	VA	64.2 AMP
PH. B	7200	VA	60.0 AMP
PH. C	7200	VA	60.0 AMP

NEW PANEL EV — NEW WORK

CKT	LOAD VA	DESCRIPTION	CIRCUIT BREAKER NOTE	FUNCTION	TRIP	PHASE A	B	C	CIRCUIT BREAKER TRIP	FUNCTION	NOTE	DESCRIPTION	LOAD VA	CKT
1	3600	EV CHARGER -1 (PORT A)			40	3600			40			SPARE	0	2
3	3600	2#8, 1#10G - 1"C					3600					SPACE	0	4
5	3600	EV CHARGER -1 (PORT B)			40			3600	40			SPARE	0	6
7	3600	2#8, 1#10G - 1"C				3600							0	8
9	0	SPARE			20		0		20			SPARE	0	10
11	0	SPD						0				SPACE	0	12
13	0	SEE RISER			60	0						SPACE	0	14
15	0						0					SPACE	0	16
17	0	SPACE						0				SPACE	0	18
19	0	SPACE				0						SPACE	0	20
21	0	SPACE					0					SPACE	0	22
23	0	SPACE						0				SPACE	0	24
25	0	SPACE				0						SPACE	0	26
27	0	SPACE					0					SPACE	0	28
29	0	SPACE						0				SPACE	0	30

LOAD TYPE	CONNECTED		DEMAND	
EXISTING	0	125%	0	
RECEPTACLES	0	100%	0	
MOTOR	0	100%	0	
LARGEST MOTOR	0	125%	0	
HVAC	0	100%	0	
LIGHTING	0	125%	0	
KITCHEN	0	100%	0	
OTHER	14400	100%	14400	
TOTAL	14400	100%	14400	

208Y/120 V; 3 PHASE; 4 WIRE; 22 KAIC; YES SE LABEL
225 BUS RATING; MCB MAINS TYPE; 225 MCB RATING; LSI TRIP UNIT

FED FROM: UTILITY XFMR
MOUNT: SURFACE
NEMA: 3R
MAN / MODEL #:
PROVIDE DOOR WITH LOCK AND HINGED TRIM. PROVIDE COPPER BUSS BARS AND BOLT ON BREAKERS.

NOTES:
1.
2.
3.
4.

FUNCTIONS AND ABBREVIATIONS

AFCB: ARC FAULT CB; CB: CIRCUIT BREAKER; EX: EXISTING; GFEP: GND FAULT CB (30ma/100mA); GFCB: GND FAULT CB (6mA); ARMS: ARC FLASH REDUCTION MAINTENANCE SWITCH
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PANEL DEMAND TOTALS

PH. A	7200	VA	60.0 AMP
PH. B	3600	VA	30.0 AMP
PH. C	3600	VA	30.0 AMP

INVERTER LOAD SERVED	CKT	P	CB	VA/PHASE A	DESCRIPTION
EXTERIOR EMERGENCY LIGHTING	1	1	20	150	
SPARE	2	1	20		
SPARE	3	1	20		
SPARE	4	1	20		
SPARE	5	1	20		
SPARE	6	1	20		
	7	1	20		
	8	1	20		
	9	1	20		
	10	1	20		
	11	1	20		
	12	1	20		

VOLTAGE RATING	120	MAIN BREAKER?	NO	TOTAL LOAD (VA)	150	PANEL DESIGNATION	LINV
# OF PHASES	1	BREAKER RATING	N/A	DEMAND FACTOR	1.25	NOTES:	
# OF WIRES	3	BUS RATING	60A	DEMAND LOAD (VA)	188		
MOUNTING?	SURFACE	NEUTRAL RATING	100%	DEMAND AMPS	1		
SE RATED?	NO	MINIMUM KAIC	10				

NO.	DESCRIPTION	DATE
1	BID DOCUMENTS	9/25/23
2	ADDENDUM #2	10/19/23

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 020601 Richard D. Anderson 10/19/2023

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WAKE COUNTY
APEX MAIN EMS STATION
6950 APEX BARBECUE ROAD
APEX, NORTH CAROLINA 27502

PROJECT NUMBER: 50146007

OWNER: WAKE COUNTY FACILITIES DESIGN & CONSTRUCTION

CONSTRUCTION DOCUMENTS

DRAWING TITLE:
ELECTRICAL SCHEDULES

SHEET:
E601

DATE
25 SEPTEMBER 2023