

**FRANKLIN COUNTY
CONVENTION FACILITIES
AUTHORITY**

COLUMBUS

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**Addendum No.1
Request for Bids 2026-06
Greater Columbus Convention Center
Exterior Access Control Improvements**

Information Contained within this Addendum No.1 modifies the September 23, 2026 Project Manual for the Greater Columbus Convention Center Exterior Access Control Improvements. Receipt of this Addendum No.1 must be indicated on the Form of Proposal submitted by each bidder.

Bid Date Extension

The deadline for submitting bids is hereby extended until October 19, 2026, at 3:00 PM EST. Sealed bids shall be delivered to the location indicated in the Project Manual.

Updated Technical Specifications

Additional specifications have been released by the Engineer. The attached drawings and specifications are hereby incorporated into the Project Manual and made part of the Request for Bids.

Pre-Bid Meeting and Site Visit

A pre-bid meeting and site visit will be held on Tuesday October 6, 2026, at 10:00 AM EST. Interested parties should meet outside Dock 35 at the Greater Columbus Convention Center located at 400 N. High Street, Columbus, OH 43215. Attendees may enter the dock area via Convention Center Drive.

Questions

1. As it relates to the bid submission and, more specifically, Article 1.C) 3. EEO Certification Clause – we assume this to mean the typical State Certificate of Compliance as it relates to EEO. This is no longer being issued by the State. Can you provide some direction as to what you are specifically looking for here, and we will comply if it is still in existence.

Compliance with the FCCFA's Non-Discrimination Policy, as evidenced by execution of the certificate on page 20 of the Project Manual is sufficient to demonstrate compliance with Article 1 item (C)(3).

Jordan Edmonds
General Counsel

SECTION 26 00 00
DIVISION 26 - ELECTRICAL INTRODUCTORY STATEMENT

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

- A. The requirements of Instructions to Bidders, General Conditions, and Division 1 apply to all work herein.
- B. In addition to conforming to the documents listed in Paragraph 1.01 A. above, the Work performed by the Division 26 Contractor shall conform to all provisions of Sections 26 00 00 through 26 99 99 as included in this Specification. The Division 26 Contractor is to consider the word "Contractor" when used in these Sections to mean himself/herself.
- C. The Division 26 Contractor must read the Specifications of all divisions therein because they will be responsible for Work described in other Sections where reference is made to "Electrical Contractor."
- D. All work included under this heading is subject to the Bidding Requirements, General Conditions and Division 1 General Requirements written for this entire Specification, whether attached to this Part or not, and the Contractor is notified to refer thereto as an integral part of the Work.

1.02 APPLICABLE SECTIONS

- A. Contractor shall perform Work described in the preceding paragraphs, the General Conditions, Division 1 and in the following Sections (as included):

Electrical: Sections 26 00 00 through 26 99 99
- B. Contractor is required to coordinate his/her work with that described in other Sections, and therefore, must familiarize themselves with the entire set of Specifications.

1.03 RESPONSIBILITY

- A. The Engineer's efforts under this Contract are aimed at designing a project which will be safe after full completion. The Engineer has no expertise in, and takes no responsibility for, construction means and methods or job site safety during construction, which are exclusively the Contractor's responsibility. Processing and/or approving submittals made by the Contractor which may contain information related to construction methods or safety issues, or participation in meetings where such issues might be discussed must not be construed as voluntary assumption by the Engineer of any responsibility for safety procedures.

END OF SECTION

SECTION 26 00 05
DIVISION 26 GENERAL REQUIREMENTS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Furnish all materials, labor, tools and equipment to complete and leave ready for operation all electrical systems as called for in these Specifications or shown on the Drawings and any and all details essential to complete the work.
- B. By submitting a bid, the Contractor certifies that:
 - 1. He/she has visited the site and is satisfied that he/she understands all site conditions that may have an effect on his/her bid price.
 - 2. He/she fully understands the makeup, construction, and operation of all systems and equipment he/she is bidding on, and that he/she has included in his/her price all materials, supplies, accessories, and services necessary to make these systems complete and operational.

1.02 REFERENCE

- A. These General Requirements are in addition to the other requirements referenced in Section 26 00 00, "Introductory Division 26 Statement." They are not meant to replace them. In case of conflict, ask the Architect for interpretation.
- B. The Contractor is responsible for becoming thoroughly familiar with all Drawings and Specifications prior to bidding so that all conditions of work are clear with regard to electrical requirements of equipment, mounting conditions, etc. Contractor shall study reflected ceiling plans, elevations, and details, etc.
- C. The Division 26 Contractor is responsible for all electrical work shown, whether noted by his/her division or not, on all Drawings and Specifications in the entire construction documents package. In case of conflict, Contractor shall include greatest quantity of equipment, extent of work, and expense in his/her bid. If there is any question about scope, the bidder must bring his concerns to the attention of the Owner's representative during bidding.

1.03 STANDARDS OF QUALITY

- A. Provide quality work conforming to the best accepted practices and standards of the trade. Further definition of quality is given by reference to various laws, codes, standards, and regulations. Refer also to the publications of NECA (National Electrical Contractors Association).
- B. All laws and codes having jurisdiction over this project are deemed to be included in their entirety as a part of these Specifications. Also, any other laws, codes, standards, or regulations referenced herein are deemed to be included in their entirety.

- C. If a conflict occurs between the Drawings and the Specifications, immediately call the conflict to the attention of the Architect at least ten (10) days before bids are submitted, so an addendum clarification may be issued. Conflicts not brought to the Architect's attention before bids are due, shall be priced by the Contractor to include the most expensive, highest quality and quantity of the conflicting items in question.
- D. Material and equipment installed under this Contract shall be new, undeteriorated, and of a quality not less than the minimum specified. All equipment and conductors shall be certified, listed and labeled by UL. If UL does not certify an associated piece of equipment, then certification by another nationally recognized testing laboratory such as ETL shall be permissible. If equipment or conductors are of a type that no testing lab lists or labels, then a safety evaluation must be performed at the supplier's expense by the inspecting authority or another Federal, State or municipal agency.
- E. The latest adopted editions of the following also apply to this work:
 - 1. National Electrical Code, NEC
 - 2. National Fire Protection Association Publications, NFPA
 - 3. State Building Codes
 - 4. City Codes
 - 5. Americans with Disabilities Act (ADA)

1.04 CONTRACT DRAWINGS

- A. Drawings are schematic and show approximate locations and the extent of work. Exact locations and extent must be coordinated with other Contractors and verified in the field. Coordination of the final fabrication drawings and final coordination of the installation in the field is the Contractor's responsibility. Contractor is to take the design to the next level of detail knowing exactly what equipment and materials he/she is going to provide and build the project based on that equipment and other approved shop drawings.
- B. Significant deviations from Drawings must be approved by the Architect.
- C. The Architect reserves the right to make minor changes in location which do not require additional labor or material up to the time of roughing-in without additional cost. No cost shall be added to the Contract for a minor change. The Architect shall determine what is "SIGNIFICANT" and what is a "MINOR" change.

1.05 DEFINITIONS

- A. "Provide": To furnish and install.
- B. "Concealed": Embedded in or installed behind walls and floors, within partitions, above suspended ceilings, or below grade.
- C. "Exposed": Not installed underground or "concealed" as defined above.
- D. "Contractor": Means the Division 26 Contractor.
- E. "Furnish": To purchase and deliver products to the project site and make ready for installation.

- F. "Install": To take furnished products, assemble, erect, secure, connect, and place into operation.
- G. "Products": Includes materials, systems and equipment.
- H. "Work": The providing of products for entire Contract.

1.06 PERMITS, FEES AND NOTICES

- A. Unless otherwise excluded in the Contract Documents, secure and pay for all permits and governmental fees, licenses, and inspections necessary for the proper execution and completion of work.
- B. Give notice and comply with all laws, ordinances, rules, regulations and lawful orders of any public authority having jurisdiction on the performance of the work.

1.07 EXAMINATION OF SITE

- A. Certain existing conditions may affect the manner or sequence of the performance of work. Review existing services and structures prior to bidding the work. Review operating schedules for existing systems and services. Coordinate the scheduling of the work with existing operations.
- B. The Contractor is required to visit the site of the proposed project. After the Contract is signed, no allowance will be made for lack of knowledge of the project conditions.
- C. Verify and reconcile work required by the Contract Documents with conditions at the site.

1.08 UTILITIES

- A. Locate any existing utilities prior to construction. Advise the Architect immediately of major conflicts to permit modification of the Contract Documents.
- B. Contractor shall record exact locations of all existing overhead and underground site utilities within the project limits on a site layout plan and submit to Architect for review prior to any excavation. Where existing utilities conflict with new work, proposed modifications shall also be marked and identified on the site layout plan.
- C. Record locations of all concealed utilities on the Record Drawings.
- D. Coordinate any utility service shutdowns or outages with the Architect and the Owner. Shutdowns shall conform to all utility company requirements. Avoid inconveniencing the Owner and provide temporary service during the curtailment, as required by the Architect or the Owner. Provide ten working days advance notice for any required utility outages.
- E. At least ten (10) working days prior to construction in an area which may involve underground utility facilities, the Contractor shall notify the Project Engineer, the registered utility protection service and each underground utility company:
 - 1. Utilities Protection Service
Phone 1-800-362-2764

1.09 ABBREVIATIONS

- A. Abbreviations used in these specifications:
- | | | |
|------|---|---|
| ADA | - | Americans with Disabilities Act |
| ANSI | - | American National Standards Institute |
| CBM | - | Certified Ballast Manufacturers |
| EIA | - | Electronic Industries Association |
| ETL | - | Electrical Testing Laboratories |
| FCC | - | Federal Communications Commission |
| ICEA | - | Insulated Cable Engineers Association |
| IEC | - | International Electro Technical Commission |
| IES | - | Illuminating Engineering Society |
| ITL | - | Independent Testing Laboratories |
| NEC | - | National Electrical Code |
| NECA | - | National Electrical Contractors Association |
| NEMA | - | National Electrical Manufacturers Association |
| NESC | - | National Electrical Safety Code |
| UL | - | Underwriters Laboratories |

PART 2 PRODUCTS

2.01 DESIGN BASE MANUFACTURERS ("STANDARDS")

- A. The Contract Documents are based on the requirements and layout of the equipment of the Design Base Manufacturer. Coordination of equipment with the building and with other trades has been made for these specific models and manufacturers of equipment. Where several manufacturers are listed, the first named is the Design Base Manufacturer, unless specifically noted otherwise. Products of the other listed manufacturers which are of comparable performance and quality to the Design Base Manufacturers may be submitted for review and approval per Section 26 00 15, "Submittals." Refer to 26 00 05, "Division 26 General Requirements," Paragraph 2.02, "Approved Equals" for products of manufacturers not listed.
- B. Prepare new layouts for all non-Design Base Manufacturers equipment and adjust and coordinate these layouts with equipment dimensions or service requirements which may be different from those of the Design Base Manufacturer. Verify that this equipment will fit and function in the indicated application. Submit these layouts as part of the submittal review.
- C. Whenever the Contractor furnishes equipment or material other than the Design Base Manufacturer specified, the Contractor is responsible for the cost and coordination of all modifications required not only for his/her work, but also for the work of all other Trades affected. Where changes to other Trades' work are required, this Contractor must include the additional costs of all such work in his/her bid and ultimately make arrangements with these other Trades for such changes and compensate them accordingly. Where changes to design are required, the Contractor shall submit such changes to the Architect for approval. The Contractor shall investigate potential conflicts such as the following:
1. Physical dimensions and weights
 2. Code required working clearances
 3. Connecting pipe sizes

4. Additional control and interlock wiring
5. Lug size and quantity
6. Increased ratings for conductors, overcurrent protective devices, and motor control equipment
7. Increased ventilation requirements
8. Battery capacity
9. Sound levels of audible devices
10. Increased withstand and interrupting ratings of downstream equipment due to differences in overcurrent protective device characteristics

2.02 APPROVED EQUALS (EQUIVALENT) PRODUCTS

- A. Equal (equivalent) components (articles, devices, materials, forms of construction, fixtures, etc.) by manufacturers not listed but meeting the specifications may be submitted to the Architect for consideration and possible inclusion into the bidding documents. Submission must be received no later than ten (10) working days before bid date. If approved, such manufacturers will be listed in an addendum.
- B. Submittals must include all of the following:
 1. Cover Letter: Company letterhead; addressed to Architect. Indicate the following:
 - a. Project name, project number, and phase or bid package if applicable
 - b. Specification Section by number and title
 - c. Specified Product
 - d. Proposed Product
 - e. Deviations, if any, from Specified Product
 - f. List of attachments
 2. Product Data: Manufacturer's literature, fully describing proposed product with exact item clearly indicated.
 3. Specifications: Manufacturer's specifications with all modifications noted as required to show compliance with Bidding Documents.
 4. Test Data: Where performance requirements are specified, submit laboratory tests to indicate compliance.
- C. Failure to comply with and provide all of the above requirements will result in the submission not being reviewed.

2.03 QUANTITIES

- A. Equipment may be referred to either in these Specifications or on the Drawings, as singular or plural; Contractor is responsible for verifying the exact number of items required to complete his/her work.

2.04 OWNER FURNISHED (CONTRACTOR INSTALLED) EQUIPMENT

- A. Certain items of equipment may be furnished by the Owner to the Contractor. The Contractor shall take delivery of such items and unload them from the truck at the job site.
- B. The Contractor shall protect and store such items as part of this Contract.
- C. The Contractor shall install these items in conformance with the requirements of the Specifications and Drawings and the supplier's recommended installation instructions.

2.05 ACCESS DOORS

- A. Install junction boxes, remote ballasts, power supplies, etc. in locations where they will be accessible. Where not possible, Division 26 Contractor shall pay General Contractor to install access doors for electrical equipment. Coordinate all access door types and locations with the Architect. Remote ballasts and power supplies shall be located in a ventilated space.

2.06 RECORD (AS-BUILT) DRAWINGS

- A. Contractor shall maintain at the job site, one (1) copy of Drawings which shall be used exclusively for recording the location of all installed work; not extraneous information such as field notes. Neatly record all information with red pen.
- B. Record deviations in locations of concealed conduit, equipment, lighting, outlets, manholes, etc., dimensioned from a fixed control point, including depth of bury, at each change of direction, at each change of slope and as required for further reference. Minor variations need not be recorded. Addendums, Change Orders, Field Work Orders, Supplemental Instructions and other pertinent changes of record shall be recorded. These changes shall be reviewed monthly for conformance.
- C. Record deviations made necessary to incorporate equipment different from the Design Base equipment.
- D. At completion of the project, Contractor shall deliver "As-Built" Drawings and Coordination Drawings to the Architect for review and approval with regard to completeness. This submission shall consist of the job site "As-Built" Drawings in electronic format and as PDF files. Following approval, provide a full-plotted set as well as the electronic version and original.
- E. Refer to Division 1 for additional requirements.

PART 3 EXECUTION

3.01 PAINTING AND RELATED WORK

- A. Finish painting in areas of new construction is the responsibility of the General Trades Contractor and is specified in Division 9.
- B. Any other painting, required by Sections in Division 26, is the responsibility of the respective Division 26 Contractor. It shall be done by a qualified tradesman skilled in the craft, and shall meet the requirements of Division 9. Each Contractor is responsible for repainting of finished areas disturbed by his/her own cutting and patching.
- C. Factory-finished equipment which has rusted or has been damaged shall be cleaned, spot primed with zinc chromate, and finished to the original quality and color by the Contractor.
- D. Support steel shall be cleaned, rust removed, primed, and painted.

3.02 CUTTING AND PATCHING

- A. Unless otherwise required in General or Special Conditions, Contractor shall perform all cutting and patching required for his/her own work. Work must be accomplished in a neat and workmanlike manner, acceptable to the Architect.
- B. If necessary to cut into work of other Trades, it shall be done by other Trades at this Contractor's expense. Patching shall be similarly executed.
- C. Cutting of structural support beams, joists, plates, or other structural members is strictly prohibited without the specific written consent of the Architect. Use rotary drills where cutting holes through concrete, brick, plaster, or tile is necessary. Obtain approval of the Architect before proceeding with work.
- D. All cutting and patching shall be done promptly and all repairs shall be made as necessary to leave the entire work in good condition, including all cutting, fitting, and drilling of masonry, concrete, metal, wood, plaster, and other materials as specified or required for proper assembly, fabrication, installation, and completion of all work of the Contract.
- E. Patching shall match adjacent materials and shall be accomplished only by tradesmen skilled in the respective craft required. Materials and equipment used in the patching work shall comply with requirements of those Sections of the Specifications relating to material to be used in new construction.

3.03 SCAFFOLDING, RIGGING, HOISTS AND TRANSPORTATION

- A. The Contractor shall provide scaffolding, staging, cribbing, tackle, hoists, and rigging necessary for placing of his/her materials and equipment in their proper places in the project.
- B. The Contractor shall pay costs for transportation of materials and equipment to the jobsite and shall include such costs in his/her proposal.
- C. Scaffolding and hoisting equipment shall comply with requirements of applicable Federal, State, and Local Laws and Codes.

3.04 CLEANING

- A. Upon completion of work, all material and equipment furnished in this Contract shall be thoroughly cleaned of labels, dirt, grease, rust, oil and other foreign matter. Prepare for finish painting, where painting is specified.

3.05 TESTS

- A. The Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction may require portions of the work to be inspected, tested, or approved. These services shall be performed by approved agencies.

- B. The Architect (and Owner's representative) must be notified of all scheduled tests and adjustments at least 72 hours before they are scheduled so that he/she may witness same. Obtain confirmation of attendance or absence for each test. If the Contractor performs any test or adjustment without the Architect present, or without proper notification, the Contractor may be required to perform the test or adjustment a second time. All test schedules are to be coordinated with the Owner to minimize inconvenience.
- C. The Contractor shall bear all costs of such inspections, tests, or approvals.
- D. Required certifications of inspection, testing, or approval shall be secured by the Contractor and included in the Record and Information Manuals. See Section 26 00 20, "Record and Information Manuals."

3.06 WARRANTY OF WORK

- A. The Contractor shall warrant all work for a period of one (1) year from date of Contract Completion against defects in materials, equipment, and workmanship. All manufacturer warranties shall begin on date of Contract Completion also.
- B. The Contractor will be required to make all repairs or changes which, in the opinion of the Owner, are necessary as the result of defective materials, equipment, or workmanship.
- C. The Contractor shall, promptly upon receipt of notice from the Owner, and without expense to the Owner, replace all defective work with suitable materials and equipment.
- D. Failure by the Contractor to promptly respond to warranty service calls can be sufficient reason for the Owner to have the defects corrected at the expense of the Contractor.
- E. Refer to Division 1 for additional guarantee requirements.
- F. Refer to other Specification Sections for extended warranty requirements.

3.07 TEMPORARY POWER

- A. Provide temporary electrical power to be used for construction purposes by all Contractors in accordance with Division 1. Provide all fixtures, wiring, and equipment, and make all connections required for temporary electrical service during the construction period; coordinate all power and lighting requirements with the various trades. Provide power to contractor job trailers, and power and lighting on the construction site. Contractor to pay for energy consumption, and any utility company charges to establish service.
 - 1. Temporary Service Panels: Provide a minimum of one (1) 100 Ampere rated service panel in a location or locations within 200 feet of all building work areas; include as many such panels as required to meet 200 foot maximum distance. Provide all wiring and raceways required for service connection and branch circuit wiring connecting each panel to the serving utility and to the following electrical loads; obtain all permits required.
 - 2. Lighting: Provide minimum of 5 footcandles of illumination in all building work areas where construction work is being accomplished; increase illumination to 50 footcandles for painting, plastering and other interior fine finish work.

3. Outlets: Provide duplex receptacle outlets on 100 foot centers maximum; arrange and locate so that no work area of the building is more than 100 feet from a 120 volt outlet; allow no more than five (5) outlets on any 20 Ampere circuit.
4. Power Circuit Breaker: Provide one 100 Ampere, 208 volt, 3 phase or 240 volt, 1 phase circuit breaker in each panel for power equipment.

END OF SECTION

SECTION 26 00 10
COORDINATION BETWEEN TRADES

PART 1 GENERAL

1.01 DESCRIPTION

- A. The Division 21, 22, 23, 26, 27 and 28 Contractors shall coordinate their rough-in, service, and control requirements with each other. Division 26 Contractor shall review all control Drawings to coordinate exact number and locations of temperature control panels as well as to provide proper starters (including necessary time delays, auxiliary contacts, etc.).
- B. Division 26 Contractor shall coordinate all of his/her work with the General Trades Contractor for location of all devices, luminaires and equipment prior to rough-in.
- C. All wiring required to power Division 21, 22, 23, 27 and 28 equipment shall be installed by the Division 26 Contractor, including 120 volt to temperature control panels. The Division 26 Contractor shall be responsible for all wiring from the fire alarm control panel.
- D. If motors and/or equipment are furnished by other divisions, which require larger or smaller starters, safety switches, circuit breakers, fuses, and/or branch circuit conductors than indicated, the Contractor furnishing the motors or equipment shall reimburse the Division 26 Contractor for any cost differential of providing different sized equipment.
- E. All electrical devices furnished as a part of Division 21, 22, 23, 27 and 28 equipment, and installation requirements of all electrical work done by Division 21, 22, 23, 27 and 28 Contractors shall conform to the applicable sections of Division 26.
- F. Division 26 Contractor shall coordinate with other Contractors prior to installation of switchboards and panelboards to ensure requirements of NEC Article 110 and 408 are met. The Contractor violating this requirement shall be responsible for the cost of all modifications required to comply to the satisfaction of the inspection agency for failure to meet the above code requirements.
- G. Final operation of equipment provided under Division 21, 22, 23, 27 and 28 shall be the responsibility of the respective Division 21, 22 or 23 Contractor.
- H. Division 26 Contractor shall coordinate in particular with Divisions 8, 10, 11, 12, 13, and 14 Contractors for specific requirements for door hardware, kitchen equipment, elevators, pool, theatrical equipment, window shades, etc.
- I. Division 26 Contractor shall provide an appropriate safety switch for all mechanical equipment that he/she is providing power for, unless furnished with equipment.
- J. Division 26 Contractor is responsible for all electrical work shown on all documents within the bid set.

END OF SECTION

SECTION 26 00 15
SUBMITTALS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Refer to the GENERAL CONDITIONS and Division 1 for general requirements.
- B. Materials and equipment installed in this work shall meet all the requirements of the Contract Documents and no materials or equipment shall be ordered until submittals are reviewed and approved by the Architect and Engineer.
- C. Submit complete catalog data or shop drawings for each manufactured item of equipment and all components to be used in the work, including specific performance data, material description, rating, capacity, working pressure, dimensional data, material gauge or thickness, wiring diagrams, brand name, catalog number, and general type.
- D. Catalog data for equipment reviewed by the Engineer shall not take precedence over the requirements of the Contract Documents. The review of the Engineer shall not relieve the Contractor from the responsibility for deviations from Drawings or Specifications, nor from the responsibility for providing proper clearance and coordination with other Trades.
- E. When submitted for review, all shop drawings shall bear the Contractor's signed certification that he/she has reviewed, checked, and approved the shop drawings, that they have been coordinated with the requirements of the project and with the provisions of the Contract Documents, and that he/she has verified all field measurements and construction criteria, materials, catalog numbers, and similar data. Annotations shall be in red ink.
- F. Each required Specification Section submittal shall be complete with all required information included in one PDF file. External web links are not permitted. Include a transmittal cover page indicating Specification Section name and number.
- G. Each section shall be submitted separately for each section. Combining sections will result in revise and resubmit with no review.
- H. Submittals shall be sent to shopdrawings@korda.com.

1.02 CONTRACTOR'S RESPONSIBILITIES

- A. Complete review of shop drawings, product data, and samples prior to submission.
- B. Determine and verify:
 - 1. Field Measurements
 - 2. Field Construction Criteria
 - 3. Catalog Numbers and Similar Data
 - 4. Conformance with Specifications
- C. Coordinate each submittal with requirements of the work and the Contract Documents.
- D. Include a letter in the front of the submittal of any deviations in the submittals from the requirements of the Contract Documents.

- E. Make submittals and resubmittals, if necessary, promptly in accordance with the approved schedule and in such sequence as to cause no delay in the work or in the work of any other Contractor, or the project as a whole.
- F. Make any corrections or changes in rejected submittals as required by the Architect and resubmit until approved.
- G. Begin no fabrication or work which requires submittals until approved submittals are returned.

1.03 INCORPORATION OF SUBMITTALS INTO RECORD AND INFORMATION MANUALS

- A. Refer to Section 26 00 20, "Record and Information Manuals."

1.04 CERTIFICATIONS

- A. Provide:
 1. Test Agency results verifying capacities, operating conditions and power requirements at design conditions
 2. Manufacturer's Statement of Compliance with Standards discussed in individual Specification Sections
 3. Equipment labels indicating Certification requirements
 4. Quality standard designations on each unit piece
 5. Typed verification that noted mixes, chemical compositions, and testing procedures were complied with
 6. Other Certifications listed in other Sections of the Specifications

1.05 REQUIRED SUBMITTAL INFORMATION

- A. Submittal Transmittal
 1. Provide the following information on the Transmittal Form for each submittal:
 - a. Project name and address.
 - b. Specification number, as listed for each submittal item required in Paragraph 1.05C below.
 - c. Item description, as listed for each submittal item required in Paragraph 1.05C below. Where equipment is identified by number or tag on the documents, same shall be indicated on the submittal.
 - d. Specification number and item description (b and c, above) for each submittal if more than one submittal is sent under one transmittal form.
 - e. Name, address and telephone number of Contractor.
 - f. Bid package number (if applicable).
 2. Submittal Transmittal Forms not properly identified with the above information will be returned (without review) to the Contractor.

- B. Refer to the following letter key:

KEY FOR REQUIRED SUBMITTALS:

- A. Shop Drawings and/or Layout Drawings
- B. Product Data Sheets
- C. Color Samples

- D. Product Samples
- E. Typed Statement
- F. Typed Verification of Compliance with Certification Requirements
- G. Motor Efficiencies and Power Factor
- H. Wiring Diagrams
- I. Installation, Operation, and Maintenance Instructions
- J. Reports or Test results

C. Submit information on equipment items as listed below.

SECTION #	CONTRACT ITEM	SUBMITTALS REQUIRED
26 00 20	RECORD AND INFORMATION MANUALS	A, B, E, F, H, I
26 00 75	ACCESS PANELS	B
26 00 80	POWER SYSTEM COORDINATION ANALYSIS	J
26 05 37	FLOOR OUTLETS	B
26 06 10	CABLE TRAY	B
26 08 40	ELECTRICAL TESTS, ADJUSTMENTS, INSPECTIONS	J
26 09 23	ELECTRICAL CONTROL EQUIPMENT	B, H, I
26 09 26	LOW VOLTAGE CONTROL SYSTEM	A, B, H, I
26 22 13	DRY TYPE TRANSFORMERS	B, I
26 24 13	SWITCHBOARDS	A, B, H
26 24 20	PANELBOARDS	B, I
26 24 22	DISTRIBUTION PANELBOARDS-CIRCUIT BREAKER TYPE	B
26 26 30	TWO-WAY EMERGENCY COMMUNICATIONS SYSTEM	A, B, H, I
26 27 26	WIRING DEVICES AND PLATES	B
26 28 13	FUSES	B
26 28 16	SAFETY SWITCHES	B, I
26 28 17	ELEVATOR SAFETY SWITCHES	B, H
26 28 19	CIRCUIT BREAKERS	B, I
26 29 13	MOTOR CONTROLLERS	B, H, I
26 32 10	EMERGENCY GENERATOR	A, B, H, I
26 36 23	AUTOMATIC TRANSFER SWITCHES	A, B, H, I
26 41 13	LIGHTNING PROTECTION SYSTEM	A, B, H, I
26 43 13	TRANSIENT VOLTAGE SURGE SUPPRESSION	B, I
26 51 14	LUMINAIRES	B
26 81 11	FIRE ALARM SYSTEM	A, B, H, I
26 81 15	EMERGENCY RESPONDER RADIO ANTENNA REPEATER SYSTEM	A, B, H, J
26 81 18	RF SURVEY FOR EMERGENCY RESPONDER RADIO ANTENNA REPEATER SYSTEM	A, J

- D. After approval, one (1) copy shall be returned to the Contractor. Contractor shall make prints of the approved transparencies and reproductions of all other shop drawing information as necessary for his/her use and for inclusion in the Record and Information Manuals.

END OF SECTION

SECTION 26 00 20
RECORD AND INFORMATION MANUALS

PART 1 GENERAL

1.01 RECORD DRAWINGS

- A. Refer to Division 1 for general requirements as well as for specific information regarding Record (As-Built) Drawings. All drawings shall be provided in electronic PDF format.

1.02 OPERATION AND MAINTENANCE MANUALS

- A. Refer to Division 1 for general requirements and for specific information regarding Operation and Maintenance Manuals, including required format(s) (paper and/or electronic) and quantity. If no such requirements are listed in Division 1, provide in electronic format. Submit one (1) copy of draft manual to the Architect for review and approval thirty (30) days before final inspection is due. After approval, submit three (3) approved manuals to the Owner and obtain receipt. (See Section 26 00 99, "Requirements for Contract Completion.")
- B. Paper Copy Manuals shall be loose leaf, three-ring, heavy-duty hard-cover binders. Material shall be typewritten or printed and be fully legible. Each section shall be divided by labeled tabs.
- C. Electronic Copy Manuals shall be PDF file format. Individual documents shall have filenames corresponding to specification sections and system names. Each document shall have bookmarks corresponding to the systems, subsystems, and equipment names. Use electronic files prepared by manufacturers where available.
- D. The following items, together with any other necessary pertinent data, shall be included in each Manual:
 - 1. Each manual shall be labeled on front cover with project name, Contract, Contractor's name, Architect, Engineer, and date of project completion.
 - 2. Manufacturers' names, nearest Factory Representative, and model and serial numbers of components of systems
 - 3. Operating instructions, start-up and shutdown procedures
 - 4. Maintenance instructions
 - 5. Routine and 24 hour emergency service/repair information:
 - a. Name, address, and telephone number of servicing agency
 - b. Names of personnel to be contacted for service arrangements
 - 6. Parts list with numbers of replaceable items, including sources of supply
 - 7. Manufacturers' literature describing each piece of equipment
 - 8. One (1) approved copy of each submittal
 - 9. Written warranties
 - 10. Certificate of Material Receipt and Certificate of System Completion
 - 11. One (1) typewritten directory for each panelboard as installed
 - 12. Record (As-Built) Drawings
 - 13. Certificate of Final Inspection signed by Building Authority Having Jurisdiction
 - 14. Test results
 - 15. Coordination analysis (see Section 26 00 80, "Power System Coordination Analysis")
 - 16. Video recordings of all equipment demonstrations and training sessions

END OF SECTION

SECTION 26 00 25
EXCAVATION, BACKFILL, AND PROTECTION OF UTILITIES

PART 1 GENERAL

1.01 DESCRIPTION

- A. Provide all protection, removal, and relocation of existing utilities and all excavation and backfilling (including concrete), associated with the work of this Division.
- B. Locate all existing utilities and equipment, in all areas of work, and record the actual locations. Take extreme care during excavations to avoid interruption of utilities. Relocate new work, as directed by the Architect or Engineer, if required to coordinate new work with existing conditions. If incorrectly charted or uncharted utilities are encountered, notify the Architect immediately.
- C. Disconnect all utilities designated for removal or relocation.
- D. Cooperate with other Contractors and Utility Companies to protect existing utilities and avoid disruption of service. Repair damaged utilities to the satisfaction of the Architect and the Utility Companies.
- E. Restore or repair to its existing condition all lawns, planting areas, curbs, paving, streets, and walks damaged by the work of this Division.
- F. Coordinate the timing of excavation and backfilling with the work of other Contractors and the requirements of the Architect.
- G. In general, conform to the requirements of Division 2, except as specifically modified in this Section.
- H. Refer to boring tests and other subsurface records for rock strata that will be encountered in excavation and include sufficient costs in bid for their removal.

1.02 EXCAVATION SAFETY

- A. It is solely the Contractor's responsibility to comply with all governing codes and ordinances regarding safety of open excavations. This includes the use of all sheet piling, bracing, shoring, sheathing, warning lights, barricades, etc. that may be required. Such material will remain the Contractor's property upon completion of the work.

1.03 SUBMITTALS

- A. For Review:
 - 1. Site layout plan sheet with recorded location of all existing utilities and equipment. Submit for review prior to starting any excavation work.

PART 2 PRODUCTS

2.01 BACKFILL

- A. Type A Materials:
 - 1. Crushed Stone: 3/8 inch size
 - 2. Pea Gravel: 1/4 inch minimum, 5/8 inch maximum
 - 3. Sand: Clean, dry, coarse, or medium size
 - 4. Washed Gravel: 3/4 inch normal size
- B. Type B Materials: (Backfill may not contain large rocks (over 2 inches), building materials, masonry debris, cinders, rubbish, wood, or other material subject to decay or prone to damage buried portions of the work.)
 - 1. Excavated Material (or other clean soil): As permitted in Division 2.

2.02 UNDERGROUND WARNING TAPE

- A. Tape shall be a 6 inch wide polyethylene material which resists acid, alkalis, and other soil substances. Black printing shall identify buried service. Background color shall be as recommended by the American Public Works Association (APWA). Brady or equal.

PART 3 EXECUTION

3.01 EXCAVATION

- A. Excavate as shown on the Drawings removing all material encountered.
- B. Excavations are to be open cuts from the surface. Undercuts are prohibited, except where specifically permitted by the Architect. Hold trench width to a minimum, with banks as nearly vertical as possible.
- C. Maintain 5 feet clear between trench and parallel building footing, unless specifically approved by the Architect. When parallel trenches are required to be deeper than footing, maintain a clear distance at least 1 1/2 times the vertical distance below the bottom of the footing, or 5 feet, whichever is greater.
- D. Where bedding or concrete encasement is required by Section 26 05 43, "Underground Raceways," extend mechanical excavation as required to accommodate bed.
- E. Where bedding or concrete encasement is not required, extend mechanical excavation only to within 4 inches of bottom of trench depth, and excavate remainder by hand, so that final support is by undisturbed soil. Shoring from bottom of excavated trench is prohibited.
- F. Keep excavation free of standing water by drainage or by pumping where necessary.
- G. Keep excavations free of frost by covering or heating or both.

3.02 BACKFILL

- A. Backfill shall be as follows:
 - 1. For excavations through lawn areas: Type B.

2. For excavations through roadways, parking areas, sidewalks, plazas, etc.: Type A.
 - B. Where unstable or wet soil in trench bottom requires over excavation to firm soil, and in areas of accidental undercutting, backfill to planned bottom elevation with crushed stone, tamped firmly in place.
 - C. Backfill only when exact locations of lines and equipment have been recorded and all tests and inspections have been completed.
 - D. Do not use fill in a frozen condition or place fill on frozen ground.
 - E. Install a continuous warning tape with printing identifying buried service, 12 inches below finished grade, during backfilling operation.
 - F. Refer to Section 26 05 43, "Underground Raceways" for concrete encasement requirements. Do not backfill above concrete until concrete has had sufficient setting time (one day minimum).
 - G. Remainder of backfill shall be per the requirements of Division 2.
 - H. Install backfill in 8 inch lifts and compact to 98%.
 - I. Fill any settled areas at completion of project.

3.03 SPOILS

- A. Stockpile excavated material onsite in accordance with Owner's direction. Remove from site prior to project completion.

END OF SECTION

SECTION 26 00 30
CONCRETE FOUNDATIONS, SUPPORTS, AND ENVELOPES

PART 1 GENERAL

1.01 DESCRIPTION

- A. Provide all concrete work needed for this Division as shown on the Drawings and herein specified. All concrete work incidental to the work of Division 26 is the responsibility of the Division 26 Contractor. Provide concrete for all equipment as listed below:
1. Encasement of underground raceways
 2. Concrete collars around conduit penetrations
 3. Exterior lighting fixture and lighting pole foundations.
 4. Electrical service transformer pad.
 5. Switchboard equipment pad.
 6. Distribution Panel pad
 7. Dry type transformer pad
 8. Emergency lighting inverter equipment pad
 9. Emergency generator pad.
 10. Generator daytank pad
 11. Generator Connection/Distribution Cabinet pad
 12. ERRS Cabinet pad
 13. Automatic Transfer Switch pad
 14. Primary voltage switch pad.
 15. Secondary voltage bus enclosure pad
 16. Emergency telephone/lighting fixture pedestal pad
 17. CT metering cabinet pad
 18. EVSE electric vehicle charger pad
 19. Metering Pedestal/Panel pad
 20. UPS and Power Conditioner pad
 21. Manholes and handholes

1.02 QUALITY ASSURANCE

- A. Refer to Section 03 30 00, "Cast-in-Place Concrete."
- B. Refer to Section 26 05 43, "Underground Raceways"

1.03 SUBMITTALS

- A. For Review:
1. Concrete compression testing reports
- B. To be included in Record and Information Manuals:
1. One (1) copy of each approved submittal

PART 2 PRODUCTS

2.01 CONCRETE

- A. Refer to Section 03 30 00, "Cast-in-Place Concrete."

PART 3 EXECUTION

3.01 APPLICATION

- A. Provide concrete pads of sufficient size and thickness in accordance with manufacturer of equipment. Details shown on the Drawings shall be considered a minimum requirement.
- B. Coordinate concrete pad requirements with provider of equipment.
- C. Provide minimum 2 inch concrete collar (framed using 2 inches x 4 inches nominal lumber) around all conduit and sleeve penetrations through floors. Sleeves shall extend up through floor to top of concrete collar.

3.02 INSTALLATION

- A. Refer to Section 03 30 00, "Cast-in-Place Concrete."
- B. Provide concrete compression testing for luminaire pole foundations and exterior equipment pads.
- C. Do not mount equipment on concrete supports until concrete has had sufficient setting time (seven days minimum).

END OF SECTION

SECTION 26 00 55
SLEEVES, SEALS, AND FIRESTOPS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Furnish and install sleeves for conduit penetrations through masonry and concrete construction or where conduit passes through walls exposed and through smoke or fire rated separations.
- B. Provide watertight and firestopping as specified herein.

1.02 QUALITY ASSURANCE

- A. Firestopping materials shall be classified by UL as "fill, void or cavity materials" and "through penetration firestop systems."
- B. Firestopping materials shall conform to both Flame (F) and Temperature (T) ratings as tested by nationally accepted test agencies per ASTM E-814 or UL 1479 Fire Tests of Through-Penetration Firestops.
 - 1. The F rating shall be a minimum of one (1) hour, but not less than the fire resistance rating of the assembly being penetrated.
 - 2. Conduct the fire test with a minimum positive pressure differential of 0.01 inches of water column.
- C. Firestopping equipment used shall be in accordance with the Manufacturer's written installation instructions.
- D. Firestopping materials shall be expanded to fill cavities or provide adhesion to substrates that will maintain seal under normal expected movements of substrates.

1.03 SUBMITTALS

- A. For Review:
 - 1. Manufacturer's product data sheets indicating product characteristics, performance and limiting criteria
 - 2. Manufacturer's installation instruction for each type of seal or firestop required by the project
 - 3. Written certification that firestopping systems meet firestopping requirements specified herein
- B. To be included in Record and Information Manuals:
 - 1. One (1) copy of each approved submittal

1.04 MANUFACTURERS

Subject to compliance with requirements, provide products by one of the following:

- A. Seals
 - 1. Link-Seal by Thunderline Corporation
 - 2. CSD Sealing Systems
 - 3. O-Z/Gedney Inc.

- B. Firestopping Materials
 - 1. Hilti
 - 2. Tremco Sealants & Coatings
 - 3. 3M Fire Protection Products
 - 4. Dow Corning
 - 5. CSD Sealing Systems

PART 2 PRODUCTS

2.01 SLEEVES

- A. Sleeve material through floors and walls shall be machine cut rigid galvanized steel conduit.
- B. Sleeves installed in new construction shall have welded flange at mid-point of sleeve which functions as a water barrier and anchor collar.
- C. At the Contractor's option, steel wall sleeves by Link-Seal may be provided.

2.02 SEALS

- A. Modular Mechanical Type
 - 1. Seals shall consist of interlocking synthetic rubber links shaped to continuously fill the annular space between conduit and sleeve.
 - 2. Seal assembly shall have steel bolts and nuts and rubber sealing element for service and environment under which assembly will be used. Seal shall have a pressure resistance rating of 20 psig.
- B. Sealing Plug Type
 - 1. Seals shall consist of two (2) identical piece plugs made of synthetic rubber with one edge flanged, serrated profile on the outside and a series of ridges on the inside which compress and assures a tight seal. Seal shall have a pressure resistance of 15 psig at the plug base and 30 psig at the flange. Rubber grade shall be suitable for the service and environment under which sealing plug will be used.

2.03 WATERTIGHT SEALS

- A. Modular mechanical type watertight seals shall have zinc galvanized bolts and nuts with EPDM rubber sealing element. Seals shall be Link-Seal, Type C.
- B. Sealing plug type watertight seals shall be made of EPDM rubber. Seals shall be by CSD Sealing Systems.

2.04 FIRE RATED SEALS

- A. Modular mechanical type fire rated seals shall have zinc galvanized bolts and nuts with silicone rubber sealing element which provides a three hour fire resistance rating.
- B. Sealing plug type fire rated seals shall be made of FRR rubber for three hour fire resistance rating.

2.05 FIRESTOP MATERIALS

- A. Use only firestop products that have been UL and ASTM tested for specific fire rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.
- B. Cast-in-place firestop devices are installed prior to concrete placement for use with non-combustible and combustible plastic pipe (closed and open piping systems), or electrical cable bundles, penetrating concrete floors.
- C. Sealants, foams or caulking materials for use with non-combustible items including rigid steel conduit and electrical metallic tubing (EMT).
- D. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including PVC jacketed, flexible cable or cable bundles and plastic pipe.
- E. Foams, intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles.
- F. Non curing, re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles.
- G. Wall opening protective materials for use with UL listed metallic and specified nonmetallic outlet boxes.
- H. Non curing, re-penetrable materials shall be used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways and raceways.
- I. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.

PART 3 EXECUTION

3.01 APPLICATION

- A. Provide sleeves for all conduit penetrations through walls, and through floors where above ground level. Sleeves are not necessary for slab-on-grade penetrations. (Refer to 26 00 30, Concrete Foundations, Supports, and Envelopes, for concrete collar requirements.)
- B. Provide one (1) spare sleeve of equal size in any floor or wall area where more than three (3) conduits penetrate floor or wall.

3.02 INSTALLATION

- A. Sleeves
 - 1. Carefully coordinate and check locations of sleeves immediately before and after each concrete pour and masonry installation.

2. Give the General Trades Contractor locations and sizes of all openings required for the installation of sleeves before construction of masonry or concrete walls is started. If it becomes necessary to cut into new work because of the failure of this Contractor to notify the General Trades Contractor, then the General Trades Contractor shall do any necessary cutting and patching required at this Contractor's expense.
3. Cut sleeves through walls flush with each surface. Unused sleeves shall extend beyond wall surface and be provided with caps.
4. Cut sleeves 3 1/2 inches above finished floors. Joint between sleeve and floor shall be caulked to be watertight. Bottom of sleeve to be cut flush.
5. Core drill holes for sleeves in existing construction.
6. Patching shall be by the General Trades Contractor at this Contractor's expense.

B. Seals and Firestops

1. Clean surfaces and substrates of dirt, oil, loose materials and other foreign materials which may affect the proper bond or installation of seals and firestops.
2. Do not apply seals and firestops to surfaces previously painted or treated with a sealer curing compound or similar product. Remove coatings as required in compliance with Manufacturer's instructions. Provide primers, as required, which conform to Manufacturer's recommendations for various substrates and conditions.
3. Follow Manufacturer's written instructions for installation of seals and firestops.
4. Install firestops with sufficient pressure to fill seal holes, voids and openings to ensure an effective smoke seal and to maintain the fire resistance rating of the assembly.
5. Tool or trowel exposed surfaces. Remove excess firestop material promptly as work progresses and upon completion.
6. Unused sleeves shall be filled with and surrounded by firestop material. Sleeve ends shall be capped. Blind sealing plugs may be used at Contractor's option.
7. Install watertight seals for all below grade penetrations of conduit into the building.

3.03 INSPECTION

- A. Examine seals and firestops to ensure proper installation and full compliance with this Specification. Work shall be accessible until inspection and approval by the applicable code authorities.
- B. Correct unacceptable seals and firestops and provide additional inspection to verify compliance with this specification at no additional cost.

END OF SECTION

SECTION 26 00 70
DEMOLITION

PART 1 GENERAL

1.01 DESCRIPTION

- A. Perform demolition work of all electrical items as shown and/or described on the Drawings. Remove all items from site designated as scrap.
- B. Provide care so as not to damage adjacent construction designated to remain.
- C. All electrical items in good condition are to remain the property of the Owner. The Contractor shall deliver these items to the Owner's designated storage area. Verify with the Owner's Representative which items are considered scrap and are to be disposed of. Any items not retained by the Owner shall be disposed of offsite by the Contractor.

1.02 JOB CONDITIONS

- A. Condition of Structures: The Owner assumes no responsibility for actual condition of structures to be demolished.
- B. Conditions of the structure existing at time of inspection for bidding purposes will be maintained by Owner in so far as practicable. However, variations within structure may occur by Owner's removal and salvage operations prior to start of demolition work. The drawings are schematic and provided as an aid in bidding. The Contractor shall visit the site and determine the actual conditions prior to bidding.
- C. Partial Removal: Items of salvageable value to contractor may be removed from structure as work progresses. Salvaged items must be transported from site as they are removed. Storage or sale of removed items on site will not be permitted.
- D. Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, occupied areas, and other adjacent occupied or used facilities.
- E. Protections: Ensure safe passage of persons around or through area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, and persons.
- F. Install temporary electrical services, lighting, etc. as required by the Owner or authorities having jurisdiction.
- G. Damages: Promptly repair damages caused to adjacent facilities by demolition operations at no cost to owner.
- H. Services: Maintain existing utilities to remain, keep in service, and protect against damage during demolition operations. Allow no interruption in services unless coordinated with Owner at least 24 hours in advance.
- I. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

- J. Contractor will disconnect and seal utilities serving interior area to be demolished, prior to start of demolition work.
- K. If Contractor is required to disconnect services to an occupied area, the Contractor shall provide temporary or alternative service to that area.

PART 2 PRODUCTS - (NOT APPLICABLE)

PART 3 EXECUTION

3.01 DEMOLITION

- A. Coordinate and schedule all work in a careful manner with all necessary consideration for the Owner, neighbors, and the public, avoiding interference with the use of, and passage to and from adjacent areas and facilities designated to remain in use during demolition. Coordinate work with other trades.
- B. Disconnect and remove all items as shown and described on the Drawings completely back to source, including:
 - 1. Luminaires, poles and bases
 - 2. Electrical equipment and pads
 - 3. Devices, boxes and plates
 - 4. Conduit and wires
- C. Maintain all existing circuits to items that are to remain in use. Provide boxes, conduit, conductions, etc., as required.
- D. Existing outlets which are to be removed and have conduits rising from the floor slab shall have the conduits cut below floor level. Rework as required to provide feed-through service to other remaining outlets. Pull new wire between remaining outlets affected by feed-through. Patch floor as required to restore to original condition.
- E. All conduits not embedded in concrete are to be removed. Conduits protruding from concrete shall be cut below floor level. Patch floor as required to restore to original condition.
- F. Abandoned outlet boxes in walls to remain shall be closed with blank coverplates. If equipped with devices, the devices shall be removed and the conductors removed to the adjacent outlet or reconnected as required to provide feed-through service.
- G. Outlet boxes in walls, which are to remain and be resurfaced, shall be removed.
- H. Panelboards flush in masonry walls shall have their bussing removed and a blank steel plate installed over the panelboard cabinet to cover the entire opening.
- I. Disconnect and remove electrical connections to equipment designated to be removed by other Trades.
- J. Abandoned low voltage cables shall be removed. Coordinate with building Owner regarding tagging any for future use.

3.02 RELOCATION

- A. Items designated to be relocated, shall be removed and stored until the construction is ready for their installation.
- B. All luminaires designated to be relocated shall be cleaned and relamped.

3.03 SALVAGE AND SCRAP

- A. Tag and identify all salvageable materials. Coordinate with Owner's Representative all items to be salvaged and store on site as directed. Removal of salvaged and stored items from site is to be by the Owner.
- B. Division 26 Contractor shall remove all scrap items from the building and arrange for disposal in accordance with State and Local regulations.
- C. Disposal of hazardous materials (e.g., luminaire ballasts and lamps) shall be in accordance with Federal and State Environmental Protection Agency regulations. A signed statement signifying proper disposal shall be furnished to the Building Owner in the Record and Information Manuals.

3.04 EXISTING EQUIPMENT TO REMAIN

- A. All electrical items and luminaires designated to remain are to be cleaned and relamped. All outlet boxes shall have knockout plugs installed in unused openings. All panelboards are to have blank covers installed in unused circuit breaker spaces.
- B. All existing outlets, equipment, and associated wiring and conduit systems which interfere with the work of the General Trades, Structural, or Division 21, 22 and 23 Contractors shall be reworked as required to maintain system operation. Relocate conduits where they interfere with new work of other Trades.

END OF SECTION

SECTION 26 00 80
POWER SYSTEM COORDINATION ANALYSIS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Provide a complete documented overcurrent protective device, short circuit current, and time/current coordination analysis for the Normal and Emergency Power Systems, with all circuit breaker settings and fuse characteristics documented for short circuit, high level, low level, and ground-fault coordination. Study to include all equipment and feeders in this building from the utility company service connection point. Include utility company upstream protective devices.
- B. All emergency branch overcurrent protection devices shall have selective coordination up to the emergency and normal power source. Documentation shall clearly demonstrate this with time-current graphs and manufacturer coordination tables. Selective coordination is defined as down to 0.10 seconds.
- C. Provide proper frame size, plug, and trip units of circuit breakers as necessary to achieve selective coordination.
- D. Provide an Arc-Flash Level study indicating energy levels at each piece of electrical equipment.
- E. Provide Available Fault Current study indicating fault current at each piece of electrical equipment and mechanical equipment with overcurrent protection greater than 60 Amps.
- F. Study shall be submitted with the electrical equipment submittal or the submittal will be rejected.
- G. Contractor shall provide all labor and materials to gather data for analysis. This includes but is not limited to lengths, sizes, and quantity of existing and new feeders, sizes and quantities of existing circuit breakers, fuses, or fusible switches, and nameplate data of equipment, circuit breakers and motor data. This also includes data gathering for mechanical equipment.
- H. Power System Coordination Analysis shall include all switchboards, distribution panelboards, panelboards, automatic transfer switches, substations, motor control centers, motors in mechanical equipment, air handling units, chillers, pumps, etc. Existing equipment information shall be obtained by Division 26 Contractor. At completion of project, all new and existing electrical equipment and mechanical equipment with motor controllers or control panels shall be labeled with Arc Flash labels.
- I. Contractor shall obtain all information from the generator manufacturer.
- J. Contractor shall obtain all information from Utility Company.

1.02 QUALITY ASSURANCE

- A. Analysis shall be conducted by overcurrent protection device manufacturer, or authorized agent, using established computer based programs.

1.03 SUBMITTALS

- A. For Review:
 - 1. Draft copy of Coordination Analysis Report
- B. To be included in Record and Information Manuals:
 - 1. Final copy of Coordination Analysis Report

PART 2 PRODUCTS

2.01 REPORT

- A. Provide a neatly bound typewritten report completely describing all settings of overcurrent devices and available fault current in the electrical distribution system. Provide one (1) line diagrams with numerically keyed symbols identifying each device in the report.
- B. Provide COMPOSITE-TIME-CURRENT graphs of all devices including receptacle or circuit breaker ground-fault circuit-interrupters. Only one device in each panelboard needs to be shown where typical of others.

2.02 LABELING

- A. Arc flash labels shall be of printed permanent inked lettering on adhesive plastic material and shall include equipment designation, incident energy level, approach boundary, and PPE requirements.
- B. Available fault current labels shall be of printed permanent inked lettering on adhesive plastic material and shall include equipment designation.

PART 3 EXECUTION

3.01 ADJUSTMENTS

- A. Contractor shall calibrate, adjust and set all adjustable circuit breakers and protective devices in accordance with final analysis.
- B. Label each piece of electrical equipment with Arc-Flash energy level and available fault current.

3.02 TESTING

- A. Provide a functional test of each adjustable circuit and protective device to ensure proper operation prior to initial energization of the power system.

END OF SECTION

SECTION 26 00 99
REQUIREMENTS FOR CONTRACT COMPLETION

PART 1 GENERAL

1.01 DESCRIPTION

- A. The following material must be submitted prior to Contract Completion:
 - 1. Spare parts
 - 2. Record and Information Manuals
 - 3. Accessories and miscellaneous equipment
 - 4. Keys for equipment
- B. Contractor shall use only the attached forms for Material Receipt and System Completion.

1.02 SUBMITTALS

- A. To be included in Record and Information Manuals:
 - 1. Certificate of Material Receipt for all required spare parts
 - 2. Certificate of System Completion for each system when required by individual Division 26 Specifications

PART 2 PRODUCTS

2.01 SPARE PARTS

- A. Furnish spare parts and devices as required by Division 26 Specifications.

PART 3 EXECUTION

3.01 SPARE PARTS AND KEYS

- A. Deliver spare parts and keys to Owner's Representative. Obtain a signed copy of the Certificate of Material Receipt (ATTACHED TO THE END OF THIS SPECIFICATION SECTION).

3.02 MANUFACTURER'S INSPECTION

- A. Arrange for inspection and approval by Equipment Manufacturer where required by Division 26 Specifications. Provide Manufacturer Representative's signature on the Certificate of System Completion (ATTACHED TO THE END OF THIS SPECIFICATION SECTION).

3.03 OPERATIONAL TEST

- A. At completion, Contractor shall operate the systems for a period of at least seven (7) days, to demonstrate fulfillment of the requirements of the Contract. During this time, adjust equipment so that it will perform as the Manufacturer intended, and so that systems will function as designed. Contractor shall sign the Certificate of System Completion (ATTACHED TO THE END OF THIS SECTION).

3.04 EQUIPMENT DEMONSTRATION

- A. After all system operational tests have been completed, schedule an instruction period with the Owner. Instruct designated personnel in the operation and maintenance of all systems and equipment. Use manuals to familiarize Owner with equipment and procedures. Allow time as necessary for this instruction. Schedule a time convenient for the Owner and the Architect. All training sessions shall be videotaped for the Owners use in instructing future employees.

Instruction shall include:

1. Location of all components of the system and explanation of their function
2. Programming procedures for computer-based equipment
3. Maintenance and repair procedures
4. Review of documents in Record and Information Manuals

At the completion of instruction, have all attendees sign the Certificate of System Completion.

END OF SECTION

CERTIFICATE OF MATERIAL RECEIPT

PROJECT NAME: _____

DATE: _____

CONTRACTOR: _____

CONTRACTOR'S REPRESENTATIVE: _____

On the above listed date, the following pieces of equipment, as required by Division 26 Specifications, were delivered to the Owner's Representative:

Equipment	Quantity
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

(Attach a separate page for additional items)

Owner's Representative: _____ (PRINT)

_____ (SIGN)

CERTIFICATE OF SYSTEM COMPLETION

PROJECT NAME: _____

CONTRACTOR: _____

SYSTEM: _____

SPECIFICATION SECTION NUMBER: _____

A. MANUFACTURER'S INSPECTION AND APPROVAL (If required by Specification Section)

The above listed system has been inspected and approved as meeting the Manufacturer's written instructions for installation and operation.

Manufacturer's Representative: _____ Date: _____

B. TESTING

The above listed system has passed all testing required by Division 26 Specifications and has met the terms of the Contract. Written test results are attached.

Contractor's Representative: _____ Date: _____

C. EQUIPMENT DEMONSTRATION

The above listed system has been demonstrated to the following Owner's Representatives:

	<u>NAME</u>	<u>TITLE</u>	<u>DATE</u>	<u>SIGNATURE</u>
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

(ATTACH A SEPARATE PAGE FOR ADDITIONAL NAMES)

SECTION 26 05 10
WIRE AND CABLE

PART 1 GENERAL

1.01 DESCRIPTION

- A. Furnish and install all electrical conductors for service entrance, feeder and branch circuit wiring and control wiring.
- B. Refer to other Division 26 Specification Sections for additional wiring requirements.

1.02 QUALITY ASSURANCE

- A. Wire and cable furnished shall be in accordance with the following standards where applicable:
 - 1. UL Standard 44 for rubber insulated wires and cables
 - 2. UL Standard 83 for thermoplastic insulated wires and cables
 - 3. UL Standard 1569 for Type MC and HCF cable
 - 4. UL Standard 817 for flexible cords and cables
 - 5. NEMA WC 70 / ICEA S-95-658
- B. Wire and cable shall be in accordance with applicable NEC Articles.
- C. Wire and cable shall be identified by surface markings indicating manufacturer, size, metal type, voltage rating, UL listing and cable type.

1.03 SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: Indicate type, use, location, and termination locations.
- C. Field quality-control reports.

1.04 MANUFACTURERS

Subject to compliance with requirements, provide products by one of the following:

- A. Conductors
 - 1. Cerrowire LLC
 - 2. Encore Wire Corporation
 - 3. General Cable, Prysmian Group
 - 4. The Okonite Company
 - 5. Service Wire Company
 - 6. Southwire Company
- B. Connectors and Splices
 - 1. Burndy, Hubbell
 - 2. Ideal Industries, Inc.
 - 3. ILSCO

- C. Metal-Clad Cable, Type MC or HCF
 - 1. AFC Cable Systems, Atkore International
 - 2. Encore Wire Corporation
 - 3. Northern Cables
 - 4. The Okonite Company
 - 5. Omni Cable
 - 6. Southwire Company
 - 7. RSCC VITALink Marmon Wire and Cable
 - 8. Draka Lifeline, Prysmian Group

PART 2 PRODUCTS

2.01 TYPE "THHN/THWN-2" WIRING

- A. Wire shall be single conductor annealed uncoated copper with PVC insulation and nylon jacket. Insulation shall be heat and moisture resistant with light stabilized jacket. Wire shall be rated 600 volt, 90 degree C in dry locations, 75 degree C in wet locations.
- B. Conductors No. 10 AWG and smaller may be solid; No. 8 AWG and larger shall be stranded. Where stranded conductors of sizes 12 and 10 are used, appropriate crimp terminations shall be provided on the ends of each conductor for making connections to wiring devices, switches, etc.

2.02 TYPE "XHHW-2" WIRING

- A. Wire shall be single conductor annealed uncoated copper with heat and moisture resistant thermosetting cross-linked polyethylene insulation. Wire shall be rated 600 volt, 90 degree C in dry locations, 75 degree C in wet locations.
- B. Wire shall be single conductor, uncoated aluminum with XLPE insulation and compressed compacted stranded conductor. Aluminum shall be General Cable Stabiloy AA-8030 alloy, or equal by Southwire.

2.03 TYPE "SOW-A" CORD

- A. Cord shall be extra hard usage duty with flexible stranded copper conductors with 90 degree C EP rubber insulation enclosed by a 90 degree C thermosetting jacket that is resistant to oil, ozone, abrasion, and high temperature. Cord shall have a 600 volt rating.

2.04 TYPE "MC" METAL-CLAD CABLE or HCF HOSPITAL GRADE

- A. Three (3) conductor (thermosetting cross-linked polyethylene) insulated, aluminum or galvanized steel interlocked armor Type MC power cable for use in circuits not exceeding 600 volts phase to phase at conductor temperatures of 90 degrees C in wet or dry locations for normal operation, 130 degrees C for emergency overload conditions and 250 degrees C for short circuit conditions. Cable is intended for installation indoors or outdoors, aerially, in metal rack, trough or cable trays, or for direct burial.
- B. Cable assembly shall include full-size grounding conductor with suitable fillers and binder tape.

- C. Type HCF cable shall have redundant grounding by an interlocked armor assembly with bare aluminum bonding conductor and green insulated copper grounding conductor. Jacket shall be green.
- D. Type "MC" and "HCF" cable shall be of the single circuit type only, used for branch circuits. Fire resistive cable assemblies shall comply with UL2196.

2.05 CONNECTORS AND SPLICES DESCRIPTION

- A. Factory-fabricated connectors splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated.
- B. Splices in No. 10 AWG and smaller wire shall be made with insulated connectors with metallic coil springs and contoured wings such as 3M "Scotchlok," Ideal Company "Wing Nut," Thomas & Betts Company "Piggy" connectors, or with mechanically-crimped sleeves as manufactured by T & B or Ideal Company, which shall be insulated with pressure sensitive vinyl plastic electrical tape equal to Scotch No. "33" or No. "88." Push wire or incline connectors are not acceptable.
- C. All taps, terminations or splices, size No. 8 and larger shall be made with bolted-type pressure or compression connectors. Connectors shall be compatible with the conductor material. Insulate connectors with electrical tape to 150% of the insulating value of the conductor insulation. The tape shall have insulating properties equivalent to the conductor.
- D. All splices located in exterior junction boxes shall be made with waterproof splice kits.
- E. Lugs shall be one piece, seamless, designed to terminate conductors specified in this Section. Material shall be compatible with the conductor material. Two hole with standard barrels and compression terminations.

PART 3 EXECUTION

3.01 APPLICATION

- A. Service entrance conductors for underground installations in raceways shall be Type "XHHW-2."
- B. All branch circuits, feeders and control wiring shall be Type "THHN/THWN-2."
- C. Unless otherwise noted, minimum wire size for power branch circuits shall be No. 12 AWG and for control and auxiliary systems No. 14 AWG. Wire size for branch circuit homeruns shall be as indicated in the panelboard schedules. Remainder of branch circuit shall be No. 12 AWG, unless noted otherwise.

- D. Type "MC" cable may be used for normal power concealed branch circuit wiring in dry locations above ceilings between luminaires and in walls between outlets. Homeruns, multi-wire branch circuits, circuit runs with multiple circuits and special purpose outlets shall occur in conduit. Conversion from "MC" cable to conduit shall occur within 10 feet of first utilization device connection to circuit. The use of Type "MC" cable for emergency branch circuits is not permitted. "MC" cable shall not be used in healthcare related facilities, or spaces.
- E. Type HCF cable may be used for normal power concealed branch circuits for patient care areas or for circuits in Places of Assembly or Theatres.
- F. Type "SOW-A" shall be used for cord drops and portable appliance connections such as make up connections to shop or kitchen equipment. Hard service cord with stainless steel, wire mesh, strain relief device at terminations to suit application.
- G. All conductors shall be copper, unless specifically noted on the Drawings, where conductors may be aluminum XHHW-2 wiring. Terminations on both ends shall be made with aluminum alloy, long barrel, one or two holes, high compression crimp lug connectors on cleaned ends protected with anti-corrosion joint compound. Cable ampacity and conduit size shall be in accordance with National Electrical Code tables. All switchboards, panelboards, safety switches, transformers, etc. shall come factory prepared with appropriate bus terminators to accept high compression crimp lug connectors. Equipment shall have sufficient wire bending space.
- H. Aluminum conductors shall only be used for feeders to electrical equipment.
- I. Provide "Edison Heart" cable expansion loops at cable terminations into equipment lugs where conduits may be subject to expansion and contraction due to exposure to temperature variations or where conduits may be below grade and subject to frost heave.

3.02 INSTALLATION

- A. Install electrical cables, wires and connectors as indicated, in compliance with Manufacturer's written instructions, applicable requirements of NEC and NECA'S "Standard Installation," and in accordance with recognized industry practices.
- B. Coordinate cable and wire installation work with electrical raceway and equipment installation work, as necessary for proper interface.
- C. No wire may be pulled until masonry and concrete is in place. Free ends and loops at boxes and enclosures are to be pushed back in box and protected by blank covers or other means until the interior painting and decorating work is completed.
- D. Leave at least 6 inches of free conductor at all outlets except where conductors are intended to loop without joints through outlets for luminaires or wiring devices hookups.

- E. Wire color and code shall be used as follows:

	120/208 Volt	277/480 Volt
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green
Isolated Ground	Green w/White Stripe	

- F. All circuits shall have separate neutral conductors run for each phase conductor. Provide separate neutral conductor between each dimmer and load.
- G. Number of branch circuit conductors in a conduit including switch legs and neutral conductors shall not exceed nine (9) conductors. Conductors shall be derated in accordance with NEC Article 310 when more than three (3) current carrying conductors are installed in a raceway.
- H. Branch circuits shall be connected as numbered on the Drawings. Test and permanently tag by circuit number each circuit phase conductor in panelboard gutter before connecting to panelboard. Numbered adhesive tapes may be used at Contractor's option. Group neutral conductor and associated phase conductors with cable ties.
- I. Where a feeder or branch circuit exceeds the terminating lug size, the Contractor shall use an appropriate adapter fitting to reduce cable size. Cutting of conductor strands is not permitted.
- J. Use pulling means, including fish tape, cable or rope, and manufacturer approved compound or lubricant which will not damage raceway or deteriorate insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- K. Branch circuit conductor splices shall be kept to a minimum. Feeder conductors shall have no splices.
- L. Any equipment having multiple power connections shall have a warning label attached to each source where it connects to the equipment.
- M. Subsequent to wire and cable hookups, energize circuitry and demonstrate functioning in accordance with requirements.
- N. Division 26 Contractor shall provide cords and plugs for equipment furnished by General Trades Contractor which is intended or shown for connection to a receptacle but not furnished with the equipment.
- O. Type MC or HCF cable shall be supported and secured at intervals not exceeding 6 feet with approved steel or malleable iron cable straps, clamps or hangers. Install "anti-short" bushings on all MC cable ends.

- P. Cables shall be supported inside of conduits and pullboxes as required by NEC in vertical risers. Provide pullboxes located as required – coordinate locations with Owner's representative.
- Q. Each conduit in a parallel run shall contain all phases and neutral and equipment grounding conductors as a set. Phase conductors shall not be run in separate conduits.

3.03 CONDUCTOR SIZING

- A. Branch circuit conduit routing is not shown on the plans and is left to the discretion of the Contractor. Minimum wire size for 20A, 120 volt branch circuits shall be as follows, unless specifically noted on the Drawings:

<u>Conductor Size</u>	<u>Maximum Conductor Length</u>
#12 AWG	100 feet
#10 AWG	150 feet
#8 AWG	250 feet
#6 AWG	400 feet

- B. Wire size for under floor ducts shall be #8 AWG (minimum).
- C. Do not purchase nor install cabling to equipment with VFD's until lug size can be verified with actual equipment submittals. If cabling size shown is larger than the lug can accommodate, provide a disconnect switch or wireway at equipment and reduce cabling to maximum size that fit into the lugs.

3.04 TESTING

- A. Refer to Section 26 08 40, "Electrical Tests, Adjustments, Inspection."
- B. Prior to energization, test cable and wire for continuity of circuitry and for short circuits.

END OF SECTION

SECTION 26 05 26
GROUNDING & BONDING (EXTENSION)

PART 1 GENERAL

1.01 DESCRIPTION

- A. Furnish and install a complete Grounding system extension as shown on the Drawings and specified herein. Provide all accessories as necessary for a complete system.
- B. All components of the electrical system shall be grounded and bonded including: raceways, enclosures, receptacles, motors, controllers, panelboards, contactors, luminaires, telephone systems, and all other electrical components and subsystems.

1.02 REQUIREMENTS

- A. The Division 26 Contractor shall work with the Division 27 Contractor. The Division 26 Contractor shall be responsible for the grounding system and include the telecommunications grounding listed in 26 05 27, Section 1.02.B.1. All applicable requirements listed in 26 05 27 shall be provided.

1.03 QUALITY ASSURANCE

- A. All equipment shall be UL listed and labeled and in accordance with applicable NEMA and ANSI Standards and NEC Article 250.
- B. Comply with UL 467 for grounding and bonding material and equipment.

1.04 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Coordination Drawings: Plans showing dimensioned locations of grounding features including, but not limited to the following:
 - 1. Test wells.
 - 2. Grounding rods.
 - 3. Ground rings.
 - 4. Grounding arrangements and connections for separately derived systems.
- C. Field Quality Control Reports

1.05 MANUFACTURERS

Subject to compliance with requirements, provide products by one of the following:

- A. Burndy, Hubbell
- B. ERICO, nVent
- C. Harger Lightning & Grounding
- D. ILSCO

- E. O-Z/Gedney, Emerson Electric Co.
- F. Thomas & Betts, ABB Group

PART 2 PRODUCTS

2.01 CONDUCTORS, CLAMPS AND CONNECTORS

- A. Insulated Conductors: Refer to Specification Section 26 05 10, "Wire and Cable."
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B3.
 - 2. Stranded Conductors: ASTM B8.
 - 3. Tinned Conductors: ASTM B31.
 - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 - 6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
 - 7. Tinned Bonding Jumper: Tinned copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

PART 3 EXECUTION

3.01 INSTALLATION

- A. System Grounding Connections
 - 1. All separately derived alternating current systems, such as 480 volt delta to 208/120 volt wye transformers, UPS systems, etc. shall be grounded and bonded as required in NEC Article 250.30.
- B. Enclosure and Equipment Grounding
 - 1. Metal enclosures or raceways for conductors or equipment shall be grounded.
 - 2. Exposed noncurrent-carrying metal parts of fixed equipment likely to become energized shall be grounded.
 - 3. Exposed noncurrent-carrying metal parts of switchboard frames and structures, motor frames, enclosures for motor controllers, and lighting fixtures shall be grounded.
- C. Method of Grounding
 - 1. Provide separate green insulated equipment grounding conductors with all feeders and branch circuits.
- D. Bonding
 - 1. Bonding shall be provided and conform to all requirements of NEC Article 250, Parts V and VII.
 - 2. Bond panelboards in healthcare facilities serving the same individual patient care vicinity in accordance with NEC 517.14.

- E. Exterior luminaires and poles shall be grounded by the use of a manufacturer supplied ground lug or pigtail or by the use of ground clips fastened in bare metal that is free of paint. Poles shall be grounded to an equipment grounding conductor. Poles shall also have a driven ground rod installed at the bottom of their base excavation and bonded to pole.
- F. Separately derived systems, such as transformers, shall be grounded to the nearest building steel column. If building steel is not available, then ground to the nearest domestic cold water pipe. In addition, run a grounding electrode conductor back to the main service entrance ground point. Grounding electrode conductor shall be bonded to conduit at each end.
- G. Motor terminal boxes shall be grounded by the use of a manufacturer supplied ground lug or by drilling and tapping a hole for a ground screw. Remove paint prior to making the connection.
- H. Metal roofing and metal veneer siding shall be bonded to building steel or nearest grounding system connection with a No.6 AWG copper conductor every 100 feet.
- I. A No. 2 AWG copper ground jumper shall be installed around water meters and water heaters.
- J. Metal piping systems such as compressed air, natural gas, lab gases, vacuum, hot water, heating and chilled water HVAC systems, shall all be bonded to the grounding electrode system with No. 6 AWG copper conductors.

END OF SECTION

SECTION 26 05 29
HANGERS AND SUPPORTS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Furnish and install complete hangers, supports and concrete inserts as required for the installation of conduits, cabinets, transformers and equipment installed under Division 26.
- B. Provide all beam clamps, expansion anchors, threaded rod, framing steel and hardware as required.

1.02 QUALITY ASSURANCE

- A. All equipment shall be UL listed and labeled and in accordance with applicable NEMA and ANSI Standards.

1.03 MANUFACTURERS

- A. Hangers, Supports and Inserts
 1. GTE/Unistrut International Inc.
 2. Flex-Strut
 3. Kindorf/Midland Ross Corporation
 4. Grinnell
 5. Tufstrut - Pilgrim Technical Inc.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Conduits or raceways shall be securely supported and anchored with proper devices, using lead shields in walls or sides of beams, expansion shields or other approved type device for direct down-pull loads. Minerallac type hanger shall be limited to above ceilings. Holes made in walls or ceilings for use with anchoring devices shall be covered by large steel washers. Include special hangers, as required. Minerallac type fittings shall not be permitted within 8 feet of the floor surface where exposed raceways are installed.
- B. Hangers shall be individual ring or clevis type, one hole straps or multiple trapeze hangers.

2.02 STRUCTURAL ATTACHMENTS

- A. Concrete: Use Grinnell Fig. 285, or equal, Light Weight concrete insert for loads up to 400 lbs., or Grinnell Fig. 282, or equal, Universal Concrete insert for loads up to 1430 lbs.
- B. Steel Beams: Where pipe size is 2 inches or less, use Grinnell Figure 87 or equal, Malleable iron C-Clamp and Retaining Clip. Where pipe size is over 2 inches, use Grinnell Figure 229, or equal.
- C. Intermediate Attachments: Continuous threaded rod shall be used wherever possible. No chain, wire or perforated strap shall be used. Up to 2 inches trade size pipe use 3/8 inch (minimum) rod, 2 1/2 inches and larger use 1/2 inch (minimum) rod.

- D. Pipe Attachments: For steel pipe use Grinnell Figure 115 Ring and Turnbuckle Adjuster, or Figure 260 Clevis.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Conduits shall be supported to meet the conditions as required using proper type and size straps, clamps, and hangers.
- B. Exposed conduits shall be installed parallel with or at right angles to building structure, fastened at least every 8 feet and at both sides of each outlet, except at one side only of conduit terminating outlets. Conduits shall be installed tight to structure and beams/joists. Coordinate exposed conduit routing with Architect prior installation.
- C. Conduit risers shall be supported with friction clamps with two point bearing anchored to building construction and at every floor.
- D. The following hanger methods are not permitted:
 - 1. Wood plugs
 - 2. Perforated band iron
 - 3. Hook chain supports
 - 4. Bailing wire, etc.
 - 5. Minerallacs where previously mentioned
 - 6. Friction type clamps, such as hammer on clips
- E. Whenever possible, use supports, clamps, hangers, etc., designed especially for the equipment to be installed.
- F. The maximum permitted load on hanger rod, plain or all-thread, shall be as follows:
 - 1. 1/4 inch size - 750 pounds
 - 2. 3/8 inch size - 1000 pounds
 - 3. 1/2 inch size - 2000 pounds
 - 4. 5/8 inch size - 3000 pounds
 - 5. The minimum size hanger rod permitted is 1/4 inch size.
- G. Any supports exposed to weather, shall be cleaned, primed and painted.

END OF SECTION

SECTION 26 05 33
CONDUIT AND FITTINGS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Provide complete grounded conduit systems for all electrical conductors.
- B. All conduits shown on the Drawings shall meet NEC fill requirements for the conductors enclosed.
- C. Conduit raceway systems shall be made mechanically tight and electrically continuous throughout. All metal raceway systems shall be grounded.
- D. Refer to Section 26 05 43, "Underground Raceways" for all conduits located within or below slab-on-grade floors, and exterior to the building foundation.

1.02 QUALITY ASSURANCE

- A. All equipment shall be UL listed and labeled and in accordance with applicable NEMA and ANSI Standards.
- B. Conduit shall be in accordance with applicable NEC Articles.

PART 2 PRODUCTS

2.01 RIGID (RMC) AND INTERMEDIATE METAL CONDUIT (IMC)

- A. Conduit shall be steel, hot dipped zinc galvanized (minimum 0.0008 inch thick) inside and out, with circular cross section, uniform wall thickness, continuously welded seams and chamfered threaded ends. Conduit shall be furnished in 10 foot standard lengths.

2.02 ELECTRICAL METALLIC TUBING (EMT)

- A. EMT shall be zinc galvanized (minimum 0.0008 inch thick) inside and out, with circular cross section, uniform wall thickness and continuously welded seams. EMT shall be furnished in 10 foot standard lengths.

2.03 FLEXIBLE METAL CONDUIT (FMC)

- A. Conduit shall be steel or aluminum, hot dipped zinc galvanized inside and out and made from one continuous length of high grade strip of uniform weight and thickness shaped into interlocking convolutions with smooth interior and exterior surfaces. Conduit shall be provided in standard coil lengths.

2.04 LIQUID-TIGHT FLEXIBLE METAL CONDUIT (LFMC)

- A. Conduit shall be hot dipped zinc galvanized inside and out and made from one continuous length of high grade steel strip of uniform weight and thickness shaped into interlocking convolutions with smooth interior and exterior surfaces. Conduit shall be provided in standard coil lengths.

- B. Conduit shall have a continuous PVC jacket enclosing it.

2.05 REINFORCED THERMOSETTING RESIN CONDUIT (RTRC)

- A. The conduit shall be fiberglass conduit, also known as Reinforced Thermosetting Resin Conduit (RTRC), manufactured using the single circuit filament winding process. Multi circuit windings are not allowed. UL 2515 listed for above ground installation. The conduit shall have a winding angle as close as possible to 54.75 degrees. Winding mandrels shall be straight and true so as to produce a non-tapered conduit. Tapering is allowed at the belled end. The internal conduit and elbow walls shall be smooth, and all fibers embedded in the epoxy.
- B. The resin system shall be epoxy based, without fillers using an anhydride curing agent. The fiberglass shall consist of continuous E-glass Grade "A" roving. All additive for increasing flame spread and lowering smoke density shall be halogen free, i.e. not contain chlorine or bromine and shall meet NEMA TC 14 Standards.
- C. Carbon black shall be used as ultra violet inhibitor to protect the conduit and fittings during storage and exposure to the outdoors. Conduit and elbows shall be black in color.
- D. A two-part adhesive, epoxy resin system designed to permanently bond fittings and joints of conduit shall be properly mixed and applied at manufacturer specified ambient temperatures.

2.06 CONDUIT FITTINGS

- A. All RMC, IMC, and EMT fittings shall be galvanized steel. Connectors and couplings shall be threaded, set screw or compression type, concrete-tight.
- B. Conduit bodies shall be threaded steel type. Provide neoprene cover gaskets for conduit body covers exposed to the weather.
- C. Expansion fittings shall be O-Z/Gedney Type "AX" or "TX". Use for any conduit where exposed to the sunlight and subject to temperature expansion/contraction. Provide O-Z/Gedney Type "BJ" bonding jumpers at all expansion fittings.
- D. Sealing fittings shall be Crouse Hinds Type EYD or Appleton Type EYD, with drain.
- E. RMC and IMC conduit bushings shall be of the insulated type with phenolic thermosetting insulation molded to a hot dipped galvanized steel body of the threaded type.
- F. EMT fittings shall be of the insulated throat type. Fittings larger than 2 1/2 inches shall have threaded bushings installed as described in Paragraph E above.
- G. Conduits larger than 1 inch shall have grounding type bushings.

- H. Fiberglass conduit fittings, elbows, and accessories shall be manufactured using one of two manufacturing procedures. The first method shall use the same process, methods, and components as used to manufacture the fiberglass conduit. The second method shall use the compression molding process, Sheet Molding Compound (SMC) for the manufacture of the finished component. The SMC material shall be a vinyl ester resin with +30% reinforcement of glass. The glass fibers should be approximately 1 inch in length. The SMC material shall be fire resistant to UL 2515 specifications and shall be halogen free. Plastic duct plugs shall be manufactured from PVC.

2.07 ROOF PENETRATIONS

- A. Use prefabricated pipe flashing of ultra-violet resistant EDPM rubber with ribbed aluminum base.
- B. Pate, Shipman, or Thy-Curb.

2.08 ROOF SUPPORTS

- A. Rooftop conduit supports shall be UL listed for glue down installation.

PART 3 EXECUTION

3.01 APPLICATION

- A. All conduit shall be rigid metal conduit, unless noted otherwise below, minimum 3/4 inch trade size.
- B. EMT may only be used in these locations:
 - 1. Within interior partitions and exterior walls
 - 2. Above suspended ceilings inside building
 - 3. Exposed above 9 feet A.F.F. inside building (except in wet, hazardous, or corrosive locations)
 - 4. Exposed above electrical equipment in electrical and mechanical rooms.
- C. Intermediate metal conduit may be used at the Contractor's option in lieu of rigid steel conduit within the building interior.
- D. Flexible metal conduit up to 6 feet in length shall be used for connections to lighting fixtures. A green grounding conductor shall be installed in each flexible conduit as specified in Section 26 05 26, "Grounding." All runs shall be terminated in insulated flexible conduit fittings in accordance with NEC. Minimum size to be 1/2 inch.
- E. Liquid tight flexible metal conduit (up to 3 feet in length) and appropriate fittings shall be used for connections to motors, engine/generators, and vibrating equipment. A green grounding conductor shall be installed in each flexible conduit as specified in Section 26 05 26, "Grounding." All runs shall be terminated in insulated flexible conduit fittings in accordance with NEC. Minimum size to be 1/2 inch.
- F. All conduit used for conductors above 600 volts, within building shall be rigid metal conduit.

- G. All conduit used in fire pump rooms shall be rigid metal conduit, unless Type MI cable is used.
- H. EMT shall not be installed on the underside of metal roof decking.
- I. RMC conduit shall be used on roofs with appropriate expansion fittings.

3.02 INSTALLATION

- A. Generally, all conduits shall be concealed with runs installed parallel and perpendicular to walls and floor. Exposed conduits below 9 feet will be permitted only in electrical and mechanical rooms. Anywhere else at the discretion of the Architect or where specifically noted on the Drawings. In these cases, install conduit escutcheon plates around conduit penetration, sized to cover the conduit sleeve. Submit proposed routing of exposed conduits in finished spaces with Architect prior to installation.
- B. Branch circuit conduits shall not be run within concrete floors except for short runs to floor boxes.
- C. Conduit shall be securely and rigidly fastened in place with approved pipe straps, wall brackets, conduit clamps, conduit hangers, threaded C-clamps, or ceiling trapeze. C-clamps and beam clamps shall have strap or rod-type retainers.
- D. Conduit support fastenings shall be by:
 - 1. Wood screws to wood
 - 2. Toggle bolts in hollow concrete masonry units
 - 3. Expansion bolts in concrete or brick
 - 4. Machine screws, welded threaded studs on steel work
 - 5. Nail-type nylon anchors or threaded studs driven by a powder charge and provided with lock washers and nuts for concrete, brick or steel work
 - 6. Conduit shall not be supported using wire or nylon ties.
- E. In areas without ceilings, conduits shall be run as high as possible attached to the structure of the roof, or of the floor deck above. Do not attach directly to the metal deck. Conduits shall be run next to walls as inconspicuously as possible. In finished areas exposed to public view without ceilings, all work shall be installed in an aesthetically acceptable manner. The Architect reserves the right to require the Contractor to make changes as necessary to equipment installation that is unsuitable for public view due to poor workmanship.
- F. Install conduit sleeves for all conduit penetrations through floors, masonry walls, and fire rated walls. Refer to Section 03 30 00, "Concrete" for spacing requirements. Sleeves shall be spaced a sufficient distance apart to maintain fire ratings as required by the UL Fire Resistance Construction Manual.
- G. Conduit shall be independently supported from elements of the building and shall not rest on, nor be supported from suspended ceilings. Boxes shall be fastened to structure independently from conduit system. Conduits shall not be attached to metal decking forming the roof or floor slab above.
- H. Do not install conduits within poured concrete construction above grade, unless to flush floor outlets.

- I. Lay out conduit system to avoid crossing building expansion joints. Where crossings are necessary, use expansion fittings.
- J. All conduits shall be continuous from outlet to outlet or junction box, and installed complete before pulling conductors. Swab conduits free of dirt, grease and moisture before pulling conductors.
- K. Install bushings on all RMC and IMC conduit ends. Install insulated throat fittings on all EMT conduit ends. Fasten conduit to boxes and cabinets using locknuts. Provide two (2) locknuts where required by the NEC, where insulating bushings are used and where bushings cannot be brought into firm contact with the box.
- L. All conduits entering or leaving refrigerated, subject to different temperatures or moisture-laden spaces shall be sloped away from equipment and secured with sealing fittings. Secure conduits with threaded hubs to prevent air circulation and condensation.
- M. Do not install conduits beneath nor above equipment generating heat such as boilers, heat exchangers or water heaters.
- N. Provide a high strength pull cord in all empty conduits, and cap ends.
- O. Maintain minimum clearances of 6 inches from parallel hot water piping and 4 inches from crossovers.
- P. Provide conduit sleeves, seals and firestops in accordance with Section 26 00 55, "Sleeves, Seals and Firestops."
- Q. Provide expansion fittings in all conduit runs on roofs, and exterior to building above grade. Provide expansion fittings within 3 feet above grade where conduits run up and out of the ground into panelboards, CT cabinets, mechanical HVAC equipment panels, etc to allow for cable expansion slack. Cabling shall have "Edison Hearts" expansion loops at the terminations to provide cable slack for expansion.
- R. Provide proper roof flashing and sealing to match roof material when penetrating roofs.
- S. Install cable wedging plug type supports in all vertical conduit runs as required by NEC.
- T. All conduits in hazardous locations shall be sealed in accordance with NEC Articles 500, 501, 502, and 503.
- U. Do not exceed four (4) 90 degree bends in any conduit run without a pulling point. Provide pullboxes as required. Locate pullboxes in accessible areas. Coordinate locations with all other building Trades.
- V. Roof support steel shall be galvanized.

END OF SECTION

SECTION 26 05 34
OUTLET BOXES

PART 1 GENERAL

1.01 DESCRIPTION

- A. Outlets shall be provided for devices, luminaires, motors, and equipment connections, systems equipment connections, special outlets, and as otherwise required.
- B. Outlet boxes shall be of sufficient size to provide free space for all conductors enclosed in the box. Boxes shall be not less than the minimum size required by NEC Article 314 for the number and size of conductors contained within.

1.02 QUALITY ASSURANCE

- A. All equipment shall be UL listed and labeled and in accordance with applicable NEMA and ANSI Standards.

PART 2 PRODUCTS

2.01 OUTLET BOXES

- A. Interior Outlet Boxes: Provide galvanized flat rolled sheet steel interior outlet wiring boxes, of types, shapes and sizes, including box depths, to suit each respective location and installation; construct with stamped knockouts in back and sides, and with threaded screw holes with corrosion-resistant screws for securing box covers and wiring devices.
- B. Interior Outlet Box Accessories: Provide outlet box accessories as required for each installation, including mounting brackets, wallboard hangers, extension rings, fixture studs, cable clamps, and metal straps for supporting outlet boxes, which are compatible with outlet boxes being used and fulfilling requirements of individual wiring situations. Choice of accessories is Installer's option.
- C. Weatherproof Outlet Boxes: Provide corrosion-resistant cast aluminum, weatherproof outlet wiring boxes, of types, shapes and sizes, including depth of boxes, with threaded conduit ends, cast-metal face plates with spring-hinged waterproof caps suitably configured for each application, including face plate gaskets and corrosion-resistant fasteners.
- D. Luminaire outlet boxes shall be standard 4 inch octagonal, minimum 1 1/2 inches deep.
- E. Flush device boxes in masonry walls to be masonry boxes designed for the purpose, or 4 inch square boxes with raised covers designed for masonry.
- F. Wiring device boxes for surface conduit work and located in potentially damp areas shall be FS series cast aluminum boxes.
- G. Where outlet boxes are to be cast in concrete slabs, they shall be boxes designed for concrete installation.

- H. Flush device boxes shall be 4 inch square, 2 1/8 inch deep boxes with plaster covers or gangable 2 1/2 inch deep boxes. Shallow 1 1/2 inch deep gangable boxes may be used only in demountable partitions and in other walls too thin for standard depth boxes.
- I. Low voltage boxes are identified in Section 26 05 35, "Low Voltage Outlet Boxes".

PART 3 EXECUTION

3.01 INSTALLATION

- A. All outlet boxes upon which luminaires are to be installed shall be equipped with 3/8 inch fixture studs. All outlet boxes shall be installed vertically plumb within 3 degrees.
- B. All boxes shall be rigidly supported from building structure independent of the conduit system. Boxes cast into masonry or concrete are considered to be rigidly supported. Framing members of suspended ceiling systems shall not be permitted as a support.
- C. Flush boxes shall finish within 1/4 inch of surface of non-combustible materials. Boxes shall not project beyond finished surfaces.
- D. Flush luminaires in lay-in ceilings shall have branch circuit conduit terminated in a junction box above ceiling, but accessible through ceiling opening and located at least one foot away from the luminaire. Pre-wired incandescent luminaires may have the branch circuit conduit terminate in the luminaire junction box provided the box is sized sufficient for the wire and UL labeled for 90 degrees C wire.
- E. Locations of all outlets are approximate. Final location shall be verified with the Architect in the field prior to installation.
- F. Install knockout closures for unused openings.
- G. Outlet boxes installed on opposite sides of a fire rated wall shall have a minimum of 24 inch spacing between adjacent boxes.
- H. All outlet boxes shall use stud to stud box brackets with far side supports.
- I. "Through-wall" type boxes shall not be used.
- J. Boxes shall not be installed in a "back-to-back" manner. Boxes shall be spaced at least 10 inches apart where in opposite walls within the same stud cavity, unless a sound absorptive barrier is placed between boxes.

END OF SECTION

SECTION 26 05 35
LOW VOLTAGE OUTLET BOXES

PART 1 GENERAL

1.01 DESCRIPTION

- A. Low Voltage Outlet boxes shall be provided for IT devices, AV devices, security devices, special technology outlets, and as otherwise required.
- B. Low Voltage Outlet boxes shall be of sufficient size to provide free space for all conductors/cables enclosed in the box and to not exceed the minimum bend radius for any cable. Boxes shall be not less than the minimum size required by NEC Article 314 for the number and size of conductors contained within.

1.02 QUALITY ASSURANCE

- A. All equipment shall be UL listed and labeled and in accordance with applicable NEMA and ANSI Standards.

1.03 SUBMITTALS

- A. For Review:
 - 1. Product data sheets
 - 2. Layout drawings for television and monitor outlet box locations
- B. To be included in Record and Information Manuals:
 - 1. One (1) copy each of approved submittal

PART 2 PRODUCTS

2.01 LOW VOLTAGE OUTLET BOXES

- A. Flush device boxes in masonry walls to be masonry boxes designed for the purpose with raised covers designed for masonry.
- B. Where outlet boxes are to be cast in concrete slabs, they shall be boxes designed for concrete installation.
- C. Flush boxes for data / voice cabling shall be 4 11/16 inches square by 2 1/8 inches deep with one (1) gang plaster ring installed. Outlet boxes shall accommodate 1 inch conduit as required.
- D. Unless otherwise noted, all television and monitor locations with a TV symbol on the technology drawings shall use an in-wall storage box for both power and low-voltage. This box is intended to provide an organized, recessed space for routing excess cables and for attaching surge protectors/power conditioners or other interface devices. Basis of design is Chief PAC525FW Series (white in color and flange included) with equivalents by Leviton, Hubbell, FSR, and Peerless. All TV locations on the drawings that are designated as future monitors shall have cover furnished and installed (Basis of design is Chief PAC525FCW Series).

- E. Unless otherwise noted, all other television and monitor locations (e.g., those typically with a monitor data symbol) on the technology drawings shall use a recessed TV box for both power and low-voltage. Basis of design is Legrand TV2MW with equivalents by Leviton, Hubbell, Carlon, and Arlington.
- F. Flush boxes for audio / video cabling (other than television and monitor locations) shall be 4 11/16 inches square by 3 1/4 inches deep with one (1) gang plaster ring cover installed. Coverplates shall be blank stainless steel. Outlet boxes shall have knockouts for 1 1/4 inch conduits, and knockouts for up to 2 inch conduits as required.
- G. Flush boxes for security cabling 4 11/16 inches square by 2 1/8 inches deep with one (1) gang plaster ring cover installed. Coverplates shall be blank stainless steel. Outlet boxes shall accommodate 3/4 inch conduits as required.
- H. Flush boxes for nurse call cabling shall be sized per manufacturer recommendation for each device type. Outlet boxes shall accommodate minimum 3/4 inch conduits as required.

PART 3 EXECUTION

3.01 INSTALLATION

- A. All boxes shall be rigidly supported from building structure independent of the conduit system. Boxes cast into masonry or concrete are considered to be rigidly supported. Framing members of suspended ceiling systems shall not be permitted as a support.
- B. Flush boxes shall finish within 1/4 inch of surface of non-combustible materials. Boxes shall not project beyond finished surfaces.
- C. Locations of all outlets are approximate. Final location shall be verified with the Architect in the field prior to installation.
- D. Install knockout closures for unused openings.
- E. Outlet boxes installed on opposite sides of a fire rated wall shall have a minimum of 24 inch spacing between adjacent boxes.
- F. All outlet boxes shall use stud to stud box brackets with far side supports.
- G. "Through-wall" type boxes shall not be used.
- H. Boxes shall not be installed in a "back-to-back" manner. Boxes shall be spaced at least 10 inches apart where in opposite walls within the same stud cavity unless a sound absorptive barrier is placed between boxes.

END OF SECTION

SECTION 26 05 36
PULL AND JUNCTION BOXES

PART 1 GENERAL

1.01 DESCRIPTION

- A. Pull or junction boxes shall be provided in all raceway systems where required to avoid an excessive number of bends, to facilitate wire pulling, or to afford required access to the raceway system. Maximum distance between boxes in raceway systems shall not exceed 100 feet.
- B. Pull and junction boxes shall provide adequate space and dimensions for the installation of conductors in accordance with NEC Article 314.

1.02 QUALITY ASSURANCE

- A. All equipment shall be UL listed and labeled and in accordance with applicable NEMA and ANSI Standards.

PART 2 PRODUCTS

2.01 PULL AND JUNCTION BOXES

- A. Pull and Junction Boxes: Provide galvanized code-gauge sheet steel junction and pull boxes, with screw-on covers, of types, shapes and sizes, to suit each respective location and installation. Minimum size shall be 4 inch square, 2 1/8 inch deep box.
- B. Concealed pull or junction boxes shall be flush in finished walls, located near the floor and provided with flush type covers; blank device plates in case of outlet type boxes and flat plates prime painted and secured with flat head screws in the case of larger boxes. Surface junction boxes in utility areas shall be without knockouts, shall have close fitting screw covers and shall be finished in medium gray enamel.
- C. Boxes exposed to the weather shall be weatherproof type as required by NEC.
- D. Bushings, Knockout Closures and Locknuts: Provide corrosion-resistant punched-steel box knockout closures, conduit locknuts and malleable iron conduit bushings, offset connectors, of types and sizes to suit respective uses and installation.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install pull and junction boxes, complying with Manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation," and in compliance with recognized industry practices.
- B. Coordinate installation of electrical boxes and fittings with wire/cable and raceway installation work.

- C. Pull and junction boxes shall be located in utility areas or above accessible ceiling systems wherever possible. Boxes located in exposed areas shall be brought to the attention of the Architect prior to installation.
- D. Pull and junction boxes shall be sized in accordance with the NEC for both contained conductors and conduit entrances and exits.
- E. Fasten boxes rigidly to structural surfaces, or solidly imbed electrical boxes in concrete or masonry.
- F. Boxes not otherwise accessible in ceilings and walls shall be made accessible by an access panel.
- G. Provide watertight boxes, slip expansions or bonding jumpers where dictated by construction conditions.

END OF SECTION

SECTION 26 05 53
ELECTRICAL IDENTIFICATION

PART 1 GENERAL

1.01 NAME PLATES

- A. Furnish and install equipment identification nameplates on all pieces of electrical equipment including, but not limited to:
1. Safety Switches
 2. Motor Starters
 3. Panelboards
 4. Switchboards
 5. Substations
 6. Transformers
 7. Lighting Control Panels
 8. Individual Relays
 9. Each Switch, Circuit Breaker, Spare, and Space in new and existing Distribution Panelboards and Switchboards
 10. Emergency Generators
 11. Automatic Transfer Switches
 12. Busways and Plug-In Devices
 13. Uninterruptible Power Supply Equipment (UPS)

Identify and label all existing circuits and equipment that are located within the contract construction area.

- B. Nameplates shall state the equipment name and number or letter as shown on the Drawings; voltage and phase; HP, ampacity or KW size; and source of power. Identification shall be as shown in the following examples:
1. Main Switchboard MSB
480/277 V, 3Ø, 4W
2500 Amps
Fed by Utility Transformer
 2. Exhaust Fan EF1
2 HP, 208 V, 3Ø
Fed by Ckt P1-1
 3. Panel P1
208/120 V, 3Ø, 4W
225 Amps
Fed by TFMR T1 – (Ckt H1-1)
 4. Electric Water Heater EWH-1
4 KW, 208 V, 3Ø
Fed by Ckt P1-7
- C. In manholes, handholes, pull and junction boxes, identify each set of circuit conductors by permanent ink on plastic tags with circuit number, voltage and phase, wire size, source, and load information.
- D. Refer to Section 26 00 80, "Power System Coordination Analysis" for equipment labeling. Arc Flash and Available Fault Current shall be provided for the following equipment:
1. Panelboards

2. Switchboards
 3. Circuit Breaker Enclosures
 4. Substations
 5. Automatic Transfer Switches
 6. Plug-In Devices on Busways
 7. Elevator Controllers
- E. Refer to Section 26 05 10, "Wire and Cable" for color code identification of wire and cable.
- F. Refer to Section 26 24 20, "Panelboards" for branch circuit identification.
- G. Refer to Section 27 10 00, "Structured Cabling System" for identification of communication wiring system cable and equipment.

1.02 SPECIAL INSTRUCTION AND WARNING SIGNS

- A. Furnish and install nameplates giving special instructions (examples as follows):
1. At emergency generator :
 "Emergency generator"
 "208/120 Volt, 3 Phase"
 "Powers ATS and fire pump"
 2. At fire pump controller:
 "Fire pump controller"
 "Utility power from substation on 1st floor"
 "Emergency power from generator "
 3. At main shutoff valve for natural gas service in building:
 "Natural gas shutoff valve for building"
 "Emergency generator also fed by this line"
 4. Where more than one (1) service equipment location exists in a building, a nameplate shall be installed at each location denoting the existence of multiple services, their voltage, and building areas served by each service. Refer to NEC 230.4E(NEC 2026).
- B. Provide a sign mounted on the service entrance equipment indicating the type and location of on-site generator power sources as required in NEC 700.8, 701.8, 702.7 (NEC 2026).
- C. Furnish and install nameplates giving warning as follows:
1. High voltage equipment (over 600 volts) enclosures, vaults, doors, and fences shall be provided with "Danger" warning signs stating voltage.
 2. Non-load break disconnect switches and switches on the load side of variable frequency drives, shall have "Caution" warning sign stating "Do Not Open Under Load."
 3. Emergency generator rooms shall have a "Warning" sign on the door reading "Warning! Excessive Noise When Generator Running. Hearing Protection Required."
 4. Series rated circuit breakers and/or fuses shall be identified as such as follows:
 "CAUTION - SERIES RATED SYSTEM - AMPS AVAILABLE. IDENTIFIED REPLACEMENT COMPONENT REQUIRED."

1.03 JUNCTION BOX IDENTIFICATION

- A. Junction boxes in conduit runs shall be color coded and labeled as to the system that they have within. Each system shall have a different color or labeling scheme used. Do not color code in finished areas without ceilings.

- B. Electrical power and lighting branch circuit junction boxes shall be painted, but labeled with the circuit numbers contained within. Labeling may be done with paint stencils or permanent black felt-tip markers.
- C. Special systems shall have junction boxes painted as follows:
 - 1. Fire Alarm - Red
 - 2. Paging/Sound/Intercom/Nurse Call - Blue
 - 3. Card Access/Security - Yellow
 - 4. Voice/Data/Video - White
 - 5. Normal – Silver
 - 6. Life Safety System – Green
 - 7. Critical Power System – Orange
 - 8. Lighting – Black

PART 2 PRODUCTS

2.01 NAMEPLATES

- A. Nameplates for equipment shall be Safe-T-Mark Style matte non-glare finish with engraving depth no less than 0.003". Provide nameplate suitable for outdoor use for equipment installed outdoors. Letter type shall be minimum 3/8 inch high for equipment name and 1/4 inch high for details. All uppercase letters.
- B. Nameplates for wiring device cover plates shall be laminated adhesive plastic tape minimum of 1/4 inch high and all uppercase letters.
- C. Color of nameplates shall be white with black letters for normal power systems and red with white letters for emergency power systems.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install nameplates on equipment using cadmium plated, steel, self-tapping screws or rivets.
- B. Nameplates shall be installed on the front cover or trim of each piece of equipment. Where not possible, install on wall next to equipment using hollow-wall anchors.
- C. Horsepower, ampacity, or kilowatt values shall be taken from the equipment as delivered in the field, not from the Drawings.
- D. Wiring device cover plate nameplates shall be installed at top of cover plate.

3.02 EXISTING EQUIPMENT IDENTIFICATION

- A. Provide nameplates on all existing equipment within building as listed in Paragraph 1.01.A. of this Specification Section.

- B. Provide updated panelboard directories in all existing panelboards within building as required for new panelboards per Section 26 24 20, "Panelboards," Paragraph 3.01.

END OF SECTION

SECTION 26 05 82
UNDERGROUND JUNCTION BOXES

PART 1 GENERAL

1.01 DESCRIPTION

- A. Furnish and install underground junction boxes where required and/or as shown on the Drawings and specified herein. Boxes shall be provided where required to avoid an excessive number of bends and to facilitate wire pulling. Maximum distance between pull boxes shall not exceed 500 feet. Provide all accessories and equipment as necessary for a complete system.

1.02 QUALITY ASSURANCE

- A. All equipment shall be UL listed and labeled and in accordance with applicable NEMA and ANSI Standards.

1.03 SUBMITTALS

- A. For Review:
 - 1. Product data sheets of all components
- B. To be included in Record and Information Manuals:
 - 1. One (1) copy of each approved submittal

1.04 MANUFACTURERS

- A. Underground pull boxes
 - 1. Quazite Composolite
 - 2. Norwalk
 - 3. Synertech Products Inc.

PART 2 PRODUCTS

2.01 UNDERGROUND JUNCTION BOXES

- A. Underground junction boxes shall be constructed of gray polymer concrete and reinforced by heavy-weave fiberglass. Pull box rating shall be 8,000 lbs. over a 10" x 10" area designed for vehicular traffic.
- B. Junction boxes shall be 17" x 30" x 16" deep with tapered flanged footing, open bottom, stackable construction, with two (2) 4-inch mouse holes. Covers shall be flush mounted, with skid resistant surface, pentahead bolts, and "Electric" or "Communications" logo as appropriate.
- C. Junction boxes shall be Quazite PT 1730 BB.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install junction boxes where required and/or shown on the Drawings. Box covers shall be flush with surrounding soil.
- B. Install junction boxes on a gravel base that extends down to bottom of conduit excavation.

END OF SECTION

SECTION 26 08 40
ELECTRICAL TESTS, ADJUSTMENTS, INSPECTION

PART 1 GENERAL

1.01 DESCRIPTION

- A. Furnish equipment and perform as necessary all testing as required herein and called for in other Division 26 Specification Sections. Perform adjustments of equipment as required. Arrange for inspections by the authority having jurisdiction.

1.02 QUALITY ASSURANCE

- A. Testing equipment shall be UL listed and specially manufactured and appropriate for the intended type of testing to be performed.
- B. All testing shall be witnessed by Owner's Representatives. Provide five days advance notice.

1.03 SUBMITTALS

- A. For Review:
 - 1. Test results form (attached to the end of this Section) with all recorded data sheets and graphs
- B. To be included in Record and Information Manuals:
 - 1. One (1) copy of each approved submittal
 - 2. Final Certificate of Inspection

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 TESTING

- A. Amperage Phase Balance
 - 1. Test and record amperage of each phase at main switchboard, each branch distribution panel, and all lighting and appliance panels.
- B. Continuity of Conduit System
 - 1. Test each run of metallic conduit for continuity of ground return path.
- C. Conductor Insulation Leakage
 - 1. Test each run of 600 volt cable for insulation leakage. Use the short-time method with readings taken at 30 and 60 seconds. Record results for conductors used for switchboard and panelboard feeders.
 - 2. Test each run of 15 kV cable for insulation leakage. Refer to Section 26 05 13, "5-35 kV Cable" for test procedure. Record results of all conductors.
- D. Grounding System Resistance
 - 1. Test and record grounding system resistance. Refer to Section 26 05 26, "Grounding" for test procedure.

- E. Operating Voltage
 - 1. Measure and record operating voltage at main switchgear and all panelboards with all systems in building operating normally.
- F. Dielectric Strength
 - 1. Provide megger test of all transformers to verify dielectric strength.
 - 2. No load/low load loss for medium voltage transformers.

3.02 ADJUSTMENTS

- A. Amperage Phase Balance
 - 1. Where Contractor has deviated from panelboard circuit arrangement as shown on the Drawings, perform a phase balancing within the panelboard by rearranging the position of selected circuit breakers. Record the changed circuits on the "As-Built" Drawings.
- B. Continuity of Conduit System
 - 1. Where the resistance of a conduit run is greater than two (2) ohms, disassemble all connections, clean, and reassemble to obtain an acceptable reading.
- C. Conductor Insulation Leakage and Impedance
 - 1. Where insulation leakage is above Manufacturer's stated values, replace conductor.
- D. Grounding System Resistance
 - 1. Refer to Section 26 05 26, "Grounding" for procedure for grounding system resistance adjustment.
- E. Operating Voltage
 - 1. Adjust taps of all high voltage, service and dry-type transformers when loaded voltage readings drop below nominal system voltages. Final voltage shall be at nominal or above.
- F. Other Adjustments
 - 1. Refer to Division 26 Specification Sections for additional adjustments.

3.03 INSPECTION

- A. Inspection shall be performed by:
 - 1. Local authorized inspection agency, or
 - 2. State division of Inspection
- B. Contractor shall arrange for periodic and final inspections in a timely manner and with due regard for the work of other Contractors and the Construction Schedule.
- C. Include final Certificate of Inspection in the Record and Information Manuals.

END OF SECTION

TEST RESULTS FORM

PROJECT NAME:

CONTRACTOR:

SYSTEM:

SPECIFICATION SECTION NUMBER:

TYPE OF TEST:

EQUIPMENT USED:

WEATHER CONDITIONS:

TEMPERATURE:

HUMIDITY:

PART OF SYSTEM TESTED:

SUMMARY OF TEST:

PERSON PERFORMING TEST: _____ DATE: _____

CONTRACTOR'S REPRESENTATIVE: _____

(Attach Recorded Testing Data Sheets To This Form)

CERTIFICATE OF SYSTEM APPROVAL

PROJECT NAME: _____

CONTRACTOR: _____

SYSTEMS COMPONENT: _____

SPECIFICATION SECTION NUMBER: _____

A. APPROVAL (If required by specification section)

The above listed system has been inspected and approved as meeting the specified instructions for installation.

Owner's Representative: _____ Date: _____

B. EQUIPMENT DEMONSTRATION

The above listed system has been demonstrated to the following Owner's Representatives:

	<u>NAME</u>	<u>TITLE</u>	<u>DATE</u>	<u>SIGNATURE</u>
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

(ATTACH A SEPARATE PAGE FOR ADDITIONAL NAMES)

SECTION 26 28 16
SAFETY SWITCHES

PART 1 GENERAL

1.01 DESCRIPTION

- A. Furnish and install safety switches where shown on the Drawings, and where required including all accessories and mounting hardware.
- B. Refer to Section 26 28 17, "Elevator Safety Switches" for safety switches used for elevator controllers.

1.02 QUALITY ASSURANCE

- A. All equipment shall be UL listed and labeled and in accordance with applicable NEMA and ANSI Standards.
 - 1. Comply with NEMA KS 1.
 - 2. Comply with UL 98.

1.03 SUBMITTALS

- A. For Review:
 - 1. Product data sheets of safety switches
- B. To be included in Record and Information Manuals:
 - 1. One (1) copy of each approved submittal

1.04 MANUFACTURERS

Subject to compliance with requirements, provide products by one of the following:

- A. Safety Switches
 - 1. Square D Company
 - 2. Cutler-Hammer Electric Corporation
 - 3. Siemens Energy & Automation, Inc.
 - 4. GE by ABB
- B. AC manual toggle disconnect switch
 - 1. Leviton
- C. Equipment shall be furnished by the Manufacturer supplying major components of the electrical distribution system.

PART 2 PRODUCTS

2.01 SAFETY SWITCHES - NON-FUSIBLE

- A. Safety switches shall have heavy-duty, single-throw, quick-make, quick-break, visible knife blade operators mounted in hinged cover steel enclosure. Lugs shall be listed for 75 degrees C ampacity aluminum or copper wire.

- B. Switches shall be clearly labeled for "ON" and "OFF" handle positions. Cover shall have defeatable safety interlock with handle to prevent inadvertent opening when in the "ON" position. Handle shall be pad lockable in the "OFF" position with at least three (3) padlocks.
- C. Safety switches to be horsepower rated 600 volt AC.
- D. Switches shall have ground lug kit and neutral when required.
- E. Non fusible switches shall be series-rated with upstream devices in accordance with manufacturer's application date.

2.02 SAFETY SWITCHES - FUSIBLE

- A. Fusible safety switches shall be as specified in Paragraph 2.01 and with the following additional features:
 - 1. Safety switches rated 600 Amperes and less shall have spring reinforced, plated fuse clips with rejection feature for Class R fuses.
 - 2. Safety switches rated larger than 600 Amperes shall have provisions for Class L fuses.
 - 3. Short circuit-interrupting rating shall be 200,000 Amperes RMS symmetrical.
 - 4. Safety switches to be horsepower rated 240 volt AC for 208 or 240 volt usage, and 600 volt AC for 480 volt usage.

2.03 AC MANUAL TOGGLE DISCONNECT SWITCHES

- A. Toggle disconnect switch shall be snap switch with copper mechanism, silver alloy contacts, 10,000 Ampere withstand rating, in a NEMA 1 enclosure. 1, 2, or 3 pole with amperages of 30 to 60 Amperes, as required for load connected.

PART 3 EXECUTION

3.01 APPLICATION

- A. Provide the following NEMA rated enclosure types in these locations:
 - 1. Interior, dry and clean locations: NEMA 250, Type 1.
 - 2. Exterior locations: NEMA 250, Type 3R.
 - 3. Kitchens and washdown areas: NEMA 250, Type 4.
 - 4. Other wet or damp, interior locations: NEMA 250, Type 4.
 - 5. Indoor locations subject to dust, falling dirt, and dripping noncorrosive liquids: NEMA 250, Type 4.
 - 6. Hazardous areas indicated on drawings: NEMA 250, Type 7 or Type 9 as applicable.
- B. Provide AC manual toggle disconnect switch in NEMA 1 enclosure for disconnecting means located at instantaneous electric water heaters.

3.02 INSTALLATION

- A. Use flexible conduit to and from safety switches where vibration isolation is required.

- B. Install safety switches securely to building structure. Install safety switches on freestanding metal framing system support where mounting to building structure is not feasible or where shown on the Drawings. Framing system shall be galvanized steel.
- C. Safety switches located downstream of variable frequency drives shall have auxiliary control power interlock switch on handle. Run wiring to variable frequency drives.
- D. Provide fuses sized in accordance with Equipment Manufacturer's data plate.
- E. Provide nameplates in accordance with Section 26 05 53, "Electrical Identification."
- F. Touch-up all scratches on enclosure after installation.

END OF SECTION

SECTION 26 29 13
MOTOR CONTROLLERS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Furnish and install motor starters and combination motor starter/disconnect switches as shown on the Drawings and as specified herein.

1.02 QUALITY ASSURANCE

- A. All equipment shall be UL listed and labeled and in accordance with applicable NEMA and ANSI Standards.
- B. Motor starters shall be sized in accordance with NEMA Standards.
- C. ANSI/NEMA ICS2- 2000 (R2005)
- D. ANSI/UL 508/2018
- E. ANSI/NEMA ICS 1-2000 (R2008)

1.03 SUBMITTALS

- A. For Review:
 - 1. Product data sheets
 - 2. Wiring diagrams
- B. To be included in Record and Information Manuals:
 - 1. One (1) copy of each approved submittal
- C. Fuses
 - 1. Refer to Section 26 28 13, "Fuses."

1.04 MANUFACTURERS

Subject to compliance with requirements, provide products by one of the following:

- A. Motor Controllers
 - 1. Siemens Energy & Automation, Inc.
 - 2. Cutler-Hammer/Eaton Corporation
 - 3. Square D Company
 - 4. Allen - Bradley Company, Inc.
 - 5. GE by ABB

PART 2 PRODUCTS

2.01 FRACTIONAL HORSEPOWER MANUAL STARTERS

- A. Fractional horsepower manual starters shall be toggle type quick-make/quick-break switch with double break silver alloy contacts, melting alloy type thermal overload relay, red pilot light, in flush or surface mounted with stainless steel coverplate and handle guard/lockoff.

2.02 MAGNETIC MOTOR STARTERS

- A. Magnetic motor starters shall be across-the-line magnetic type with double break silver alloy contacts, molded coil and solid state type overload relay with phase loss protection. Starters shall have four (4) external field convertible auxiliary contacts. Refer to Sequence of Operation in Division 23 for type.
- B. Starters shall be 3 pole, 3 phase with solid state overload relays, 3 position hand-off-auto (H-O-A) switch, reset button, oversized control power transformer (50 watts extra capacity) with primary and secondary fusing, and green pilot light in NEMA rated enclosure.

2.03 COMBINATION MOTOR STARTER/DISCONNECT SWITCHES

- A. Combination motor starter/disconnect switches shall be across-the-line magnetic type with double break silver alloy contacts, molded coil, solid state overload relay with phase loss protection. Starters shall have four (4) external field convertible auxiliary contacts. Refer to Sequence of Operation in Division 23 for type.
- B. Combination motor starter/disconnect switches shall be 3 pole, 3 phase with solid state overload relays, three position hand-off-auto (H-O-A) switch, reset button, oversized control power transformer (100 watts extra capacity) with primary and secondary fusing, and green pilot light in NEMA rated enclosure.
- C. Combination motor starters shall have a visible blade disconnect switch with fuse blocks. The disconnect handle used on combination motor starters shall always be in control of the disconnect device with the door opened or closed. The disconnect handle shall be clearly marked as to whether the disconnect device is "ON" or "OFF," and shall include a two (2) color handle grip, the black side visible in the "OFF" position indicating a safe condition and the red side visible in the "ON" position indicating an unsafe or danger condition.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Motor locations shown on the Drawings are approximate. Obtain exact location of motors from Contractor installing the motor driven equipment. DO NOT ROUGH-IN BY SCALING THE ELECTRICAL DRAWINGS.
- B. Final connections to equipment shall be made using liquid-tight flexible steel conduit.
- C. Install fabricated steel floor stands for mounting starters where loads are in the center of a room. Floor stands shall be metal framing system or 2 inch steel angle with galvanized finish.

- D. Wall-mounted switches and motor starters shall be grouped together and installed on a 3/4 inch fire retardant plywood backboard.
- E. Provide appropriate solid state overload relay sized to match each motor nameplate rating. Overload relay for motors with power factor correction shall be adjusted according to ammeter readings of motor circuit.
- F. Provide fuses in all fuse holders in accordance with Section 26 28 13, "Fuses."
- G. Provide the following NEMA rated enclosure types in these locations:
 - 1. Interior - 1
 - 2. Exterior - 3R
 - 3. Kitchens - 4X
- H. Provide nameplates in accordance with Section 26 05 53, "Electrical Identification."
- I. Provide control wiring as shown and/or described on the Drawings.

END OF SECTION

SECTION 26 60 10
SNOW MELTING SYSTEM

PART 1 GENERAL

1.01 DESCRIPTION

- A. Furnish and install a complete Snow Melting System as shown on the Drawings and herein specified. Provide all equipment as necessary for a complete system.

1.02 QUALITY ASSURANCE

- A. All equipment shall be UL listed and labeled for snow melting applications and in accordance with applicable NEMA and ANSI Standards, and NEC Article 426.

1.03 SUBMITTALS

- A. For Review:
 - 1. Product data sheets of all components
 - 2. Dimensioned Drawings of cable layout
 - 3. Wiring diagrams
- B. To be included in Record and Information Manuals:
 - 1. One (1) copy of each approved submittal
 - 2. Test results
 - 3. Certificate of System Completion

1.04 MANUFACTURERS

- A. Snow Melting Cable
 - 1. Raychem Corporation
- B. Junction Boxes
 - 1. Hoffman
 - 2. Weigmann
 - 3. Raychem

1.05 SYSTEM OPERATION

- A. The control panel shall automatically turn on power to the snow melting cable when the temperature drops below 38 degrees F and moisture is detected by the snow detector.

PART 2 PRODUCTS

2.01 SNOW MELTING CABLE

- A. Cable shall be:
 - 1. Cable shall have two (2) No. 14 AWG tinned copper bus wires embedded in parallel in a self-regulating polymer core covered by a cross-linked dielectric jacket, a tinned copper braid, and a modified polyolefin outer jacket. Cable shall operate on 200-277 volt AC. Raychem Electromelt EM2-XR.

2.02 SNOW SENSOR

- A. Snow sensor shall have a thermostat with 38 degrees F setpoint and a precipitation detector in one (1) aluminum housing with threaded end for conduit mounting. Sensor shall operate on 24 volt AC from the control panel. Raychem CIT-1.

2.03 CONTROL PANEL

- A. Control panel shall have automatic and manual modes of operation, multiple sensor capability, and adjustable (0 - 5 hours) timer and status lights for power and snow melting cable operation. Control panel shall be in a wall mountable enclosure, operate from 120 volt power, and have two (2) internal relays (rated 20 Amperes at 240 volts) for controlling heater loads or contactors. Control panel shall have "MANUAL ON/TIMER/OFF" accessory switch. Raychem APS-3B.

2.04 MISCELLANEOUS

- A. Power connection/end seal kits shall be Raychem EMK-XP.
- B. Expansion joint kits shall be Raychem EMK-XEJ.
- C. Junction boxes shall be weatherproof NEMA 4 with locking hinged cover. Provide 400 cubic inches of capacity per circuit in each junction box. Hoffman A-XCHNF.
- D. Snow melting cables shall be energized by control panel through a Contactor. Refer to Section 26 09 23, "Electrical Control Equipment."
- E. Splice kits shall be Raychem EMK-XS.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Cable shall be installed as shown in the Drawings and in accordance with Manufacturer's written instructions.
- B. Install cable in a serpentine pattern on 12 inch centers with at least 2 inches of concrete, unless indicated otherwise by Manufacturer, plastic wire-tied to concrete reinforcement steel every 24 inches.
- C. Install junction boxes on outside of building near snow melting cables in an inconspicuous location. Install identification plate on junction boxes.
- D. Make all power connections and end splices above grade within junction boxes. Cable runs to be double backed into junction boxes unless noted otherwise on Drawings. Cables to be protected by minimum of 1 inch rigid metal conduit with end bushings per cable from where cable leaves pavement to junction box.
- E. Install expansion joint kits in cable where crossing expansion joints.

- F. Install snow sensor on roof facing upward on a 12 inch conduit riser in a location away from obstructions or building appurtenances that would cause faulty operation.
- G. Install control panel and Contactors where shown on Drawings.
- H. Provide 30 mA type ground-fault circuit-interrupter circuit breakers on each snow melting cable branch circuit.
- I. Provide 120 volt control power to control panel and contactors.
- J. Install a caution sign in each snow melting cable area indicating the presence of snow melting equipment.
- K. Install conduits feeding junction boxes in a manner that condensation within the conduit will not enter a junction box.

3.02 TESTING

- A. Perform an insulation resistance test using a megohmmeter (Megger) set at 2500 volts DC. Cable should read at least 20 megohms.
- B. Perform tests on all cable runs before, during and after concrete pour. Locate any cable breaks and repair using Manufacturer's recommended procedure and splice kits.
- C. Operate system for a minimum of seven (7) consecutive days with no problems before claiming Contract Completion.
- D. Manufacturer's Representatives shall inspect and approve cable layout before concrete pour. Refer to Section 26 00 99, "Requirements of Contract Completion."

3.03 EQUIPMENT DEMONSTRATION

- A. After all system tests have been completed, schedule an instruction period with the Owner. Instruction to be provided by Manufacturer's authorized field technician.
- B. Instruction shall include:
 - 1. Location of all components of the system and explanation of their function
 - 2. Demonstration of equipment
 - 3. Maintenance and repair procedures
 - 4. Programming procedures
 - 5. Review of documents in Record and Information Manuals
- C. Contractor shall have all participants sign the Certificate of System Completion in Section 26 00 99, "Requirements for Contract Completion."

END OF SECTION

SECTION 27 00 15
SUBMITTALS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Refer to the GENERAL CONDITIONS and Division 1 for general requirements.
- B. Materials and equipment installed in this work shall meet all the requirements of the Contract Documents and no materials or equipment shall be ordered until submittals are reviewed and approved by the Architect and Engineer.
- C. Submit complete catalog data or shop drawings for each manufactured item of equipment and all components to be used in the work, including specific performance data, material description, rating, capacity, working pressure, dimensional data, material gauge or thickness, wiring diagrams, brand name, catalog number, and general type.
- D. Catalog data for equipment reviewed by the Engineer shall not take precedence over the requirements of the Contract Documents. The review of the Engineer shall not relieve the Contractor from the responsibility for deviations from Drawings or Specifications, nor from the responsibility for providing proper clearance and coordination with other Trades.
- E. When submitted for review, all shop drawings shall bear the Contractor's signed certification that he/she has reviewed, checked, and approved the shop drawings, that they have been coordinated with the requirements of the project and with the provisions of the Contract Documents, and that he/she has verified all field measurements and construction criteria, materials, catalog numbers, and similar data. Annotations shall be in red ink.
- F. Each required Specification Section submittal shall be complete with all required information included in one PDF file. External web links are not permitted. Include a transmittal cover page indicating Specification Section name and number.
- G. Submittals shall be sent to shopdrawings@korda.com.

1.02 CONTRACTOR'S RESPONSIBILITIES

- A. Complete review of shop drawings, product data, and samples prior to submission.
- B. Determine and verify:
 - 1. Field Measurements
 - 2. Field Construction Criteria
 - 3. Catalog Numbers and Similar Data
 - 4. Conformance with Specifications
- C. Coordinate each submittal with requirements of the work and the Contract Documents.
- D. Include a letter in the front of the submittal of any deviations in the submittals from the requirements of the Contract Documents.
- E. Make submittals and resubmittals, if necessary, promptly in accordance with the approved schedule and in such sequence as to cause no delay in the work or in the work of any other Contractor, or the project as a whole.

- F. Make any corrections or changes in rejected submittals as required by the Architect and resubmit until approved.
- G. Begin no fabrication or work which requires submittals until approved submittals are returned.

1.03 INCORPORATION OF SUBMITTALS INTO RECORD AND INFORMATION MANUALS

- A. Refer to Section 27 00 20, "Record and Information Manuals."

1.04 CERTIFICATIONS

- A. Provide:
 - 1. Test Agency results verifying capacities, operating conditions and power requirements at design conditions
 - 2. Manufacturer's Statement of Compliance with Standards discussed in individual Specification Sections
 - 3. Equipment labels indicating Certification requirements
 - 4. Quality standard designations on each unit piece
 - 5. Typed verification that noted mixes, chemical compositions, and testing procedures were complied with
 - 6. Other Certifications listed in other Sections of the Specifications

1.05 REQUIRED SUBMITTAL INFORMATION

- A. Submittal Transmittal
 - 1. Provide the following information on the Transmittal Form for each submittal:
 - a. Project name and address.
 - b. Specification number, as listed for each submittal item required in Paragraph 1.05C below.
 - c. Item description, as listed for each submittal item required in Paragraph 1.05C below. Where equipment is identified by number or tag on the documents, same shall be indicated on the submittal.
 - d. Specification number and item description (b and c, above) for each submittal if more than one submittal is sent under one transmittal form.
 - e. Name, address and telephone number of Contractor.
 - f. Bid package number (if applicable).
 - 2. Submittal Transmittal Forms not properly identified with the above information will be returned (without review) to the Contractor.
- B. Refer to the following letter key:

KEY FOR REQUIRED SUBMITTALS:

- A. Shop Drawings and/or Layout Drawings
- B. Product Data Sheets
- C. Wiring Diagrams
- D. Installation, Operation, and Maintenance Instructions (Due at the end of project)
- E. Reports or Test results (Due at the end of project)

- C. Submit information on equipment items as listed below.

SECTION #	CONTRACT ITEM	SUBMITTALS REQUIRED
27 00 20	RECORD AND INFORMATION MANUALS	A, B, C, D
27 10 00	STRUCTURED CABLING SYSTEM	A, B, E

- D. After approval, one (1) copy shall be returned to the Contractor. Contractor shall make prints of the approved transparencies and reproductions of all other shop drawing information as necessary for his/her use and for inclusion in the Record and Information Manuals.

END OF SECTION

SECTION 27 00 20
RECORD AND INFORMATION MANUALS

PART 1 GENERAL

1.01 RECORD DRAWINGS

- A. Refer to Division 1 for general requirements as well as for specific information regarding Record (As-Built) Drawings. All drawings shall be provided in electronic PDF format.

1.02 OPERATION AND MAINTENANCE MANUALS

- A. Refer to Division 1 for general requirements and for specific information regarding Operation and Maintenance Manuals, including required format(s) (paper and/or electronic) and quantity. If no such requirements are listed in Division 1, provide in electronic format. Submit one (1) copy of draft manual to the Architect for review and approval thirty (30) days before final inspection is due. After approval, submit three (3) approved manuals to the Owner and obtain receipt. (See Section 26 00 99, "Requirements for Contract Completion.")
- B. Paper Copy Manuals shall be loose leaf, three-ring, heavy-duty hard-cover binders. Material shall be typewritten or printed and be fully legible. Each section shall be divided by labeled tabs.
- C. Electronic Copy Manuals shall be PDF file format. Individual documents shall have filenames corresponding to specification sections and system names. Each document shall have bookmarks corresponding to the systems, subsystems, and equipment names. Use electronic files prepared by manufacturers where available.
- D. The following items, together with any other necessary pertinent data, shall be included in each Manual:
1. Each manual shall be labeled on front cover with project name, Contract, Contractor's name, Architect, Engineer, and date of project completion.
 2. Manufacturers' names, nearest Factory Representative, and model and serial numbers of components of systems
 3. Operating instructions, start-up and shutdown procedures
 4. Maintenance instructions
 5. Routine and 24 hour emergency service/repair information:
 - a. Name, address, and telephone number of servicing agency
 - b. Names of personnel to be contacted for service arrangements
 6. Parts list with numbers of replaceable items, including sources of supply
 7. Manufacturers' literature describing each piece of equipment
 8. One (1) approved copy of each submittal
 9. Written warranties
 10. Certificate of Material Receipt and Certificate of System Completion
 11. Record (As-Built) Drawings
 12. IP and MAC address identified for each item required to have an address
 13. Certificate of Final Inspection signed by Building Authority Having Jurisdiction
 14. Test results
 15. Video recordings of all equipment demonstrations and training sessions

END OF SECTION

SECTION 27 00 70
DEMOLITION

PART 1 GENERAL

1.01 DESCRIPTION

- A. Perform demolition work of all telecommunications items as shown and/or described on the Drawings. Remove all items from site designated as scrap.
- B. Provide care so as not to damage adjacent construction designated to remain.
- C. All telecommunications items in good condition are to remain the property of the Owner. Verify with the Owner's Representative which items are considered scrap and are to be disposed of.

PART 2 PRODUCTS - (NOT APPLICABLE)

PART 3 EXECUTION

3.01 DEMOLITION

- A. Coordinate and schedule all work in a careful manner with all necessary consideration for the Owner, neighbors, and the public, avoiding interference with the use of, and passage to and from adjacent areas and facilities designated to remain in use during demolition. Coordinate work with other trades.
- B. Disconnect and remove all items as shown and described on the Drawings completely back to source, including:
 - 1. Telecommunications, audio/visual, and security devices, boxes and plates
 - 2. Low-voltage cabling
- C. Maintain all existing cabling to items that are to remain in use.
- D. For existing outlets which are to be removed and have conduits rising from the floor slab, re-cable as required to provide service to remaining outlets. Division 26 Contractor shall remove outlets and conduit and shall patch floor as required.
- E. For all other existing devices to be removed mid-span (e.g., consolidation points, speakers, CATV, etc.), re-cable as required to maintain service to the remaining devices.
- F. Abandoned outlet boxes in walls to remain shall be closed with blank coverplates. If equipped with devices, the devices and cabling shall be removed as required.
- G. Disconnect and remove telecommunications connections to equipment designated to be removed by other Trades.

- H. Abandoned low voltage cables, if not being labeled for future use, shall be removed. Coordinate with building Owner regarding tagging for future use. Any cable that shall remain for future use shall be tagged at the cut end with the label "For Future Use", including the label of the telecommunications room and source panel. Label the source panel location to identify the abandoned cable.

3.02 RELOCATION

- A. Items designated to be relocated shall be removed and stored until the construction is ready for their installation.

3.03 SALVAGE AND SCRAP

- A. Tag and identify all salvageable materials. Coordinate with Owner's Representative all items to be salvaged and store on site as directed. Removal of salvaged and stored items from site is to be by the Owner.
- B. Division 27 Contractor shall remove all scrap items from the building and arrange for disposal in accordance with State and Local regulations.
- C. Disposal of hazardous materials shall be in accordance with Federal and State Environmental Protection Agency regulations. A signed statement signifying proper disposal shall be furnished to the Building Owner in the Record and Information Manuals.

3.04 EXISTING EQUIPMENT TO REMAIN

- A. All existing outlets, equipment, and associated cabling and conduit systems which interfere with the work of the General Trades, Structural, or Division 21, 22, 23, and 26 Contractors shall be reworked as required to maintain system operation. Arrange for relocation of conduits where they interfere with new work of other Trades.

END OF SECTION

SECTION 27 10 00
STRUCTURED CABLING

PART 1 GENERAL

1.01 DESCRIPTION

- A. This document describes the product and execution requirements related to furnishing and installing the Structured Cabling System as shown on the Drawings and specified herein.

1.02 SCOPE OF WORK

- A. The Structured Cabling Contractor (SCC) shall provide an extension to the existing Structured Cabling System (SCS) as defined in this section.
- B. The SCC shall provide, test, and certify all Category cabling, not only as listed herein, but also as required in all Division 27 and/or Division 28 specifications included with this project.
- C. As described elsewhere in these Documents the system consists of fiber optic and copper cabling, and related hardware. In addition to the basic cable plant requirements, the testing and identification requirements are also defined.
- D. The installation shall be of an "Open System," using standard media and layout, standard connections and interfaces. The Contractor shall adhere to this Specification, local and national codes and provide quality workmanship.
- E. This section includes:
 - 1. Backbone cabling
 - 2. Horizontal cabling
- F. The components used on this project for voice, data, and CATV shall be as identified in Part 2 of this Section.
- G. Unless noted otherwise on the Drawings, for all 4 pair Category cable, this project shall use T568B termination for eight (8) position jack pair assignments as specified per the ANSI/TIA 568-C wiring standard. For fiber, follow ANSI/TIA 568-C.3, Optical Fiber Cabling Components Standard, and its published addenda.
- H. All continuous pathways (i.e., conduit, cable tray, raceway, etc.) required to support the cabling shall be provided by the Electrical Contractor under Division 26 unless indicated otherwise in the Contract Documents.
 - 1. All non-continuous or non-rigid pathways (i.e., J-hooks, inner-duct, etc.) required to support the cabling shall be provided by the SCC under the Structured Cabling System, unless indicated otherwise in the Contract Documents.
 - 2. All ladder rack, cable tray, and related pathway hardware built into Telecommunications Spaces shall be provided by the SCC.
- I. The SCC shall be responsible for providing the racks and enclosures as required and specified herein.

- J. The SCC shall test and label the entire installation as specified and required by the codes and standards.
- K. The SCC shall be responsible for providing the hangers and support system specified herein and shown on the Drawings.
- L. Final sizing and location of J-hooks, hangers, and supports shall be the responsibility of the Contractor. However, NO increases to the bid price and/or the schedule extension shall be allowed due to equipment alterations.
- M. For new installations, J-hooks fill capacity shall not exceed 70% of its rated cable fill capacity (i.e., if J-bracket is rated for 100 cables, no more than 70 shall be installed).
- N. J-hooks are intended for voice, data, video, audio, and security cables only. They are intended for cable routing in areas of less than 100 Category 6 cables. All other low voltage cabling systems, such as building controls, shall have cabling run-ins separate raceway system.
- O. All hangers and support material shall be galvanized or stainless-steel, rust-free material.
- P. The Telecommunications Contractor shall ensure that the General Contractor and Painting Contractor acknowledge that the painting or over spray of any single or group of 4 pair horizontal telecommunications Category cable is not allowed. Any painted or over sprayed cable(s) shall be completely removed and replaced at the Painting Contractor's expense. No in-line connectors, splices, taps or other repairs will be permitted. Painted cable will not be covered as part of an extended warranty. Painted cable obscures the print legend and can alter the cable's mechanical properties and fire rating. Painted cable compromises its integrity and/or performance. It may act as an accelerant or create an additional smoke hazard in the event of a fire and as such this is considered a life safety issue. Paint contamination and/or removing paint from the cable with a solvent can affect the cable's durability and its electrical characteristics.

1.03 QUALIFICATIONS

- A. The SCC must meet the following requirements to be approved for this project. He/she shall meet the following qualifications and provide the information, as listed, in the submittal package:
 - 1. Must be a member of Building Industry Consulting Service International (BICSI) or Engineer approved, other Telecommunications Organization, and shall have at least five (5) years' experience installing Telecommunications Cabling and Equipment.
 - 2. Supply a list of a minimum of five (5) projects over \$100,000 that the firm has completed along with contact names and phone numbers of the Owners' Representatives for those projects. At least three (3) of the completed facilities shall have been occupied and in full operation for at least one (1) year.
 - 3. The SCC shall be a certified installer for the connectivity and cabling solution specified for this project and maintain that status with the warranting manufacturer, including all training requirements, for the duration of the cable infrastructure project.

4. The SCC shall have, as a direct employee, a minimum of one (1) RCDD on staff. The RCDD must be a full-time employee of the company and must be listed with the company on the BICSI Credential Holder website. This individual shall review all submittals, RFIs, change order proposals, as-built documents, and shall provide system engineering support and oversight of all field work to ensure system installation is fully compliant with all requirements of current versions of ANSI/TIA-568 (cabling), ANSI/TIA-569 (pathways and spaces), ANSI/TIA-606 (labeling), and ANSI/TIA-607 (bonding and grounding), including all addenda and all associated TSBs.
 5. The SCC's RCDD shall stamp all test results included in the Record and Information Manual and the final (field marked) As-Built Drawings, as being correct and accurate, that are included in the Record and Information Manual.
 6. It is the intent of this contract for the Contractor to provide sole responsibility for material, labor, and service for the communication cabling system. The Contractor shall, at a minimum, staff the project with BICSI certified installers for project foremen and crew leader positions.
 7. The SCC must own or have a current lease agreement for equipment to test up to Category 6a and fiber optic cable. He/she shall supply proof as required above in the submittal package, including latest calibration date.
- B. At the time of bid form submission, the SCC shall submit the following information:
1. The SCC's manufacturer certifications for:
 - a. Twisted pair cabling
 - b. Fiber optic cabling
 - c. Connectivity
 2. The RCDD's BICSI certification. Refer to SCC's Qualifications below.
 3. A listing of the like projects within the last three (3) years. Refer to SCC's Qualifications below.
- C. During the bid review, the SCC may be asked to provide any/or all of the following:
1. A listing of the probable team members
 2. BICSI and manufacturer certifications for the installation of the Structured Cable Plant.
 3. Certifications for the installation for any firestopping required under the scope of the Structured Cable Plant installation.
- D. Any/all items listed in paragraph 1.03 subparagraph B.1 or B.2, can and will be checked for authenticity and accuracy. The Owner reserves the right to reject any unauthorized or inaccurate submissions.
- E. Should the SCC either fail or refuse to provide any of the items listed and/or requested in paragraph 1.03 subparagraph B.1 or B.2, the Owner reserves the right to determine the SCC as being not fully responsive and as such discard the bid in its entirety.

1.04 SUBMITTALS

- A. Product Data Sheets
1. All products
 2. Copies of all certifications

- B. Shop Drawings
 - 1. The SCC shall submit the following shop drawings:
 - a. A detailed riser diagram demonstrating the SCC's understanding of the backbone cabling.
 - b. Drawings of any floor boxes with details of the various internal faceplates and their respective contents.
 - c. Drawings of any through floor fittings with details of their contents.
 - d. Layout drawings for cable tray and cable runway (1/16" scale minimum) based on trade coordination efforts indicating anticipated routings based on the coordination among the various trades.

PART 2 PRODUCTS

2.01 BACKBONE CABLING

- A. The SCC shall provide all backbone cabling system as shown on the Drawings and as required to make a complete installation (both copper and fiber).
- B. Outside Plant, Fiber Optical Cable shall be indoor/outdoor or outside plant "tight buffer" type cable. All fiber not installed in conduit must be armored or installed in inner duct.
 - 1. Strand count shall be as shown on the Drawings.
 - 2. Cable shall be minimum OM4 50/125-micron multimode cable unless otherwise shown on the Drawings.
 - 3. Fiber must be protected from moisture with a moisture resistant jacket and a filling of water blocking material.
 - 4. Approved cable manufacturers:
 - a. BerkTek
 - b. CommScope
 - c. Corning
 - d. Mohawk
 - e. Panduit
 - f. Superior Essex
 - g. TCS

2.02 HORIZONTAL CABLING

- A. Copper Station Cabling from the media converter to the device shall be:
 - 1. Category 6, UTP, 4 pair, OSP rated approved manufacturers
 - a. BerkTek LANmark 6 OSP UTP
 - b. Mohawk LAN-Trak 6 OSP M57622
 - c. Panduit PUO6C04
 - d. Superior Essex CMR/CMX Cat 6

PART 3 EXECUTION

3.01 DOCUMENTS

- A. Prepare and supply documents required. See "TESTING" below.

3.02 BACKBONE CABLING INSTALLATION

- A. The SCC shall provide labor, supervision, and materials as required for a complete installation of the backbone cabling system which includes, but is not limited to, the cabling to and from the MTR and to the TR, pulling, supporting, terminating, labeling and testing.
- B. Vertical cable runs shall be supported by split cable grip every 20 vertical feet.

3.03 HORIZONTAL CABLING INSTALLATION

- A. The SCC shall provide labor, supervision, and materials as required for a complete installation of the horizontal cabling system that includes, but is not limited to, cabling from the TR to the work area, pulling, supporting, terminating, labeling, and testing.
- B. Cables shall be installed in continuous lengths from origin to destination (no splices) except for transition points, or consolidation points.
- C. Exceptions to ANSI/TIA 568-C distance limitations for horizontal Category 6 cables include the following. Extending Ethernet and PoE Ethernet cabling distances beyond the 100-meter limit is permitted using Ethernet extenders for devices such as CCTV cameras, wireless access points, and IP blue light telephones. The cable must be tested to the extender manufacturer's specifications. Only use this exception when noted on the drawings or made necessary because of construction issues. Other solutions for extending Distance Cabling beyond 100 meters:
 - 1. Where allowed per local standards and codes, an extended distance balanced twisted-pair cable with 22 AWG conductors and that can be certified on a level 3 cable certifier for the applicable bandwidth and power to be supported.
 - 2. Single pair Ethernet as allowed for the application (ANSI/TIA-568.5 and ANSI/TIA-568.0-E-1) and acceptable by owner and jurisdiction.
 - 3. The use of an optical fiber connection with separate copper conductors to transmit power. Optical fiber media converter can also be used to transition onto balanced-twisted pair cabling near the end device.
 - 4. Use of a wireless link to act as a bridge between wireless access point or antenna.

3.04 WORK

- A. The SCC shall furnish all materials, labor, and supervision required to install and put into service the structured cabling system specified and shown on the Drawings.
- B. The SCC shall be aware that they must coordinate their work with other trades and lack of access to the job site does not relieve them of the responsibility to complete the work as scheduled.
- C. The SCC shall furnish sufficient manpower and resources to finish the project when scheduled for completion. If required, the SCC will work their crew overtime to meet the completion schedule with no additional compensation.
- D. All work shall be done in a professional manner; equipment installed vertical and horizontal; cables pulled neat and aligned, but allowing slack; cables bundled, but no tie wraps shall be used; use hook and loop straps loosely, do not tighten cable bundle.

- E. All conduits pull boxes, junction boxes, AP enclosures, cables, jacks, modules and other devices shall be labeled.

3.05 CABLE ROUTING

- A. The SCC shall avoid electromagnetic interference (EMI) by routing all structured cabling a minimum of:
 - 1. 4 feet from 480-volt motors and transformers
 - 2. 12 inches from electrical power distribution cables
 - 3. 6 inches from fluorescent lighting
- B. Horizontal cable shall not exceed 90 meters.
- C. Conduits shall have no more than an equivalent of two (2) 90-degree bends allowed in any single run between junction boxes.
- D. Cables in open or non-continuous pathways shall be routed such that the following bending radius limitations are not exceeded:
 - 1. 4-pair UTP – minimum 4 times the overall cable diameter
 - 2. 4-pair STP – minimum 8 times the overall cable diameter
 - 3. Fiber Optic Cabling – minimum 20 times the overall cable diameter
 - 4. Other Structured Cabling – refer to latest ANSI/TIA 568 Standard
- E. Whenever possible, cables shall be routed from technology room into corridor and follow the corridor before branching out to the work area outlet location.

3.06 TESTING

- A. The SCC shall provide a copy of the unaltered certification test reports to the Engineer in both hardcopy and electronic format. The Contractor shall also provide a copy of the associated Cable Tester's Database Management Software with unedited soft copy.
- B. Upon completion of the balanced twisted-pair cable installation, the SCC shall perform copper cable certification tests on the complete channel for every cable, included but not limited to:
 - 1. Wire map
 - 2. Length
 - 3. Insertion loss
 - 4. Near End Cross Talk (NEXT)
 - 5. Attenuation to Crosstalk Ratio – Far End (ACR-F)
 - 6. Propagation Delay and Delay Skew
 - 7. Return Loss
 - 8. Power Sum Near End Cross Talk (PSNEXT)
 - 9. Power Sum Attenuation to Crosstalk Ratio – Far End (PSACR-F)
 - 10. Insertion Loss
- C. Test shall be performed to published standards, including but not limited to, the latest revisions of ANSI/TIA 568-C, ISO/IEC 11802 and other applicable standards at the time of installation.

- D. All UTP/ScTP field testers shall be factory calibrated each calendar year by the field test equipment manufacturer as stipulated by the manuals provided with the field test unit. The calibration certificate shall be provided to the Engineer for review prior to the start of testing.
- E. All Category 6 permanent links are qualified for linear transmission performance up to 250 MHz and all Category 6a permanent links are qualified for linear transmission performance up to 500 MHz to ensure that high frequency voltage phase and magnitude contributions do not prove cumulative or adversely affect channel performance.
- F. Upon completion of the coaxial cable installation, the SCC shall perform cable certification tests on every cable including, but not limited to:
 - 1. Direct current loop resistance
 - 2. Impedance
 - 3. Length
 - 4. TDR
 - 5. Noise
- G. Upon completion of the fiber optic cable installation, the SCC shall perform optical time domain reflectometer (OTDR) testing and optical loss testing with a light source power meter on every cable.
- H. In addition to any specific tests mentioned here, the SCC shall perform all required testing and documentation to obtain a fully certified installation from the manufacturer including, if applicable, extended length cable.
- I. As may be required for extended applications warranties by the manufacturer, the manufacturer shall provide site inspection services of the installation in completed and/or in progress. The SCC shall make all necessary arrangements for such site visits.
- J. Upon completion of all installation, termination and testing, the SCC shall review the entire installation with the Engineer and, at the discretion of the Owner, the Owner's authorized representative. **Before this review, the Contractor shall present the hard copies of all unadulterated test results.** The Engineer and Owner will review these test results, assess the installation, and return a written letter of acceptance to the Contractor for the Structured Cabling System.

3.07 WARRANTY

- A. The SCC shall provide a minimum twenty (20) year extended Product and Applications Warranty on parts and labor from the Connectivity Manufacturers (certified Contractor Program).

END OF SECTION

SECTION 28 00 00
DIVISION 28 - ELECTRONIC SAFETY AND SECURITY INTRODUCTORY STATEMENT

PART 1 GENERAL

1.01 REQUIREMENTS

- A. All work included under this heading is subject to the Bidding Requirements, the Instructions to Bidders, the General Conditions, and/or the Division 1 General Requirements written for this entire Specification and shall apply to all work herein.
- B. In addition to conforming to the documents listed in Paragraph 1.01 A. above, the work performed by the Division 28 Contractor shall conform to all provisions of Sections 28 00 00 through 28 99 99 as included and made part of this Specification. The Division 28 Contractor is to consider the word "Contractor" when used in these Sections to mean himself/herself.
- C. The Division 28 Contractor must read the Specifications of all divisions, because they will be responsible for any and all work described in other Sections where reference is made to Division 28 and/or Electronic Safety and Security Contractor.

1.02 APPLICABLE SECTIONS

- A. Division 28 Contractor shall perform work described in the preceding paragraphs, and as it relates to Division 28 work in the following Sections (as included):

26 05 27	Telecommunications Bonding Infrastructure
27 00 00	Communications Introductory Statement
27 10 00	Structured Cabling
- B. Where reference is made to the Division 27 Contractor in the above applicable Division 27 Specification Sections, it shall be construed to mean Division 28 Contractor.

1.03 RESPONSIBILITY

- A. The Engineer's efforts under this Contract are aimed at designing a project that will be safe during construction and after full completion of the project. The Engineer has no expertise in, and takes no responsibility for, construction means and methods or job site safety during construction, which are exclusively the Contractor's responsibility. Processing and/or approving submittals made by the Contractor which may contain information related to construction methods or safety issues, or participation in meetings where such issues might be discussed must not be construed as voluntary assumption by the Engineer of any responsibility for safety procedures.
- B. If a conflict occurs between the Drawings and/or the Specifications, immediately call the conflict to the attention of the Architect at least ten (10) days before bids are submitted, so an addendum clarification may be issued. Conflicts not brought to the Architect's attention before bids are due, shall be priced by the Contractor to include the most expensive, highest quality and quantity of the conflicting items in question.

END OF SECTION

SECTION 28 00 15
SUBMITTALS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Refer to the GENERAL CONDITIONS and Division 1 for general requirements.
- B. Materials and equipment installed in this work shall meet all the requirements of the Contract Documents and no materials or equipment shall be ordered until submittals are reviewed and approved by the Architect and Engineer.
- C. Submit complete catalog data or shop drawings for each manufactured item of equipment and all components to be used in the work, including specific performance data, material description, rating, capacity, working pressure, dimensional data, material gauge or thickness, wiring diagrams, brand name, catalog number, and general type.
- D. Catalog data for equipment reviewed by the Engineer shall not take precedence over the requirements of the Contract Documents. The review of the Engineer shall not relieve the Contractor from the responsibility for deviations from Drawings or Specifications, nor from the responsibility for providing proper clearance and coordination with other Trades.
- E. When submitted for review, all shop drawings shall bear the Contractor's signed certification that he/she has reviewed, checked, and approved the shop drawings, that they have been coordinated with the requirements of the project and with the provisions of the Contract Documents, and that he/she has verified all field measurements and construction criteria, materials, catalog numbers, and similar data. Annotations shall be in red ink.
- F. Each required Specification Section submittal shall be complete with all required information included in one PDF file. External web links are not permitted. Include a transmittal cover page indicating Specification Section name and number.
- G. Submittals shall be sent to shopdrawings@korda.com.

1.02 CONTRACTOR'S RESPONSIBILITIES

- A. Complete review of shop drawings, product data, and samples prior to submission.
- B. Determine and verify:
 - 1. Field Measurements
 - 2. Field Construction Criteria
 - 3. Catalog Numbers and Similar Data
 - 4. Conformance with Specifications
- C. Coordinate each submittal with requirements of the work and the Contract Documents.
- D. Include a letter in the front of the submittal of any deviations in the submittals from the requirements of the Contract Documents.
- E. Make submittals and resubmittals, if necessary, promptly in accordance with the approved schedule and in such sequence as to cause no delay in the work or in the work of any other Contractor, or the project as a whole.

- F. Make any corrections or changes in rejected submittals as required by the Architect and resubmit until approved.
- G. Begin no fabrication or work which requires submittals until approved submittals are returned.

1.03 INCORPORATION OF SUBMITTALS INTO RECORD AND INFORMATION MANUALS

- A. Refer to Section 28 00 20, "Record and Information Manuals."

1.04 CERTIFICATIONS

- A. Provide:
 - 1. Test Agency results verifying capacities, operating conditions and power requirements at design conditions
 - 2. Manufacturer's Statement of Compliance with Standards discussed in individual Specification Sections
 - 3. Equipment labels indicating Certification requirements
 - 4. Quality standard designations on each unit piece
 - 5. Typed verification that noted mixes, chemical compositions, and testing procedures were complied with
 - 6. Other Certifications listed in other Sections of the Specifications

1.05 REQUIRED SUBMITTAL INFORMATION

- A. Submittal Transmittal
 - 1. Provide the following information on the Transmittal Form for each submittal:
 - a. Project name and address.
 - b. Specification number, as listed for each submittal item required in Paragraph 1.05C below.
 - c. Item description, as listed for each submittal item required in Paragraph 1.05C below. Where equipment is identified by number or tag on the documents, same shall be indicated on the submittal.
 - d. Specification number and item description (b and c, above) for each submittal if more than one submittal is sent under one transmittal form.
 - e. Name, address and telephone number of Contractor.
 - f. Bid package number (if applicable).
 - 2. Submittal Transmittal Forms not properly identified with the above information will be returned (without review) to the Contractor.

- B. Refer to the following letter key:

KEY FOR REQUIRED SUBMITTALS:

- A. Shop Drawings and/or Layout Drawings
- B. Product Data Sheets
- C. Wiring Diagrams
- D. Installation, Operation, and Maintenance Instructions (Due at the end of project)
- E. Reports or Test results (Due at the end of project)

- C. Submit information on equipment items as listed below.

SECTION #	CONTRACT ITEM	SUBMITTALS REQUIRED
28 00 20	RECORD AND INFORMATION MANUALS	A, B, C, D
28 13 00	SECURITY AND ACCESS CONTROL SYSTEM	A, B, C, D
28 15 23	AUDIO/VIDEO INTERCOM SYSTEM	A, B, C, D, E
28 23 00	VIDEO SURVEILLANCE SYSTEM	B, C, D

- D. After approval, one (1) copy shall be returned to the Contractor. Contractor shall make prints of the approved transparencies and reproductions of all other shop drawing information as necessary for his/her use and for inclusion in the Record and Information Manuals.

END OF SECTION

SECTION 28 00 20
RECORD AND INFORMATION MANUALS

PART 1 GENERAL

1.01 RECORD DRAWINGS

- A. Refer to Division 1 for general requirements as well as for specific information regarding Record (As-Built) Drawings. All drawings shall be provided in electronic PDF format.

1.02 OPERATION AND MAINTENANCE MANUALS

- A. Refer to Division 1 for general requirements and for specific information regarding Operation and Maintenance Manuals, including required format(s) (paper and/or electronic) and quantity. If no such requirements are listed in Division 1, provide in electronic format. Submit one (1) copy of draft manual to the Architect for review and approval thirty (30) days before final inspection is due. After approval, submit three (3) approved manuals to the Owner and obtain receipt. (See Section 26 00 99, "Requirements for Contract Completion.")
- B. Paper Copy Manuals shall be loose leaf, three-ring, heavy-duty hard-cover binders. Material shall be typewritten or printed and be fully legible. Each section shall be divided by labeled tabs.
- C. Electronic Copy Manuals shall be PDF file format. Individual documents shall have filenames corresponding to specification sections and system names. Each document shall have bookmarks corresponding to the systems, subsystems, and equipment names. Use electronic files prepared by manufacturers where available.
- D. The following items, together with any other necessary pertinent data, shall be included in each Manual:
 - 1. Each manual shall be labeled on front cover with project name, Contract, Contractor's name, Architect, Engineer, and date of project completion.
 - 2. Manufacturers' names, nearest Factory Representative, and model and serial numbers of components of systems
 - 3. Operating instructions, start-up and shutdown procedures
 - 4. Maintenance instructions
 - 5. Routine and 24 hour emergency service/repair information:
 - a. Name, address, and telephone number of servicing agency
 - b. Names of personnel to be contacted for service arrangements
 - 6. Parts list with numbers of replaceable items, including sources of supply
 - 7. Manufacturers' literature describing each piece of equipment
 - 8. One (1) approved copy of each submittal
 - 9. Written warranties
 - 10. Certificate of Material Receipt and Certificate of System Completion
 - 11. Record (As-Built) Drawings
 - 12. IP and MAC address identified for each item required to have an address
 - 13. Certificate of Final Inspection signed by Building Authority Having Jurisdiction
 - 14. Test results
 - 15. Video recordings of all equipment demonstrations and training sessions

END OF SECTION

SECTION 28 13 00
SECURITY AND ACCESS CONTROL SYSTEM

PART 1 GENERAL

1.01 DESCRIPTION

- A. Division 28 Contractor shall furnish and install a complete Security and Access Control System as shown on the Drawings and as specified herein. Provide all accessories and equipment as necessary for a complete system.
- B. System shall be complete with control panels, door contacts, motion detectors, keypads, power supplies, batteries, phone line dialer, audible devices, supervised wiring, and all other items required for a complete fully functioning system. The connection to the intrusion devices shall be fully supervised and support normally open, normally closed, supervised and non-supervised circuits.
- C. The system shall connect to all reader and alarming devices to support the following:
 - 1. The system shall support Standard Cards, Biometric technologies as well as Government cards with the following specifications:
 - a. Proximity (125 KHz),
 - b. MIFARE®, MIFARE DESFire®, MIFARE DESFire® EV1 (13.56 MHz),
 - c. Biometric Identification & Authentication (1:1 and 1:N multi-factor),
 - d. HID® iCLASS®,
 - e. NFC,
 - f. Magnetic Swipe,
 - g. Barcode (1D linear, 2D datamatrix, US & International formats),
 - h. PIV, PIV-II, TWIC, CAC (Transition, Endpoint) HSPD-12 FIPS 201 Compliant
- D. The security system shall provide monitor and control interface to the CCTV System (28 23 00). The input interface shall monitor selected video motion alarm contact closures from the CCTV System, causing an alarm when un-authorized motion is detected by the CCTV System. The output interface shall provide contact closures to the CCTV System to start video recording at full speed for selected cameras when an alarm occurs.
- E. The Security System shall be designed and installed to not interfere with egress requirements for life safety nor interfere with intrusion or fire alarm systems.

1.02 QUALITY ASSURANCE

- A. The system shall be UL listed and approved for the application intended and shall be compliant with all standards and regulations that may apply. These listing and approvals shall include, but not be limited to, FCC, CE, UL 1950, UL 294, and UL 1076. The latter UL 1076 will be applied only to the overall system, including the host when available.
- B. Contractor shall be certified with the equipment manufacturer that is being installed.

1.03 SUBMITTALS

- A. For Review:
 - 1. Product data sheets of all components
 - 2. Wiring Diagrams

3. Full Size Layout Drawings

B. To be included in Record and Information Manuals:

1. One (1) copy of each approved submittal
2. Test results
3. Certificate of System Completion
4. Certificate of Material Receipt

1.04 MANUFACTURERS

A. Security and Access Control System

1. Lenel/S2

B. Card Reader

1. Lenel/S2 BlueDiamond

C. Power Supplies

1. Altronix
2. LifeSafety Power
3. ASSA ABLOY

PART 2 PRODUCTS

2.01 CONTROL UNIT

- A. Control unit shall contain all necessary components to provide complete control, testing and indicating facilities for the entire security alarm and access control system. The unit shall have battery back-up providing four hours of continuous operation during power outages.
1. The unit shall have processing capabilities to remain completely operational in an offline mode should the communications link become non-functional,
 2. The unit shall have as a part of their standard package the ability to communicate with servers and other local controllers via an Ethernet based TCP/IP protocol.
 3. The unit shall have the capability to interface standard OSDP and Wiegand devices, as well as provide I/O to various serial protocols, including but not limited to RS-485, RS-422, and RS-232. OSDP should be used over Wiegand for new installs when possible.
 4. The unit shall have as a part of their standard package the ability to communicate with servers and other local controllers via an Ethernet based TCP/IP protocol,
 5. The unit shall have peripheral I/O panels that provide additional digital I/O both logic level and form-C contacts.
- B. The Contractor shall provide sufficient cabinets, card, and related hardware to control all doors, door contacts and other related devices indicated on the drawings, plus spare capacity of 25% per Telecommunications Room (TR). This spare capacity shall be distributed throughout the system control panels on a TR by TR basis; i.e. each TR shall contain the available spare capacity as defined above.
- C. To ensure continued, one-call support, the system shall be constructed of sensing components provided directly by the system manufacturer, such as power supplies, motion detectors, door and window position switches, glass break detectors, or other sensing devices that the manufacturer offers.

- D. The Contractor shall include all power supplies, batteries and other peripheral devices required to provide a fully functional system as described herein, and indicated on the Drawings.
- E. The system shall support user interaction by way of a keypad, web browser, system software, key switch, or radio frequency wireless control, using integrated or auxiliary devices provided by the system manufacturer.

2.02 CREDENTIAL READERS AND CREDENTIALS

- A. The credential reader shall be a read only Multi-technology contactless smart card reader and be designed to securely read, interpret, and authenticate access control data from 13.56 MHz contactless smart card credentials and 125 kHz proximity cards.
 - 1. Customized security protection through support of the device-independent Secure Identity Object™ (SIO) portable credential methodology to provide enhanced security and performance features.
 - 2. Backwards compatibility with legacy 13.56 MHz contactless smart card and 125 kHz proximity access control formats (E.g. 26-bit, 32, 35-bit, 37-bit, 56-bit, and HID Corporate 1000 formats). Compatibility across the product line shall be assured without the need of special programming.
 - 3. The multi-technology contactless smart card reader shall be configurable to provide multiple hierarchical degrees of key compatibility for accessing the smart card access control data.
 - 4. The multi-technology contactless smart card reader shall provide simultaneous support for 125 kHz proximity FSK (HID Proximity, AWID). PSK (Indala), and ASK (EM4102) 125 kHz technology to increase credential technology migration options.
- B. The Credential shall be a 13.56MHz based card.
 - 1. The card shall be 2.125" x 3.370" x 0.030" ±0.003" nominal.
 - 2. The card shall be constructed of polyvinyl chloride (PVC) laminate.
 - 3. The card shall have an operating temperature of -50° to 160° F. and weigh 6.8g.
 - 4. The card shall be RF programmable at 13.56MHz with customer specified ID numbers.
 - 5. The card shall use passive technology allowing an infinite number of reads.
 - 6. The card shall be capable of accepting either direct image or thermal printing.
 - 7. The card shall be laser engraved with an external identification number.
- C. Provide battery backup with batteries and battery charger as required to provide one-hour operation of the security system in the event of a power failure.
- D. Card Readers shall fit in a standard 1-gang mudring, be black in color, and have bi-color LED indicator. Provide 100 smart cards with the system. Programming of cards shall be included and coordinated with Owner.

2.03 ACCESS CONTROL SOFTWARE FUNCTIONS

- A. General
 - 1. Utilize the existing access control system.

2.04 DUAL HEAD GOOSENECK PEDESTAL

- A. The pedestal shall be 42" in height with two face plates and a heavy-duty base plate. The pedestal shall also be rated for all weather conditions.
 - 1. Basis of design: Pedestal PRO 42" Dual Head Gooseneck Pedestal. Model # 42-TT or engineer approved equivalent.

PART 3 EXECUTIONS

3.01 INSTALLATION

- A. Division 28 Contractor shall install Security System as shown on the Drawings in accordance with Manufacturer's written instructions.
- B. All wiring shall be installed in conduit.
- C. All delayed egress equipped doors will be monitored by the Security System for device power supply status, fire alarm relay status, device arm/disarm status, device alarm status, and door position.

3.02 TESTING

- A. Division 28 Contractor shall provide a complete functional test of all components in accordance with Manufacturer's recommendations.
- B. Operate system for a minimum of seven (7) consecutive days with no problems before claiming Contract Completion.
- C. Refer to Section 26 08 40, "Electrical Tests, Adjustments, Inspection."

3.03 SPARE PARTS

- A. Division 28 Contractor shall furnish one (1) spare device for each type used, including keypad, passive infrared detector, and door contacts.
- B. Obtain a signed copy of the Certificate of Material Receipt from Section 26 00 99, "Requirements for Contract Completion."
- C. Coordinate the I/O interface, programming and wiring with CCTV System supplier (28 23 00) for control and monitor of the CCTV System.

3.04 EQUIPMENT DEMONSTRATION

- A. After all system tests have been completed, schedule an instruction period with the Owner. Instruction to be provided by Manufacturer's authorized field technician. Provide four separate sessions of four hours. Record sessions on DVD and furnish two copies to Owner.
- B. Instruction shall include:
 - 1. Location of all components of the system and explanation of their function
 - 2. Demonstration of equipment
 - 3. Maintenance and repair procedures

4. Programming procedures
 5. Review of documents in Record and Information Manuals
- C. Division 28 Contractor shall have all participants sign the Certificate of System Completion in Section 26 00 99, "Requirements for Contract Completion."

3.05 WARRANTY OF WORK

- A. The Division 28 Contractor shall warrant all materials, equipment, and workmanship for a period of one (1) year from date of completion. Refer to Section 28 00 00.

END OF SECTION

SECTION 28 15 23
AUDIO/VIDEO INTERCOM SYSTEM

PART 1 GENERAL

1.01 REQUIREMENTS

- A. The Contractor shall comply with Section 28 00 00, "Division 28 - Communications Introductory Statement" of Division 28 Specifications.
- B. This Specification describes the product and execution requirements related to furnishing and installing the audio/video intercom system as shown on the Drawings and specified herein.

1.02 SCOPE OF WORK

- A. It is the intent of this Specification to spell out the minimum acceptable requirements for the audio/video intercom system to be provided for this project.
- B. Division 28 Contractor shall provide and install a complete audio/video intercom system, providing all hardware, software, brackets, and equipment as shown on the Drawings or required for a complete functional system.
- C. IP Network Compatible Video Intercom System: A network-based communication and security system featuring video entry security, internal communication, emergency stations, and paging. All units and app in the systems shall be able to unlock doors remotely on a network, assist onsite visitors from an offsite location, broadcast emergency announcements, and communicate using a PoE network.
- D. The "outside" unit shall flush mounted where wall space is available or surface mounted on 1 3/4 inch mullion if possible.
- E. The inside station shall be hands free with video and pushbutton for activating the door strike or magnetic door lock.
- F. The system shall have a processing unit for programming a variety of Owner desired door functions.
- G. The IP Network Compatible Video Intercom System shall be a network-based communication and security system featuring video entry security and internal communication. All units and app in the systems shall be able to unlock doors remotely on a network, assist onsite visitors from an offsite location, and communicate using a PoE network.

1.03 MOUNTING HEIGHT/LOCATION

- A. The Contractor shall mount the door station on pedestals shown on drawings.
- B. The master units shall be suitable for location on a desk surface.
- C. The processing unit shall be either 19 inches data rack mountable or wall mountable. If wall mountable, it shall not protrude more than 4 inches from wall.

PART 2 PRODUCTS

2.01 MASTER STATION

- A. The master station is an IP addressable video master station with a 7" color LCD touchscreen monitor and handset. It can be wall or desk mounted (desk stand included). The system offers handset (duplex) and hands-free (VOX/PTT) communication and call up to 500 other IX stations. It connects directly to a network using CAT-6 cable. This station requires an 802.3af compliant power-over-Ethernet network.
- B. Basis for design: Aiphone Direct Video Master Station IX-MV7-HB.
- C. Equivalent manufacturers for entire system: Avigilon or Paxton.

2.02 DOOR STATION

- A. IP addressable Audio/Video Door Station, flush mount, stainless steel panel, and back box.
 - 1. Basis for design: Aiphone IX-DVF
- B. IP addressable Audio/Video Door Station, surface mount, aluminum die cast cover.
 - 1. Basis for design: Aiphone IX-DV
- C. IP addressable Audio/Video Door Station, flush mount, stainless steel panel, with HID multiclass Proximity Card Reader, and back box.
 - 1. Basis for design: Aiphone IX-DVF-P
- D. IP addressable Audio-only Door Station, flush mount, stainless steel panel, and back box.
 - 1. Basis for design: Aiphone IX-SS-2G
- E. Doors / gates shall be unlocked for entry from master station. Provide selective door / gate release.

2.03 INPUT/OUTPUT NETWORK ADAPTER

- A. Provide for any door that will allow remote door release. Assume every door with a door station will allow remote door release unless noted otherwise.
- B. Four (4) contact inputs and ten (10) relay outputs.
- C. Basis for design: Aiphone IXW-MA Multipurpose Relay Adaptor
- D. No substitutions

2.04 GATEWAY ADAPTER

- A. Provide one per system for any system that will ring to mobile devices.
- B. One gateway adaptor allowed per system. Allows system to call cloud-based mobile apps, giving users the ability to answer calls from visitors remotely and release the door. Compatible with iOS and Android mobile devices.
- C. PoE compliant.

- D. Simultaneous Call Paths: 8.
- E. Supports up to 9,999 IXG apps.
- F. Power Source: PoE.
- G. Consumption: Standby 2.1 W, Max 2.9 W.
- H. LAN: Ethernet (10 BASE-T, 100 BASE-TX).
- I. Packet Delivery: Unicast, Multicast.
- J. Protocol: IPv4/v6, TCP, UDP, SIP, HTTPS, RTP, RTCP, SRTP, SRTCP, IGMP, MLD, SFTP, DHCP, NTP, DNS, MQTT, ICE, DTLS, SDP.
- K. Dimensions (HxWxD): 4-1/4 x 8-1/4 x 2-3/8 inch.
- L. Basis for design: Aiphone IXGW-GW
- M. No substitutions

2.05 CABLING

- A. No cabling shall be run in open visible areas. Cable shall be either in conduit or wire basket cable tray. Use of "J" hooks routed above lay-in ceiling to basket tray is acceptable.
- B. Conduits from door position switch, electric door lock and Aiphone IX station location at door shall be 3/4 inch. Install in mullion or door frame as needed to conceal and coordinate with Owner's field representative.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install the audio/video intercom system in the locations shown on the Drawings and as specified herein. The system shall be installed per the manufacturer's specifications and wiring diagrams and the manufacturer's written instructions.
- B. All wiring shall be in accordance with this specification and Section 28 00 00, "Division 28-Electronic Safety and Security Introductory Statement Introductory Statement."
- C. Wire system to door electronic latch for unlocking door.
- D. Wire system to allow remote gate release.

3.02 TESTING

- A. Provide a complete functional test of all components in accordance with manufacturer's recommendations.

- B. Operate system for a minimum of seven (7) consecutive days with no problems before final acceptance by Owner.

3.03 EQUIPMENT DEMONSTRATION

- A. After all system tests have been completed, schedule an instruction period with the Owner. Instruction to be provided by manufacturer's authorized field technician.
- B. Instruction shall include:
 - 1. Location of all components of the system and explanation of their function.
 - 2. Demonstration of equipment with extensive training on programming.
 - 3. Maintenance and repair procedures.
 - 4. Review of documents in Record and Information Manuals.

3.04 EXTENDED WARRANTY

- A. Provide a two (2) year extended warranty against defects in materials and workmanship.

END OF SECTION

SECTION 28 23 00
VIDEO SURVEILLANCE SYSTEM

PART 1 GENERAL

1.01 DESCRIPTION

- A. Furnish and install an extension to the existing IP Video Surveillance System as shown on the Drawings and as specified herein. Provide all accessories and equipment as necessary for a complete system.
- B. The Surveillance System shall utilize IP-based cameras to monitor the internal and external areas of the facility. The activity shall be recorded onto a network video recorder (NVR) that will be connected to the Owner's network. Viewing and/or control shall occur by means of a software client loaded onto assigned PCs. Viewing only shall be capable by means of a web-based interface, and/or by means of smartphones and tablets utilizing both Apple iOS and/or Android operating systems.

1.02 QUALITY ASSURANCE

- A. All equipment shall be UL listed and labeled and in accordance with applicable NEMA and ANSI Standards.
- B. Contractor shall be certified with the equipment manufacturer that is being installed.

1.03 SUBMITTALS

- A. For Review:
 - 1. Product data sheets of all components
 - 2. Wiring Diagrams
 - 3. Schematic Block diagrams
 - 4. Network bandwidth calculation
 - 5. Digital video storage calculation
 - 6. Copies of all certifications
- B. To be included in Record and Information Manuals:
 - 1. One (1) copy of each approved submittal
 - 2. Test results
 - 3. Certificate of System Completion

1.04 MANUFACTURERS

- A. As listed within. Basis of design listed is intended to meet the minimum requirements. Other acceptable manufacturers are as noted.

PART 2 PRODUCTS

2.01 IP CAMERA SYSTEM

- A. The system shall be a complete IP based video surveillance system that shall utilize the Owner's network as the method of transport to a video surveillance server that shall record and retain the video and provide an export capability to transfer files that the Owner wishes to record to their choice of media.
- B. Cameras
1. All Cameras shall utilize Internet Protocol as the transport for video signaling.
 2. Housing color for all exterior pole-mounted cameras (including any attached mount and box) shall be painted to match the lighting pole color, while not voiding any manufacturer's warranty.
 3. The cameras shall meet or exceed the following performance requirements and criteria.

4. 4-Way Multi-Sensor (2MP Each) Indoor/Outdoor Camera:

Brand	Axis
Model	P3735 - PLE
Image Sensor	1/2.8" Progressive Scan RGB CMOS
Lens	3.2 ~ 8.1mm
Horizontal FoV	108° ~ 40°
Vertical FoV	55° ~ 23°
Resolution	1920 x 1080
Day & Night	Auto IR cut filter
PoE	IEEE802.3at
Vandal	IK09
Environmental	IP 66/67

Provide enclosures and appropriate mounting bracket for each camera provided based on the location and environment of the installation location. Refer to drawings for camera mounting details and schedule. All exterior wall mount cameras shall be installed with an exterior wall mount kit such that the camera is horizontally mounted (not vertically mounted on the wall). For exterior ceiling mount camera locations where installed on a gable or sloped ceiling, ensure that camera view will be level to the ground by either (a) rotating the camera lens or (b) providing an appropriate pitched mount bracket to compensate for the slope.

- C. Video Management Software (VMS)
1. Utilize existing Milestone VMS.
- D. Network Video Recorder Hardware (NVR)
1. Utilize existing NVR.
- E. NEMA IP66 Outdoor Enclosure
1. NEMA 4, IP66 Rated power supply/battery outdoor enclosure.
 - a. Fiberglass reinforced polyester corrosion resistant enclosure
 - b. Wall or pole mountable
 - c. Lockable door
 2. Enclosure shall be sized to accommodate all equipment.
 3. Reference technology drawing details for equipment storage requirements.

4. Acceptable Manufacturers: Altronix, Polycase, Transtector, Hubbell, Hoffman or Engineer-approved equivalent.
- F. Media Converter and Power Injector
1. Media Converter with Integral Power, for the head end, provides four (4) 1Gb SFP ports and four (4) ports for up to 120W per port (480W total) to be transmitted over single/multi-mode fiber or composite cable (powered) cable (fiber + copper combined)
 - a. The unit shall have 4-Port Gigabit SFP ports.
 - b. The unit shall have integral surge protection and shall have failover upon battery loss.
 2. Media converter/injector for the camera provides a four port 802.3bt (4PPoE) up to 90W and accommodates all current IEEE standards for Gigabit Ethernet over fiber or twisted pair copper to transmit data. Can be installed with single or multi-mode fiber and/or composite cable
 - a. Media converter shall be housed in a NEMA4/4X IP66 Outdoor enclosure.
 3. Acceptable Manufacturers: Altronix Netway, Omnitron, Perle, Transition or Engineer-approved equivalent.
- G. Composite cable, Fiber plus copper
1. Hybrid Copper-Fiber Cables allow DC power and fiber in one cable to deliver low-voltage power and data over long distances to remote locations where standard power is unavailable.
 - a. Indoor/outdoor capability.
 - b. OM3 multimode or OS2 single-mode
 2. Acceptable Manufacturers: Belden, BerkTek, CommScope, AFL, Panduit or Engineer-approved equivalent.

PART 3 EXECUTION

3.01 APPLICATION

- A. Provide IP cameras with lenses appropriate for the areas to be covered.

3.02 COORDINATION WITH OTHER TRADES

- A. Coordinate with Electrical Contractor exact requirements for all pole mounting locations. All holes required in poles shall be factory-drilled prior to galvanizing and/or painting of the poles. Field drilling or modification of poles is not permitted. Mounts shall be attached directly to the pole using the pre-drilled holes, without the use of stainless steel bands/clamps.

3.03 INSTALLATION

- A. Install Video Surveillance System as shown on the Drawings in accordance with manufacturer's written instructions.
- B. Provide 120 volt power to all equipment from nearest emergency circuit.
- C. Provide grounding of all equipment in accordance with ANSI/EIA/TIA-607.

- D. Coordinate Camera height with Owner before securing.
- E. Install all components in cabinets and racks.
- F. Coordinate complete system installation with Owner's representative.
- G. Install Ethernet Switches and validate connectivity throughout. Configure all VLANs, IP Routing, and IP Subnets.
- H. Install and configure UPS systems.
- I. Provide all required Integration Services to set up and program the Network (IP addresses, VLAN's, Routing, Wireless Surveys, etc.).
- J. Contractor shall supply the "latest" software updates as part of the system configuration for two (2) years after system acceptance.

3.04 TESTING

- A. Provide a complete functional test of all components in accordance with manufacturer's recommendations.
- B. Operate system for a minimum of seven (7) consecutive days with no problems before claiming contract completion.
- C. Refer to Section 26 08 40, "Electrical Tests, Adjustments, Inspection."

3.05 EQUIPMENT DEMONSTRATION

- A. After all system tests have been completed, schedule an instruction period with the Owner. Instruction to be provided by manufacturer's authorized field technician. Include four (4) sessions of four (4) hours each on different days.
- B. Instructions shall include:
 - 1. Location of all components of the system and explanation of their function
 - 2. Demonstration of equipment
 - 3. Maintenance and repair procedures
 - 4. Programming procedures
 - 5. Review of documents in Record and Information Manuals
- C. Contractor shall have all participants sign the Certificate of System Completion in Section 26 00 99, "Requirements for Contract Completion."

3.06 WARRANTY OF WORK

- A. Contractor shall warrant all materials, equipment, and workmanship for a period of one (1) year from date of completion.

END OF SECTION

SECTION 31 00 00
EARTHWORK

PART 1 GENERAL

1.01 DESCRIPTION

- A. This Section includes the following:
 - 1. Excavate subsoil and stockpile for later reuse.
 - 2. Grade and contour site to elevations indicated on Drawings.
 - 3. Remove from site excess topsoil and subsoil.
 - 4. Preparing subgrade and filling under slabs on grade, foundations, sidewalks, and paving.
 - 5. Excavation.
 - 6. Fill materials and compaction.
 - 7. Subgrade stabilization for pavement subgrade.
 - 8. Excavating and backfilling trenches and structures.
 - 9. Bedding materials.
 - 10. Fill for over-excavation.
 - 11. Finish grade subsoil.
 - 12. Place, level, and compact topsoil.

1.02 RELATED SECTIONS

- A. Work under this section is subject to the requirements of the Contract Documents including General Conditions, Supplementary Conditions, Drawings, and sections under Division 01 General Requirements.
- B. Section 31 25 00 - Erosion and Sedimentation Control
- C. Section 32 13 00 - Rigid Pavement
- D. Section 31 23 33 - Piped Utilities - Basic Methods
- E. Section 33 11 00 - Water Utilities

1.03 REFERENCED STANDARDS

- A. American Society of Testing and Materials (ASTM).
 - 1. C 136 — Method for Sieve Analysis for Fine and Coarse Aggregates.
 - 2. D 422 — Particle Size Analysis of Soils.
 - 3. D 698 — Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb. (2.49 kg) Rammer and 12-inch (304.8 mm) Drop.
 - 4. D 1556 — Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 5. D 1557 — Test Methods for Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 120 lb. (4.54 kg) Rammer and 18-inch (457 mm) Drop.
 - 6. D 2487 — Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - 7. D 2488 — Description and Identification of Soils (Visual — Manual Procedure).
 - 8. D 2922 — Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).

9. D 3017 — Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
 10. D 4318 — Liquid Limit, Plastic Limit and Plastic Index of Soils.
- B. Occupation Safety and Health Administration (OSHA), 29 Code of Federal Regulations (CFC) Part 1926.650 to .657, Subpart P Construction Standard for Excavations.
- C. **City of Columbus; Construction and Materials Specifications (CMSC).**
1. **The Terms “Engineer,” “Director,” “City,” and other similar terms shall be interpreted as the Owner.**
 2. **In the event of any conflicts between ODOT CMS (CMSC) and the Contract Documents, the most stringent shall apply**
 3. **Local municipality having jurisdiction.**

1.04 SUBMITTALS

- A. Comply with requirements of Division 1 for submittals. Submit two copies of the following items:
1. Material qualification tests for each fill material used and field density test reports directly from Testing Agency.
 2. Testing Agency certificate of inspection and compliance with specifications for the following:
 - a. Bearing capacity for all footing/foundation subgrades.
 - b. Acceptability for both on-site and borrow fill materials, prior to use.
 - c. Acceptability of subgrade prior to fill and pavement base placement.
 - d. Acceptability of fill placement.
 3. Shoring or underpinning plans, signed and sealed by a structural engineer licensed in Ohio.
 4. Submit 1-foot square samples of geotechnical fabric and filter fabric.
- B. Submit to the testing agency in accordance with Division 1 of the project specifications, one week prior to fill placement in order to perform qualification tests.
1. 10 lb. sample of each type of fill to the Testing Agency in airtight containers.

1.05 QUALITY ASSURANCE

- A. Unless otherwise specified, **the Contractor** shall pay for a Testing Agency to perform the following required qualification tests. The Contractor shall coordinate all activities with the Testing Agency and provide the Testing Agency with an accurate schedule and provide notice of field operations.
1. Qualification tests on each different fill material (both on-site and imported).
 2. Fill Materials: Provide the following information and qualifications tests for each fill material, including select on-site materials, prior to use on project site.
 - a. Location of sources for each required imported materials prior to delivery to site.
 - b. Analysis of fine and coarse aggregate ASTM C 136.
 - c. Particle size analysis of soils ASTM D 422.
 - d. Liquid Limit, Plastic Limit and Plasticity Index, ASTM D 4318 — cohesive materials only.
 - e. Proctor density or relative density information according to test method identified in the Compaction Requirements Schedule at the end of this section.

- B. Fill material shall not be used until qualification tests have been completed and the Testing Agency has approved the fill material.

1.06 DEFINITIONS

- A. Stripping: Removal of existing surficial unsuitable materials (see definition) to their entire depth or as indicated.
- B. Excavation: Cutting, digging, removing, and wasting materials of every description, including soils, foundations, rock, and whatever substance encountered to dimensions, limits, elevations, and contours as indicated or required by either the Drawings or these Specifications.
- C. Rock: Boulders and detached stones having a volume of 2/3 cubic yard or more and any large masses of igneous, metamorphic, or sedimentary rocks, including firmly conglomerated deposits that cannot be removed with a 1 cubic yard capacity power shovel without drilling or blasting.
- D. Unsuitable Materials: Topsoil, loam, gumbo, mud, muck, silt, expansive clay, peat, soils with an organic content greater than 3% by weight, rubbish, debris, foundation and slab materials, paving materials, soil meeting ASTM D 2481 soil classification group ML, MH, CH, OL, OH and PT, rock greater than four (4) inches in diameter, soils with a maximum dry weight of less than 100 pounds per cubic foot, vegetation and frozen or dry lumps. Expansive clay is any clay with a liquid limit in excess of 50 and/or Plasticity Index of 30 or greater.
- E. Unstable Materials: Materials which are not classified as unsuitable materials, but due to their condition of being wet, dry, or frozen, are unacceptable for use in fills.
- F. Imported Fill Material or Borrow: Approved soil materials from sources other than those made available by required excavation of Project. Imported fill shall be free of unsuitable and unstable materials and shall be approved by the Testing Agency and have a proctor test to be utilized prior to placement.
- G. Filling/Backfilling: Placing of approved soil materials in accordance with specified procedures and materials and in conformity with lines, grades, contours, cross-sections and elevations shown on Drawings or required by these Specifications.
- H. Subgrade: Undisturbed soil or compacted fill material upon which additional fill, sub-base or base course, footing, foundation, or slab cushion is placed.
- I. Engineered Fill: An acceptable soil, aggregate, or man-made material that is placed in a controlled manner to satisfy a defined compaction Specification. The defined compaction Specification would include a maximum lift thickness, acceptable moisture content, and minimum required compaction percentage based on a moisture/density relationship (proctor or relative density).
- J. Hydrated Lime: A dry powder obtained by treating quicklime with water enough to satisfy its chemical affinity for water under the conditions of its hydration. It consists essentially of calcium hydroxide or a mixture of calcium hydroxide and magnesium oxide or magnesium hydroxide, or both.

- K. Quicklime: A calcined limestone, the major part of which is calcium oxide or calcium oxide in association with magnesium oxide, capable of slaking with water.
- L. Stabilized Subgrade: Pavement subgrade soil stabilized in accordance with the Testing Agency recommendations and as generally described in Section 3.04.E.
- M. Unauthorized Excavation: consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Owner/Engineer. Unauthorized excavation, as well as remedial work directed by Owner/Engineer shall be at Contractor's expense.
 - 1. Under footings, foundation bases or retaining walls, backfill unauthorized excavation with lean concrete or extend indicated bottom elevation of footing or base to excavation bottom without altering required top elevation.
 - 2. In locations other than those above, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by the Engineer or Testing Agency.
- N. Additional excavation: When excavation has reached required subgrade elevations, notify Testing Agency, who will make an evaluation of the conditions. If the Testing Agency determines that bearing materials at required subgrade elevations are unsuitable or unstable, continue excavation until suitable bearing materials are encountered and backfill the excavated area as directed by the Testing Agency based on these specifications. The contract sum may be adjusted by an appropriate contract modification.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle all materials to prevent their deterioration from weather.
- B. Provide sediment and erosion control around all stockpiles in accordance with Section 31 25 00
- C. Sequence work and stockpiles to minimize contamination or mixing of materials.

1.08 PROJECT RECORD DOCUMENTS

- A. Accurately record location of existing utilities, their disposition (abandon or active), rerouted utilities, new utilities by horizontal dimensions, elevations or inverts, and slope gradients.
- B. Verify finished grade spot elevations at locations shown on the grading plans.

1.09 LAYOUT

- A. Employ a Professional Surveyor, registered in State of Ohio, to lay out and establish all lines and grades, including centerline of all structural columns.
- B. Erect control points prior to excavation. Protect existing control points.
- C. All surveying costs to be paid by the Contractor performing the work.

PART 2 PRODUCTS

2.01 FILL MATERIALS

- A. Type A –**CMSC** Item 411 - Stabilized Crushed Aggregate.
- B. Type B – Pea Gravel: Natural stone; washed, free of clay, shale, organic matter; graded in accordance with ANSI/ASTM C136, to the following:
 - 1. Minimum Size: 1/4 inch.
 - 2. Maximum Size: 5/8 inch.
- C. Type C – Sand: Natural river or bank sand, washed: free of silt, clay, loam, friable or soluble materials, or organic matter graded in accordance with ANSI/ASTM C136, within the following limits.

<u>Sieve Size</u>	<u>Percent Passing</u>
No. 4	100
No. 14	10 to 100
No. 50	5 to 90
No. 100	4 to 30
No. 200	0

- D. Type D - Subsoil–Reused, select onsite or borrow soil materials conforming to the following:
 - 1. ASTM D2487 Soil Classification Groups GW, GC, GM, SW, SC, SM, CL, and ML.
 - 2. Less than 3% organic material by weight.
 - 3. Free of unstable or unsuitable material or construction debris.
 - 4. Conform with **CMSC** item 203.02.R
- E. Type E –**CMSC** Item 703, size no. 57 aggregate.
- F. Type F –**CMSC** Item 653.02 Topsoil: Fertile, friable, fine sandy clay loam, uniform in composition, capable of sustaining vigorous plant growth and free of subsoil, stones, lumps, clods of hard earth, plants, plant roots, sticks, noxious weeds, slag, cinders, demolition debris or other extraneous matter over 1 inch in the largest dimension.
- G. Type G - Concrete: Structural concrete conforming to Section 03 30 00, "Cast-in-Place Concrete" with a compressive strength of 4500 psi.
- H. Type H - Drainage Fill: **CMSC** Item 703, Size No. 8 aggregate.
- I. Type I – Low Strength Mortar Backfill: **CMSC** Item 613
- J. Type J - Aggregate Base: **CMSC** Item 304.
- K. Type K – Bank Run Gravel: The material shall consist of bank run sand and gravel, free of frozen materials, wood, rubbish, and unsuitable or unstable material. It shall have no more than 20% passing the No. 200 sieve and no particle size larger than 3 inches. Sources of borrow shall be designated well in advance of construction and the material shall be approved by the Testing Agency prior to beginning work.

2.02 CONSTRUCTION FENCE

- A. Plastic construction fence, orange in color, with the following properties:
 - 1. Material - Co-polymer
 - 2. Typical Aperture Size - 1.3 inches x 1.3 inches
 - 3. Minimum Tensile Strength:
 - a. MD 850 lbs./ft. width
 - b. TD 1050 lbs./ft. width
 - c. MD 4850 psi
 - d. TD 5810 psi
 - 4. Junction Strength - 90% of rib strength (minimum) Nominal Porosity – 75%
 - 5. Ultraviolet Resistance - Fully stabilized
 - 6. Temperature Range - -22 degrees F to 150 degrees F
 - 7. Manufacturer - Tensar Safety Grid or approved equal

PART 3 EXECUTION

3.01 GENERAL

- A. The following Specification shall be considered as general criteria for earthwork operations. In those instances where field conditions arise which are not adequately covered by these criteria, instructions for that specific condition will be issued by the Architect/Engineer.
- B. Dust Control:
 - 1. Use all means necessary to control dust on and near the work and on and near all off-site borrow areas if such dust is caused by the Contractor's operations during performance of the work or if resulting from the condition in which the Contractor leaves the site.
 - 2. Thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors, and concurrent performance of other work on the site.
- C. Grading operations shall be performed in such a manner as to direct and control storm water runoff so that no damage or erosion occurs. Saturation of cut and fill areas shall be prevented by directing storm water runoff and not allowing ponding to occur. Fills are to be crowned as required to maintain drainage at the end of each work day. Existing drainage routes shall not be choked or obstructed until new ones are available. Temporary culverts, pumps or other equipment shall be used to facilitate drainage of fills during construction, failure to drain storm water shall not be grounds for delay of this contract due to saturated site conditions. The Contractor shall remove and dispose of saturated materials in excess of allowable moisture content at compaction and shall maintain the project schedule at all times.
- D. Dewatering: All excavation, construction, and backfill of pipes or other facilities to be constructed under this Contract shall be constructed under dry conditions. The Contractor shall constantly maintain all excavations in a dewatered, workable condition, and shall be responsible for installing, operating, maintaining and removing such dewatering systems as are required.
- E. Site Grading:
 - 1. Existing Conditions: Visit site and verify earthwork requirements prior to commencing work.

- a. Existing Grades: Existing grades and contours are indicated on Drawings and represent the best information available on actual existing site conditions. Verify existing grades prior to commencing work. Commencement of work is construed as acceptance of grades and/or contours as correct.
 - b. Subsurface Conditions: Results of explorations are for use in estimating work quantities and design parameters, and for the information of the Bidders only, and neither the Owner nor the Associate/Engineer will be responsible for variations in subsoil deposition and quality or for changes which may have occurred after the investigations were made.
 - c. See logs of explorations for indication of existing soil and rock boundaries.
2. Required contours and elevations are indicated and noted on the Drawings. Should indicated figures conflict with actual conditions and contours, notify the Engineer and await their direction before proceeding.

3.02 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Identify known below grade utilities. Stake and flag locations.
- C. Identify and flag above grade utilities.
- D. Maintain and protect existing utilities remaining which pass through work area.
- E. Notify utility company to remove and relocate utilities.
- F. Upon discovery of unknown utility or concealed conditions, discontinue affected work; notify Engineer.

3.03 ROUGH GRADING AND EMBANKMENT CONSTRUCTION

A. Rough Grading:

1. Site clearing and grubbing shall be done prior to any rough grading. All debris and deleterious material shall be removed from areas to be filled or backfilled in accordance with this specification.
2. Dispose of excess excavated material or supply additional suitable material as necessary to complete the rough grading to the required elevations.
3. The finished subgrade surface shall be reasonably smooth and free from irregular surface changes and shall be no more than 0.05 feet above or below the approved subgrade elevation.
4. Newly graded areas shall be protected from the action of the elements. Any damage that may occur as a result of natural causes or any construction activities, prior to the acceptance of the work, shall be repaired and grades re-established to the required elevations and slopes.
5. During the performance of rough grading operations, the subgrade shall be proof-rolled under the direction of the testing agency. The proof-roll shall be performed by heavy equipment (minimum 30-ton dual axle dump truck). Any areas discovered which are soft and unstable or exhibit other conditions (pumping or rutting), shall be stabilized immediately as directed by the Testing Agency using one of the following options:
 - a. Scarifying, aerating and recompact.
 - b. Over-excavating and replacing with acceptable fill material.
 - c. Using lime or lime/fly ash modification techniques.
6. Removal of unsuitable material and its replacement as directed shall be paid on basis of contract conditions relative to changes in work.
7. In general, subgrade shall be established at the following levels:
 - a. For Pavement Areas: Finish grade less the thickness of pavement and base material.
 - b. For Structures: Finish floor elevation less the thickness of the slab and aggregate backfill per Section 3.07.C.
 - c. For Lawn Areas: Finish grade less topsoil thickness.
 - d. Sidewalks and Plazas: Finish grade less sidewalk and aggregate base thickness.
 - e. Landscape Area: Finish grade less topsoil and mulch.

B. Subgrade Preparation:

1. Proof Rolling:
 - a. All subgrade surfaces shall be proof rolled by means of heavy equipment (minimum 30-ton dual axle dump truck) to locate and permit timely correction of the subgrade deficiencies. Proof rolling shall be witnessed by the Testing Agency and approved by Testing Agency prior to continuing work.
 - b. In cut sections, proof rolling of the subgrade surface shall be done to determine the location and extent of areas below subgrade surface that may require subgrade undercutting. Should any portion of the cut subgrade surface fail to provide satisfactory support for the proof-rolling operation, the Testing Agency may order corrective undercut and backfill work done. Refer to Section 3.03, Paragraph A.5 and A.6 for corrective measures.

- c. In embankment sections, prior to placing the embankment, proof rolling on the subgrade surface shall be done to determine the uniformity of the compaction below the subgrade and any deficiencies requiring corrective work. Any deficiencies discovered during proof rolling operations shall be corrected in a manner satisfactory to the Testing Agency. Refer to Section 3.03 Paragraph A.5 and A.6 for corrective measures. After all corrective work has been completed, the surface shall be proof rolled again. Corrective work shall not be considered complete and acceptable until the embankment shows satisfactory and uniform response to the proof rolling operations.
 2. Construction:
 - a. Subgrade shall be shaped to line, grade, and cross section, and compacted as specified. This operation shall include plowing, disking, and any moistening or aerating required to obtain specified compaction. Soft or otherwise unsatisfactory material shall be removed and replaced with satisfactory excavated material or other approved material as directed. Rock encountered in the cut section shall be excavated to a depth of 6 inches below subgrade. Low areas resulting from removal of unsatisfactory material or excavation of rock shall be brought up to required grade with satisfactory materials, and the entire subgrade shall be shaped to line, grade and cross section and compacted as specified. After rolling, the surface of the subgrade for roadways shall not show deviations greater than 1/2 inch when tested with a 12-foot straightedge applied both parallel and at right angles to the centerline of the area. The elevation of the finish subgrade shall not vary more than 0.05 foot from the established grade and cross section.
 3. Compaction:
 - a. Compaction shall be accomplished by sheepfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. Except for paved areas and railroads, each layer of the embankment shall be compacted to a maximum density in accordance with the Compaction Requirements Schedule at this end of this specification.
- C. Embankment:
 1. Initial Lift: After proof rolling of the existing subgrade has been completed, the surface of the area to be filled shall be scarified to a depth of 6 inches. An initial 3-inch layer of fill material shall then be spread over the scarified surface and the entire area compacted as specified.
 2. Fill Lift Thickness: Areas requiring fill shall be filled and backfilled using suitable materials compacted in layers not to exceed the following (all thicknesses are loose thicknesses):
 - a. Within building areas - 8 inches.
 - b. Under pavements, sidewalks or plazas - 8 inches.
 - c. General site fill - 12 inches.
 3. Moisture Content: Placed material shall not deviate from the optimum by more than two percent (+/-2%). Moisture content of any material which displays pronounced deformation under construction equipment shall not exceed the optimum. Drying of wet soil shall be performed with the use of plows, discs, harrows, or other approved methods. If additional water is required, it should be uniformly distributed through the use of approved water wagons and shall be thoroughly incorporated into the material by means of discs or other suitable mixing equipment. Care shall be taken to avoid trapping water within the fill.

4. Amount of Compaction: After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted to not less than the percent shown under the Compaction Requirements Schedule in accordance with ASTM Method (D-698/D-1557).
5. Compaction of Embankment Layers: Compaction equipment shall be of such design that it will be able to compact the fill to the specified density. Compaction of each layer shall be continuous over its entire area and the compaction equipment shall make sufficient trips to ensure that the required density has been obtained.
6. Density Tests: Field density tests shall be made by the Testing Agency per the Compaction Requirements Schedule. Density tests shall be taken in compacted material below the disturbed surface. When these tests indicate that the density of any layer of fill or portion thereof is below the required density, the particular layer or portion shall be reworked until the required density has been obtained.
7. Seasonal Limits: No fill material shall be placed, spread, or rolled while it is frozen or thawing or during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations shall not resume until the Testing Agency indicates that the moisture content and density of the previously placed fill are as specified.
8. Drainage: The embankment and borrow areas should be maintained in a freely draining condition at all times. Proper drainage should be provided for any water or springs which may be encountered.
9. Existing Slopes: When the embankment meets the natural grade of a slope, a bench shall be cut in the existing slope. These cuts are to serve as keys to connect the existing grade with the newly placed fill.
10. Unacceptable Fill Subgrade Material: Frozen fill material or any suitable fill shall not be placed on frozen or snow-covered surfaces.
11. Soft and Wet Soils: If soft, yielding material is encountered in embankments as a result of trapping water, and cannot be satisfactorily stabilized by moisture control and compaction, the unstable material shall be excavated to the depth required by the Testing Agency. The excavation shall then be filled with suitable material and compacted in accordance with the requirements outlined above.
12. Rock: When fill material includes rock, the maximum rock size acceptable shall be 4 inches. No large rocks shall be allowed to nest and all voids must be carefully filled with small stones or earth, properly compacted. No large rocks will be permitted within 12 inches of the finished grade.
13. Shale and Siltstone:
Shale and siltstone embankment materials shall be sprinkled to bring the moisture content to within a range of optimum minus 3% to optimum plus 3%. Compaction shall be accomplished with a vibratory sheepsfoot roller in conjunction with a static sheepsfoot roller. The minimum weight for the static sheepsfoot roller shall be 60,000 lbs. The minimum total compactive effort for the vibratory tamping foot roller shall be 50,000 lbs. in accordance with the manufacturer's Specifications. Larger rollers will be permitted as required to obtain density. At the decision of the Geotechnical Engineer, vibration may not be used on fill materials that are predominately cohesive in nature. Each embankment lift shall receive a minimum of three (3) passes with the static roller and a minimum of two (2) passes with a vibratory roller. The rollers should not exceed three (3) miles per hour during these passes.

Mixtures of shale and siltstone and rock shall be placed in accordance with the above noted provisions for shale and siltstone. Rock in such mixtures shall be reduced in size not to exceed 8 inches or separated from the mixture and placed as rock fill.

14. New Embankment on Existing Slopes: When embankment is to be placed and compacted on hillsides or where new embankment is to be compacted against existing embankments, slopes that are steeper than 8:1 shall be continuously benched over those areas where it is required as the work is brought up in layers. Benching shall be of sufficient width to permit operations of placing and compacting equipment. Each horizontal cut shall begin at the intersection of the original ground and the vertical sides of the previous cuts. Material thus cut out shall be recompacted along with the new embankment.

D. Stabilized Subgrade:

1. Once the Contractor has selected a chemical stabilization, said Contractor shall provide the Testing Agency a sample of significant size for testing.
2. The Testing Agency will perform soils tests and determine the acceptability of the Mixture.
3. The Contractor may be required to prepare alternative additives for testing until a suitable additive is selected.
4. The Testing Agency shall observe and test all subgrade stabilization to confirm acceptance as pavement subgrade.

3.04 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, re-landscaped, or regraded and stockpile in area designated on site.
- B. Seed stockpile in accordance with Section 31 25 00, "Erosion and Sediment Control."

3.05 EXCAVATION

- A. Underpin adjacent structures which may be damaged by excavation work, including utilities and pipe chases.
- B. Excavate subsoil and whatever material encountered required to accommodate slabs-on-grade, paving and site structures, and construction operations.
- C. Machine slope banks.
- D. Excavation cut not to interfere with normal 45 degree bearing splay of foundation.
- E. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- F. Hand trim excavation. Remove loose matter. Compact bottoms of excavations with a plate vibrator if directed by the Testing Agency. All excavations to be protected as work progresses.
- G. Remove lumped subsoil, boulders, and rock greater than 1/3 cubic yard measured by volume.
- H. Notify Testing Agency or Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.
- I. Correct unauthorized excavation at no extra cost to Owner.

- J. Correct areas over-excavated by error at no extra cost to the Owner.
- K. Contractor solely responsible for means and methods employed to excavate materials encountered on site.
- L. It is intent of Contract Documents that excavation cuts be used as forms for vertical surfaces of footings and column pads. Soil conditions which prevent vertical cuts, or excavation characteristics which require forming concrete are responsibility of General Trades Contractor.
- M. Prior to placing concrete for the footings, all foundation excavations shall be inspected and approved by the Testing Agency, for the bearing capacity indicated on the Drawings.

3.06 SUBSOIL PREPARATION FOR PLACING TOPSOIL

- A. Eliminate uneven areas and low spots. Remove debris, roots, branches, stones, in excess of 2 inches in size. Remove subsoil contaminated with petroleum products.
- B. Scarify subgrade to depth of 6 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.07 PLACING TOPSOIL

- A. Place topsoil in areas where seeding, sodding, and planting is scheduled.
- B. Use topsoil in relatively dry state.
- C. Place during dry weather.
- D. Fine grade topsoil eliminating rough or low areas. Maintain levels, profiles, and contours of subgrade.
- E. Remove stone, roots, grass, weeds, debris, and foreign material while spreading.
- F. Manually spread topsoil around trees, plants, curbs to prevent damage.
- G. Roll placed topsoil.
- H. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.08 SCHEDULE OF LOCATIONS

- A. The following paragraphs identify compacted topsoil thicknesses for various locations.
 - 1. Seeded Areas: 6 inches minimum
 - 2. Sod: 6 inches minimum
 - 3. Shrub Beds: 18 inches minimum
 - 4. Flower Beds: 12 inches minimum
 - 5. Planter Boxes: To within 3 inches of box rim

3.09 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed by an independent Testing Agency.

- B. Tests and analysis of fill material will be performed in accordance with ANSI/ASTM C136 and with Division 1.
- C. Compaction testing will be performed in accordance with ANSI/ASTM D2922 and D3017 and with Division 1.
- D. Field density test reports shall clearly identify the following information for each test:
 - 1. Horizontal and vertical location of test
 - 2. Material type being tested
 - 3. Proctor test method
 - 4. Maximum proctor density
 - 5. Specified density
 - 6. Optimum moisture content
 - 7. Field test method
 - 8. Actual moisture content
 - 9. Tested density
 - 10. Pass/fail indication
- E. Do not submit reports of failing tests without follow-up report of reworked area and passing retest. Submitted test reports without specified information will be returned for revisions and resubmittal.
- F. Submit rough draft of daily Field Observation Report to the Engineer via facsimile the day of the field visit. Follow up with formal report.
- G. Excavate, replace at near optimum moisture, recompact and retest all areas failing to meet compaction requirements at no additional cost.

3.10 ACCEPTANCE

- A. Top Surface of Backfilling: Under Paved Areas: Plus, or minus 0.05 feet from required elevations.
- B. Top Surface of General Backfilling: Plus, or minus 0.05 feet from required elevations.

3.11 SCHEDULE OF FILL MATERIAL AND COMPACTION REQUIREMENTS SCHEDULE

- A. Compact fill materials to meet the following minimum Standard Modified Proctor Density, (ASTM D698).

LOCATIONS	MATERIAL TYPES												COMPACTION REQUIREMENTS		
	A I T E M 4 1 1	B P E A G R A V E L	C S A N D	D S U B S O I L	E I T E M 7 0 3 5 7	F T O P S O I L	G C O N C R E T E	H I T E M 7 0 3 8	I C D F	J I T E M 3 0 4	K B A N K R U N G R A V E L	L N S D B	% C O M P A C T I O N	M I N I M U M T E S T	U N I T A R E A / L I F T
Aggregate base under exterior concrete slabs, sidewalks, and plaza areas.	X									X		X	98%	1/1000 SY	
Foundation wall backfill as defined in "Building Fill & Backfill."	X							X					98%	1/100 SY	
Areas to receive asphalt or concrete pavement or walks immediately adjacent to exterior walls.	X							X		X	X		100%	1/500 SY	
Aggregate base beneath interior floor slab.	X				X			X					100%	1/500 SY	
General site fill, both paved and non-paved areas, utility trenches outside paved areas, utility trenches under pavement in excess of 48 inch depth, corrective backfill, areas to receive lawns immediately adjacent to exterior walls.				X									98%	1/1000 SY	
Sewer bedding.					X								N/A	N/A	
Underdrains, french drains, aggregate drainage material behind site retaining walls.					X			X					N/A	N/A	
Abandoned utilities, trench backfill where shown on drawings.									X				N/A	N/A	
Utility trenches less than or equal to 48 inch depth under pavement.	X									X			100%	1/300 LF	
Aggregate base beneath asphalt roads.										X			100%	1/500 SY	
Fill beneath floor slabs and aggregate base or foundations, corrective backfill for over excavation, or fill for removed foundations.	X			X						X	X	X	100%	1/500 SY	
Finish slopes, lawn areas, planters.						X							N/A	N/A	
Sewer Encasement							X								

3.12 PROTECTION OF PERSONS AND PROPERTY

- A. Barricade open excavations occurring and post with warning lights from dusk to dawn each day and as otherwise required.
- B. Erect construction barriers to prevent public access to the area of the Work. Maintain in place throughout the new construction operations. Erection, maintenance, alterations, and removal of the barriers shall be the responsibility of the Contractor.
- C. Do not close or obstruct streets or sidewalks without the proper permit. Conduct operations with minimum traffic interference.
- D. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
- E. Protect public and private property adjacent to and on the job site, including vents, utility lines, roadways, sidewalks, light standards, hydrants, and trees not indicated for removal. Repair damage to the property at no cost to the Owner.
- F. Notify local authorities having jurisdiction of existing damage in adjacent streets or improvements such as paving, curbs, gutters, sidewalks and alley surfacing, prior to start of demolition work. If damage to streets and improvements is discovered after work has commenced, and such damage was not reported before start of work, the Contractor will perform and pay for the necessary repairs.
- G. Maintain and preserve utilities transversing premises as long as they are required. Backfill and compact all excavation made for removal of utilities.
- H. Seal or cap all utility lines leading from demolished structures in accordance with regulations of authorities having jurisdiction.
- I. Before starting work related to existing utilities such as electrical, sewer, water, heat, gas and fire lines that will temporarily discontinue or disrupt service to any existing building, notify the utility companies 72 hours in advance and obtain approval in writing before proceeding with this phase of work.
- J. Earthwork:
 - 1. Stability of temporary excavations:
 - a. All excavations shall be in accordance with OSHA requirements.
 - b. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
 - c. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
 - 2. Shoring:
 - a. Except as specified elsewhere, provide all shoring required for earthwork or required as a result of earthwork for safety of workers, existing structures, public or adjacent properties.
 - b. Provide materials for shoring and bracing in good serviceable condition.
 - c. Establish requirements for shoring and bracing to comply with local codes and authorities having jurisdiction.

- d. Maintain shoring and bracing in excavations regardless of time period excavations will be open.
- K. The Engineer has designed a project which will be safe after full completion. The Engineer has no expertise in, and takes no responsibility for, construction means and methods or job site safety during construction, which are exclusively the Contractor's responsibility. Processing and/or approving submittals made by the Contractor which may contain information related to construction methods or safety issues, or participation in meetings where such issues might be discussed, shall not be construed as voluntary assumption by the Engineer of any responsibility for safety procedures.

END OF SECTION

SECTION 31 23 33
PIPED UTILITIES-BASIC METHODS

PART 1 GENERAL

1.01 DESCRIPTION

- A. This section includes the following:
 - 1. Excavate trenches for utilities from outside building to municipal utilities or as shown on Drawings.
 - 2. Backfilling and compaction.
 - 3. Compacted bedding for utilities.
 - 4. Compaction.

1.02 RELATED SECTIONS

- A. Work under this section is subject to the requirements of the Contract Documents including General Conditions, Supplementary Conditions, Drawings, and sections under Division 01 General Requirements.
- B. Section 01 40 00 - Quality Requirements
- C. Section 31 00 00 - Earthwork
- D. Section 33 11 00 - Water Utilities

1.03 REFERENCE STANDARDS

- A. American Society of Testing and Materials (ASTM).
 - 1. C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
 - 2. D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb. (2.49 kg) Rammer and 12-inch (304.8 mm) Drop.
 - 3. D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557 - Test Methods for Moisture-Density Relations of Soils and Soil -Aggregate Mixtures using 10 lb. (4.54 kg.) Rammer and 18-inch (457 mm) Drop.
 - 5. D2922 - Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).
 - 6. D3017 - Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

- B. City of Columbus; Construction and Materials Specifications (CMSC).**
 - 1. The Terms “Engineer,” “Director,” “City,” and other similar terms shall be interpreted as the Owner.**
 - 2. In the event of any conflicts between CMSC and the Contract Documents, the most stringent shall apply**
 - 3. Local municipality having jurisdiction.**

1.04 SUBMITTALS

- A. Comply with the requirements of Division 1 for submittals and specification section 31 00 00 for bedding and backfill, testing, and sampling requirements.

1.05 QUALITY ASSURANCE

- A. The Testing Agency shall provide compaction testing for bedding and backfill and document any necessary over excavation and stabilization in utility trenches in accordance with Specification Section 31 00 00, "Earthwork."
- B. Coordinate schedule with Testing Agency.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store and grade all materials to prevent their deterioration from weather.
- B. Provide sedimentation and erosion control around stockpiles in accordance with Section 31 25 00, "Erosion and Sediment Control".
- C. Separate work and stockpiles to minimize contamination or mixing of materials.

1.07 PROJECT RECORD DOCUMENTS

- A. Accurately record location of pipe runs, connections, inlets, manholes, valves, fittings, elevations, inverts, and slope gradient.
- B. Provide locations and disposition (active/abandoned) of any utilities encountered during trenching activities.

1.08 LAYOUT

- A. Employ a Professional Surveyor, registered in State of Ohio, to lay out and establish all lines and grades, including centerline of all structural columns.
- B. Erect control points prior to excavation. Protect existing control points.
- C. All surveying costs to be paid by the Contractor performing the work.

PART 2 PRODUCTS

2.01 BACKFILL MATERIALS

- A. As specified in Section 31 00 00, "Earthwork."

2.02 BEDDING MATERIALS

- A. Type B, C, E or G Material: As specified in Section 31 00 00, "Earthwork."

2.03 GEOTEXTILE FABRIC

- A. Fabric: Mirafi Geotextile, 160 N or equal for use with underdrain.

PART 3 EXECUTION

3.01 GENERAL

- A. Provided trenches, bedding and backfill in accordance with specification Section 31 00 00.
- B. Hand trim excavations to required elevations. Correct over excavation with compacted fill material per Section 31 00 00.
- C. Remove large stones or other hard matter which could damage pipe or impede consistent backfilling and compaction.

3.02 EXAMINATION

- A. Site Information: Verify existing utility locations within construction limits.
- B. Locate existing structures and piping to be closed and abandoned.
- C. Identify required lines, levels, contours, and datum.
- D. Maintain and protect existing utilities remaining, which pass through work area. Repair damaged utilities to the satisfaction of the Owner of the utility and the Associate Engineer.

3.03 PROTECTION OF PERSONS AND PROPERTY

- A. The Engineer has designed a project which will be safe after full completion. The Engineer has no expertise in, and takes no responsibility for, construction means and methods or job site safety during construction, which are exclusively the Contractor's responsibility. Processing and/or approving submittals made by the Contractor which may contain information related to construction methods or safety issues, or participation in meetings where such issues might be discussed, shall not be construed as voluntary assumption by the Engineer of any responsibility for safety procedures.
- B. Earthwork:
 - 1. Stability of temporary excavations:
 - a. All excavations shall be in accordance with OSHA requirements.
 - b. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
 - c. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

2. Shoring:

- a. Except as specified elsewhere, provide all shoring required for earthwork or required as a result of earthwork for safety of workers, existing structures, public or adjacent properties.
- b. Provide materials for shoring and bracing in good serviceable condition.
- c. Establish requirements for shoring and bracing to comply with local codes and authorities having jurisdiction.
- d. Maintain shoring and bracing in excavations regardless of time period excavations will be open.

C. Protect plant life, lawns, and other features remaining as a portion of final landscaping.

D. Protect benchmarks, existing structures, sidewalks, paving, and curbs from excavation equipment and vehicular traffic.

E. Protect above and below grade utilities to be removed, abandoned, or remain.

3.04 EXCAVATION

A. Excavate subsoil and whatever material encountered including rock, required for storm sewers, sanitary sewers, water, and gas piping. See rock definition in Earthwork Section. Rock excavation will be paid on a unit price basis.

B. Cut trenches sufficiently wide to enable installation of utilities and allow inspection and as shown on details provided on Drawings.

C. Excavations shall not interfere with normal 45 degree bearing splay of foundations.

D. Hand trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.

E. Remove lumped subsoil, boulders, and rock greater than 1/3 cu. yd. measured by volume.

F. Correct unauthorized excavation in accordance with Section 31 00 00 at no cost to Owner.

G. Correct areas over-excavated by error in accordance with Section 31 00 00 at no cost to Owner.

H. Stockpile excavated material in area designated on site and remove excess material not being used, from site.

I. Cut out soft areas of subgrade not capable of insitu compaction. Backfill with Type D fill and compact to density equal to or greater than requirements for subsequent backfill materials. Corrective undercut and backfill will be paid for per Earthwork Section, Paragraph 3.03, A.6.

J. Dewatering: All excavation, construction and backfill of pipes or other facilities to be constructed under this Contract shall be constructed under dry conditions. The Contractor shall constantly maintain all excavations in a dewatered, workable condition, and shall be responsible for installing, operating, maintaining, and removing such dewatering systems as are required. The evaluation of the sufficiency of the condition shall be made by the Testing Agency and his/her decision shall be binding upon the Contractor. If the Testing Agency determines that dewatering is inadequate, the Contractor shall modify his/her methods until such time as the Testing Agency then agrees with the adequacy of the operating condition.

3.05 BEDDING

- A. Support pipe and conduit during placement and compaction of bedding fill.
- B. Bed per Standard Details provided on Drawings and Schedule at the end of this Section.

3.06 BACKFILLING

- A. Backfill trenches to contours and elevations with unfrozen materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- C. Granular Fill: Place and compact materials in continuous layers not exceeding 8 inches compacted depth.
- D. Soil Fill: Place and compact material in continuous layers not exceeding 8 inches compacted depth.
- E. Employ a placement method that does not disturb or damage conduit in trench.
- F. Maintain optimum moisture content of backfill materials to attain required compaction density.
- G. Leave fill material stockpile areas completely free of excess fill materials.

3.07 MATERIAL SCHEDULE

- A. Waterlines:
 - 1. Bedding Fill: Type E under roadways, parking lots, sidewalks, and plaza areas. Type D in lawn areas, washed, rounded stone (crushed stone not acceptable).
 - 2. In lawn areas, backfill with Type D in 8-inch lifts, compacted to 98%.
 - 3. Under roadways, parking lots, sidewalks, and plaza areas, backfill with Type A or Type J in 8-inch lifts, compacted to 100%.

3.08 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Division 1 and Section 31 00 00.
- B. Tests and analysis of fill material will be performed in accordance with ANSI/ASTM C136 and with Division 1.
- C. Compaction testing will be performed in accordance with ASTM D2922 and ASTM D3017 and with Division 1.
- D. If tests indicate Work does not meet specified requirements, remove Work, replace, and retest, and repeat until a passing test is achieved at no cost to Owner.
- E. Frequency of Tests: Every 100 feet and every lift.

3.09 ACCEPTANCE

- A. Top Surface of Backfilling: Under Paved Areas: Plus, or minus 0.05 feet from required elevations.
- B. Top Surface of General Backfilling: Plus, or minus 0.05 feet from required elevations.

3.10 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Division 1.
- B. Recompact fills subjected to vehicular traffic.

END OF SECTION

SECTION 31 25 00
EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Temporary and permanent erosion and sediment control.
- B. Comply with OEPA requirements and Stormwater Pollution Prevention Plan prepared for this project.

1.02 RELATED WORK

- A. Section 31 00 00, "Earthwork"

1.03 SUBMITTALS

- A. Comply with requirements of Division 0 and 1. Submit material qualification tests and certificates of compliance as indicated.
- B. A stormwater BMPs shall be inspected once every seven (7) days and within 24 hours of a 0.5 inch or greater rainfall. Inspection logs (included herein) shall be kept and shall be submitted to the Owner or Ohio EPA upon request.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Topsoil: Type F Material - Section 31 00 00, "Earthwork."
- B. Filter Barrier Geotextile: The geotextile shall be of either woven or nonwoven construction and consist of long chain polymeric filaments or fibers composed of polypropylene, polyethylene or polyimide. The filament and fibers shall be oriented into a stable network whereby they retain their positions relative with each other. The geotextile shall be ultraviolet stabilized and shall be inert to chemicals commonly found in soil. The geotextile shall meet or exceed physical properties of Supac 5NPUV or Supac G WMUV.
 - 1. Grab Tensile Strength: 90 lb. minimum as measured per test method ASTM D 1682.
 - 2. Mullen Burst Strength: 190 psi minimum as measured per test method ASTM D 3786.
 - 3. Slurry Flow Rate: 0.3 gal./min./ft² maximum.
 - 4. Equivalent Opening Size: 40-80 as measured per test method US Std. Sieve CW-02215.
 - 5. Ultraviolet Radiation Stability: 70% minimum as measured per test method ASTM D 4355.
- C. Filter Barrier Stakes: 2" x 2" x 3'-0" wooden stakes.
- D. Rock Channel Protection: Quarried stone meeting the requirements of ODOT Item 601.09 Rock Channel Protection, Type A, B, C, or D with filter, as noted on Drawings.
- E. Seed and Soil Supplements for Temporary Seeding: Provide seed mixture with 20% by weight of perennial ryegrass, 30% red fescue and 50% Kentucky Blue Grass. Provide pulverized agricultural limestone and commercial fertilizer, 10-20-20 or approved substitute.

- F. Mulch: Unrotted straw free from weeds and course material or other approved product suitable for required application.
- G. Mulch Binder: Cutback or emulsified asphalt or synthetic binder such as Petroset, Terratack or Aerospray.
- H. Jute Matting: Cloth or Plain weave, undyed and unbleached single jute yarn, 47 to 49 inches wide, averaging 1.15 to 1.26 lbs., per lin. yard loosely twisted construction of not less than 1.6 turns per inch, 78 warp ends per width of cloth and 41 weft ends per lin. yard, meeting the requirements of CC Item 671.
- I. Matting Staples; No. 8 plain wire, 6-10 inches long.
- J. Commercial Matting Products: Erosionet, Holdgro, Weedcheck, Curlex or approved equal. Product must cover minimum of 30% of soil surface and meeting the requirements of CC Item 671 ODOT Item 671.

PART 3 EXECUTION

3.01 GENERAL

- A. Provide temporary and permanent erosion and sediment control items as required by governing agency, as required by permit, as indicated on the plans, as noted in this Specification, and as noted in the Stormwater Pollution Prevention Plan.

3.02 INSTALLATION

- A. Install temporary erosion and sediment control items prior to clearing and commencing earthwork or as soon as practical as sitework progresses.
- B. Install required permanent erosion and sediment control items as soon as no damage or deterioration will result to those items due to construction activities.

3.03 TEMPORARY ACCESS ROAD AND CONTRACTOR USE AREA

- A. Locate access road where indicated or as approved by Owner and local authority having jurisdiction over public roads in vicinity of site. Locate use areas where indicated or as convenient.
- B. Access road shall be at least 20 feet wide. All cuts and fill shall be 3:1 or flatter to the extent possible. Drainage ditches shall be provided as needed. The roadbed and use areas surface shall be cleared of all vegetation, roots, and other objectionable material.

- C. The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with stone, as conditions demand, and repair and/or cleanout of any structures used to trap sediment. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately.
- D. All roadside ditches, cuts, fills and disturbed areas adjacent to use areas and access road shall be stabilized with appropriate temporary vegetation immediately after grading.
- E. Both road and use areas may require periodic top dressing with new stone. Seeded areas should be checked periodically to ensure that a vigorous stand of vegetation is maintained. Ditches and other drainage structures should be checked regularly to ensure that they do not become clogged with silt or other debris.

3.04 FILTER FABRIC BARRIERS

- A. Construct where indicated or otherwise required by grading operations to reduce sediment content or runoff.
- B. The height of a filter barrier shall be a minimum of 15 inches and shall not exceed 18 inches.
- C. Filter barrier geotextile shall be purchased in a continuous roll and cut to the length of the barrier to avoid the use of joints.
- D. The stakes shall be spaced a maximum of 3 feet apart at the barrier location and driven securely into the ground (minimum of 8 inches).
- E. A trench shall be excavated approximately 4 inches wide and 4 inches deep along the line of stakes and upslope from the barrier.
- F. The filter material shall be stapled to the wooden stakes, and 8 inches of the fabric shall be extended into the trench. Heavy duty wire staples at least 1/2 inch long shall be used. Filter materials shall not be stapled to existing trees.
- G. The trench shall be backfilled, and the soil compacted over the filter material.
- H. If a filter is to be constructed across a ditch line or swale, the barrier shall be of sufficient length to eliminate end flow, and the plan configuration shall resemble an arc or horseshoe with the ends-oriented upslope.
- I. Filter barrier shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.
- J. Filter barrier shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately.
- K. Should the fabric on the filter barrier become ineffective prior to the end of its need, the fabric shall be replaced promptly.
- L. Sediment deposits should be removed after each rainfall. They shall be removed when deposits reach approximately one-half the height of the barrier.

- M. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform with the existing grade, prepared, and seeded.

3.05 ROCK CHANNEL PROTECTION (RCP) PLACEMENT

- A. Place RCP on bedding layer, where indicated, to produce a well graded mass of rock with minimum practical percentage of voids.

3.06 TOPSOIL STORAGE AND APPLICATION

- A. Stockpile acceptable topsoil generally where indicated and in such a manner that natural drainage is not obstructed, and no off-site sediment damage shall result. Side slopes of the stockpile shall not exceed 2:1.
- B. A perimeter dike with gravel outlet, silt fence, or straw bale barrier shall surround all topsoil stockpiles.
- C. Temporary seeding of stockpiles shall be completed within seven (7) days of the formation of the stockpile.
- D. Before topsoiling, establish indicated and needed erosion and sediment control items such as diversions, berms, dikes, waterways, sediment basin, etc. Previously established grades on the areas to be topsoiled shall be maintained according to the Drawings.
- E. After the areas to be topsoiled have been brought to grade, and immediately prior to dumping and spreading the topsoil, the subgrade shall be loosened by discing or scarifying to a depth of at least 2 inches to insure bonding of the topsoil and subsoil.
- F. Topsoil shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading or proposed sodding or seeding. The topsoil shall be uniformly distributed to a minimum compacted depth of 3 inches on 3:1 or steeper slopes and 4 inches on flatter slopes. Any irregularities in the surface, resulting from topsoiling or other operations, shall be corrected in order to prevent the formation of depressions or water pockets. Avoid undue compaction.

3.07 TEMPORARY FILL DIVERSION

- A. The diversion shall be constructed at the top of the fill at the end of each workday as needed.
- B. The diversion shall be located at least 2 feet inside the top edge of the fill.
- C. The supporting ridge of the lower side shall be constructed with a uniform height along its entire length.
- D. Since the practice is temporary and under most situations will be covered the next workday, the maintenance required should be low. If the practice is to remain in use for more than one day, an inspection will be made at the end of each workday and repairs made to the measure if needed. The Contractor should avoid the placement of any material over the structure while it is in use. Construction traffic should not be permitted to cross the diversion.

3.08 TEMPORARY DIVERSION DIKE

- A. Whenever feasible, the dike should be built before construction begins on the project.
- B. The dike should be adequately compacted to prevent failure.
- C. Temporary or permanent seeding and mulch shall be applied to the dike within fifteen (15) days of construction.
- D. The dike should be located to minimize damages by construction operations and traffic.
- E. The measure shall be inspected after every storm and repairs made to the dike, flow channel, and outlet, as necessary. Approximately once every week, whether a storm has occurred or not, the measure shall be inspected, and repairs made if needed. Damages caused by construction traffic or other activity must be repaired before the end of each working day.

3.09 SEEDING

- A. Incorporate lime and 10-20-20 fertilizer into soil prior to seeding. Apply lime at 900 lbs./1000 S.Y. Apply fertilizer at 200 lbs./1000 S.Y. Apply seed at 25 lbs./1000 S.Y. Within 48 hours after any given area is seeded, straw or hay shall be evenly placed over all seeded areas at the rate of approximately 2 tons per acre for straw, or 3 tons per acre for hay, when seeding is performed between the dates of March 15 and October 15, and the approximate rate of 3 tons per acre straw, or 4 1/2 tons per acre for hay, when seeding is performed between the dates of October 15 and March 15 of the succeeding year. Provide matting where required to establish seed growth.
- B. Areas which fail to establish vegetative cover adequate to prevent rill erosion will be re-seeded as soon as such areas are identified.

3.10 MAINTENANCE

- A. Maintain all erosion and sediment control items until final project acceptance. Repair breaches and replace deteriorated or missing items immediately after discovery.
- B. All stormwater BMPs shall be inspected once every seven (7) days and within 24 hours of a 0.5 inch or greater rainfall. Inspection logs (included herein) shall be kept and shall be submitted to the Owner or Ohio EPA upon request.
- C. Clean sedimentation basins and catch basins as required to maintain effectiveness or as otherwise directed.
- D. Removal: Remove temporary erosion control items as directed and prior to Project close-out.

END OF SECTION

SECTION 32 13 00
RIGID PAVEMENT

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Concrete sidewalks, detectable warnings, curbs, gutters, and streets.
- B. Reinforcement.
- C. Surface finish.
- D. Curing

1.02 WORK INSTALLED BUT FINISHED UNDER OTHER SECTIONS

- A. Not used.

1.03 RELATED WORK

- A. Section 31 00 00, "Earthwork"
- B. Section 32 12 00, "Flexible Pavement"

1.04 REFERENCES

- A. ACI 301 - Specifications for Structural Concrete for Buildings.
- B. ASTM D1751-99 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- C. ASTM D1752-04a – Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
- D. ASTM C33-03 - Standard Specification for Concrete Aggregates.
- E. ASTM C94-04a - Standard Specification for Ready Mixed Concrete.
- F. ASTM C150-04a - Standard Specification for Portland Cement.
- G. ASTM C260-01 - Standard Specification for Air-Entraining Admixtures for Concrete.
- H. ASTM C309-03 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- I. ASTM C494-04 - Standard Specification for Chemical Admixtures for Concrete.
- J. ASTM C920-02 – Standard Specification for Elastomeric Joint Sealants.
- K. ASTM D5249 – Standard Specification for Backer Material for Use with Cold and Hot Applied Joint Sealants in Portland Cement Concrete and Asphalt Joints.

- L. FS TT-C-800 - Curing Compound, Concrete, for New and Existing Surfaces.
- M. State of Ohio Department of Transportation Construction and Material Specifications (CMS) 2019.
- N. City of Columbus, Ohio Construction and Material Specifications (CCMS) 2018.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301.
- B. Obtain materials from same source throughout.
- C. Install curb in accordance with ODOT Item 609.

1.06 REGULATOR REQUIREMENTS

- A. Conform to City code for paving work on public property.

1.07 TESTS

- A. Testing and analysis will be performed under provisions of Division 1.
- B. Submit proposed mix design of each class of concrete to appointed firm for review prior to commencement of work.
- C. Testing firm will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.

1.08 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Include data on joint filler, admixtures, curing compounds.
- C. Submit manufacturer's instructions under provisions of Division 1.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

- A. Cement: ASTM C150-86, Type I, II or III Portland type, gray color.
- B. Fine and Coarse Aggregate: ASTM C33-86.
- C. Water: Potable.

2.02 FORM MATERIALS

- A. Conform to ACI 301.

- B. Joint Filler: ASTM D1751-83.

2.03 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615; 60 ksi yield grade.
- B. Welded Steel Wire Fabric: Plain type, ANSI/ASTM A175; in flat sheets.
- C. Tie Wire: Annealed steel, minimum 16 gauge.
- D. Dowels: ASTM A615; 40 ksi yield grade, plain steel, uncoated finished.
- E. Synthetic Fiber Reinforcement: ASTM C1116-97 and ASTM C1018-97. Acceptable products include, but are not limited:
 - 1. Nycon Nylon Fibers.
 - 2. Forta Nylo-Mono Nylon Fibers
 - 3. Fibermesh Fibermix Stealth Polypropylene Fibers.
 - 4. Grace Polypropylene Fibers
 - 5. Forta Mighty-Mono Polypropylene Fibers

Synthetic fiber reinforcement shall be used in strict accordance with the manufacturer's recommendations. Dosage rate shall be as recommended by the manufacturer, but not less than 1 pound per cubic yard.

2.04 ACCESSORIES

- A. Dissipating Curing Compound: Comply with ASTM C309-19, Type 1, Class A or B (clear), except moisture loss not to exceed 0.40 kg/sq m. in 72 hours. Compound shall comply with EPA's VOC requirements. Apply at the manufacturer's written recommended application rate.
- B. Sealer: Clear membrane-forming compound which will not yellow. Must be formulated for the intended application, either interior or exterior and applied per the manufacturer's written recommendations. Must comply with EPA's VOC requirements and be compatible with the curing compound used.
- C. Penetrating Sealer: Acceptable products include, but are not limited to:
 - 1. L&M Construction Chemicals - Aquapel Plus 40
 - 2. ProSoCo - Saltguard WB
 - 3. Huls America Inc. - Chem-Trete BSM 40
 - 4. Master Builders Inc. - Masterseal SL 40
 - 5. Lyntal International - Iso-Flex 618-50 WB
 - 6. BASF - Enviroseal 40 or Hydrozo Silane 40
 - 7. Tex-Cote - Rainstopper RS140

- D. Expansion, Isolation, and Construction Joints:
1. Pre-formed Joint Filler: Non-impregnated type, closed cell resilient polyethylene foam, 1/2 inch thick unless otherwise noted. Meet or exceed requirements of ASTM D 1752, Sections 5.1 through 5.4, and ASTM D 5249, Type 2. Ceramar Flexible Foam Expansion Joint by W.R. Meadows or approved equal.
 2. Joint Cap: Two piece vinyl device with upper 1/2 inch removable after curing period. Width corresponding to joint filler. Products by Greenstreak Plastic Products, Vinylex Corp., Vulcan Metal Products, or approved equal.
 3. Joint Sealant: High performance, self leveling, elastomeric polyurethane sealant conforming to ASTM C-920. Sikaflex 1CSL or approved equal.

2.05 ADMIXTURES

- A. Air Entrainment: ASTM C260-86.
- B. Chemical Admixture: ASTM C494-86, Type A or D - water reducing, Type C or E - accelerating.

2.06 CONCRETE MIX

- A. Mix concrete in accordance with ASTM C94.
- B. Provide concrete for the following characteristics:
- Compressive Strength at 28 days: 4000 psi.
 - Min cementitious materials content 564 lbs./cu. yd.
 - Max water-cementitious ratio 0.45, air content 6+1, -1.5%
- C. Use accelerating admixtures in cold weather only when approved by Architect/Engineer. Use of admixtures will not relax cold weather placement requirements.
- D. Use set-retarding admixtures during hot weather only when approved by Architect/Engineer.
- E. Add air entraining agent to concrete mix for concrete work exposed to exterior.
- F. Concrete mixes shall not contain any deleterious or other reactive aggregates or materials that can initiate and promote alkali silica reaction (ASR).

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify compacted subgrade or granular base stabilized soil is ready to support paving and imposed loads.
- B. Proof roll subgrade and correct any areas determined unacceptable to Testing Agency immediately prior to placement of concrete pavement.
- C. Verify gradients and elevations of base are correct.

- D. Beginning of installation means acceptance of existing conditions.
- E. Proof roll prior to base placement.

3.02 REINFORCEMENT

- A. Place reinforcement at mid-height of slabs-on-grade.
- B. Interrupt reinforcement at expansion joints.
- C. Place reinforcement to achieve slab and curb alignment as detailed.
- D. Provide dowelled joints at interruptions of concrete with one end of dowel set in capped sleeve to allow longitudinal movement, per ODOT Item 451.

3.03 JOINTS

- A. Location: Locate as shown on drawings. In absence of information on drawings, provide joints as specified below.
- B. Control Joints: Created within 8 hours of concrete placement. Sawed typical, tooled where allowed by the Engineer.
 - 1. Slabs:
 - a. Spacing (in feet) shall be between 2 to 2-1/2 times slab thickness (in inches) in both directions, i.e. 4-inch thick slab shall have joint spacing at 8 foot to 10 foot centers.
 - b. Grid of control joints to be approximately square with longest side to be not longer than 1.5 times the shortest side, i.e. 4-foot wide walk shall have joint spacing at 4 feet to 6 feet maximum.
 - c. Depth of Joint: 1/4 of slab thickness.
 - d. Width of Joint: 1/8 inch.
 - 2. Curbs:
 - a. Maximum 10 feet on center. Aligned with joints in adjacent vehicular paving and sidewalks.
 - b. Depth of Joint: 1-1/2 inches minimum.
 - c. Width of Joint: 1/8 inch.
- C. Isolation Joints: Formed before concrete placement.
 - 1. Location in Slabs and Curbs: Provide where slabs and curbs abut vertical surfaces: at intersections of sidewalks, abrupt changes in slab width, walls, columns, pole bases, outside face or edge of curbs, and manholes, catch basins, or curb inlets.
 - 2. Joint: Provide 1/2 inch wide Pre-formed Joint Filler with removable 3/8 inch deep Joint Caps. Joint Cap shall be set to finish grade elevation. After concrete has set, Joint Cap shall be removed and filled with 3/8 inch of Joint Sealant. Clean joint surfaces free from dirt, dust, and other contaminants that may affect the bond of the joint sealant material. Install Joint Sealant per manufacturer's specifications
 - a. Slabs: Provide Pre-formed Joint Filler to full depth of slab minus 3/8 inches to allow for installation of Joint Cap and Joint Sealant.
 - b. Curbs: Provide Pre-formed Joint Filler to full depth of curb. Joint Filler material shall be cut to match contour of face of curb minus 3/8 inches to allow for installation of Joint Cap and Joint Sealant.

- D. Expansion Joints: Formed before concrete placement. Provide when specifically shown on the drawings or when placing concrete during temperatures less than 40 degrees Fahrenheit.
 - 1. Location:
 - a. Slabs: Space maximum of 25 feet on center.
 - b. Curbs: Align with joints in pavement. In absence of concrete pavement, provide at intervals not exceeding 25 feet.
 - 2. Joint: Provide 1/2 inch wide Pre-formed Joint Filler with removable 3/8 inch deep Joint Caps. Joint Cap shall be set to finish grade elevation. After concrete has set, Joint Cap shall be removed and filled with 3/8 inch of Joint Sealant. Clean joint surfaces free from dirt, dust, and other contaminants that may affect the bond of the joint sealant material. Install Joint Sealant per manufacturer's specifications
 - a. Slabs: Provide Pre-formed Joint Filler to full depth of slab minus 3/8 inches to allow for installation of Joint Cap and Joint Sealant.
 - b. Curbs: Provide Pre-formed Joint Filler to full depth of curb. Joint Filler material shall be cut to match contour of face of curb minus 3/8 inches to allow for installation of Joint Cap and Joint Sealant.
- E. Construction Joints: Clean, formed joints shall be set at predetermined locations and/or when 30 minutes elapses between successive pours of concrete.
 - 1. Slabs: Provide Pre-formed Joint Filler, Joint Cap, and Joint Sealant at predetermined location. Joint shall be similar to Isolation Joint specified previously.
 - 2. Curbs: Provide Pre-formed Joint Filler, Joint Cap, and Joint Sealant at predetermined location. Joint shall be similar to Isolation Joint specified previously.

3.04 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301.
- B. Hot Weather Placement: ACI 305.
- C. Cold Weather Placement: ACI 306.
- D. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.
- E. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.
- F. Excavate, shape and compact subgrade for suitable bearing surface. Remove unacceptable material. Remove all roots occurring within 12 inches of nearest concrete surface. Fill depressions with acceptable material and compact.
- G. Place, shape, and compact aggregate base to required section and grade. Provide 4 inch base course unless indicated otherwise.
- H. Provide suitable forms of metal, wood or as approved to contain concrete to indicated line, grade and shape until set. Provide face forms for curb and other sections free of defects and conforming to indicated shapes. Provide side forms to full depth of concrete. Use approved flexible forms or curved forms of proper radius on curves having a radius of 150 feet or less.

- I. Coat all forms with form treating material prior to placing concrete to prevent concrete damage during form removal.
- J. Concrete mixing: ACI 301, Chapter 7, ready-mixed unless permission is given to site mix.
- K. Place control, isolation, and expansion joints as indicated on Drawings and as specified previously.
- L. Immediately before concrete placement, thoroughly wet all moisture absorbing material that will be in contact with the concrete. Standing water not permitted.
- M. Place concrete in forms without segregation. Vibrate or hand tamp to remove voids. Strike off concrete and float smooth.
- N. Do not place concrete on frozen ground.
- O. Finish concrete as specified.
- P. Place backfill using required material as soon as possible without damaging concrete.
- Q. Repair or remove and replace damaged concrete as directed. Conform to ACI 301, Chapter 9.
- R. Curing:
 - 1. ACI 301, Chapter 12. Use waterproof sheet materials or liquid membrane.
 - 2. Surfaces which are to receive penetrating sealer are to be moist-cured without the use of a curing compound.
 - 3. Dissipating curing compound may be used, if completely removed prior to application of penetrating sealer.
- S. Place expansion joints as indicated on Drawings. In addition, place where concrete surrounds or adjoins any existing fixed objects such as fire hydrants, columns, building foundations, and other rigid structures.
- T. Maximum allowable deviation of formed edges from indicated location: 1/2 inch. Maximum allowable deviation of surface: 1/8 inch when checked with a 10 foot straight edge. Remove to nearest joint and replace any walk or slab exceeding stated deviations.
- U. Slope walks and slabs away from buildings as indicated but not less than 1/8 inch per foot. Maintain design drainage grades to avoid low spots trapping water.
- V. After water sheen has disappeared, lightly brush surface to a uniform texture unless otherwise indicated or directed. Edge joints to provide a smooth border around each panel.
- W. Appearance: Take special precautions in material sources, mixing, delivery, and placement of walks to insure uniform appearance and coloration throughout the entire walkway. Variations in coloration, texture, and finish of any given type of walkway will be unacceptable.
- X. Do not remove forms for minimum of 12 hours after finishing.

3.05 FINISHING

- A. Sidewalk Paving: Light broom, radiused and trowel joint edges.
- B. Curbs and Gutters: Light broom.
- C. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.06 PENETRATING SEALER

- A. Remove all dust, dirt, laitance, and other contaminants. Remove curing compound completely, if used.
- B. Provide test patches as required to ensure compatibility and effectiveness.
- C. Apply with spray or roller, at the manufacturer's written recommended coverage rate, to the following surfaces:
 - 1. Horizontal top surface of all concrete exposed to the weather.
 - 2. Vertical surfaces of columns, walls, curbs, etc. within 12 inches of a treated horizontal surface.
- D. Entire application is to be in strict conformance with the manufacturer's written requirements.

3.07 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Division 1.
- B. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.08 PROTECTION

- A. Immediately after placement, protect concrete under provisions of Division 1 from premature drying, excessive hot or cold temperatures, and mechanical injury.

END OF SECTION

AMERISTAR® PERIMETER SECURITY USA INC.
Stalwart® II Daycare | Anti-Ram Barrier – PU30/P2 Engineered Cable System
Construction Specification 32 30 00 11

PART 1 – GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the anti-ram barrier system defined herein at (specify project site).

1.02 RELATED WORK

Section ____ - Earthwork

Section ____ - Concrete

1.03 SYSTEM DESCRIPTION

The manufacturer shall supply a total anti-ram cable barrier system of the Ameristar® Stalwart II® Majestic PU30/P2 Engineered design. The system shall include all components (i.e., cables, supports, panels, posts, and hardware) required. The barrier shall comply with Ameristar's Stalwart II PU30/P2 System Drawings (supplied upon request).

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified. Installation contractor used for this scope of work must provide documentation from the manufacturer showing completion of core training on Stalwart anti-ram barrier systems.

1.05 REFERENCES

- ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
- ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus.
- ASTM D523 - Test Method for Specular Gloss.
- ASTM D714 - Test Method for Evaluating Degree of Blistering in Paint.
- ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
- ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
- ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.
- ASTM F2656 – Standard Test Method for Vehicle Crash Testing of Perimeter Barriers
- Federal Specification RR-W-410E / Wire Rope and Strand.
- ASTM F2408 – Ornamental Fences Employing Galvanized Steel Tubular Pickets.

1.06 SUBMITTAL

The manufacturer's literature shall be submitted prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

PART 2 – MATERIALS

2.01 MANUFACTURER

A. The anti-ram cable barrier system shall conform to the Stalwart II Majestic PU30/P2 Engineered design, manufactured by Ameristar Perimeter Security USA Inc., in Tulsa, Oklahoma. This system shall be PU30/P2 Engineered based on test results of similar design. Engineering analysis shall be based upon ASTM F2656, Impact

Condition Designation PU30, Penetration Rating P2, with capability of stopping a 5,070 lb vehicle traveling at speeds up to 30 mph.

B. The integrated steel fence panel shall conform to Montage Plus Ornamental Steel, Majestic design, 3" picket spacing, flush bottom rail treatment, 3-Rail style manufactured by Ameristar Perimeter Security USA Inc., in Tulsa, Oklahoma.

C. The entire anti-ram barrier system, and all associated panels, gates, accessories, fittings, and fasteners shall be obtained from a single source.

2.02 MATERIAL

A. Steel material for cable-supporting framework (i.e., rails and I-beam posts) shall be galvanized prior to forming and shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi (310 MPa). The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.90 oz/ft² (276 g/m²), Coating Designation G-90. Steel material for fence panels shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi (310 MPa) and a minimum zinc (hot-dip galvanized) coating weight of 0.60 oz/ft² (184 g/m²), Coating Designation G-60.

B. The fence panel rails shall be steel channel, 1.5" x 1.4375" x 14 Ga. Picket holes in the rail shall be spaced 4.675" o.c. Material for pickets shall be 3/4" square x 18 Ga. tubing. The cross-sectional shape of the anti-ram rails shall conform to the manufacturer's Stalwart II rail design a nominal 2" x 2" x 11 Ga. Tamperproof fasteners shall be used to fasten each fence panel to post bracket and rail to post connections. Posts shall conform to the manufacturer's Stalwart II I-Beam design with a nominal 3" x 2.75" x 12 Ga.

C. The cable material shall be Independent Wire-Rope Core (IWRC) wire rope conforming to Federal Specification RR-W-410E, 6 x 36 Warrington Seale, preformed, right regular lay, medium lubrication, Extra Improved Plow Steel (EIPS), with a breaking strength of 103,400 pounds (51.7 tons). Cable diameter shall be 1 inch.

2.03 FABRICATION

A. Stalwart II rails and posts shall be pre-cut to specified lengths. Post flange shall be pre-punched to accept rail to post and fence panel to post bracket attachment. Post web shall be punched providing a clear opening for interior of rails to align throughout the entire system for affixing conduit, video cabling, IDS wiring, and other components for a complete systems integration. Stalwart II rails shall be attached to I-beam post flange providing a bracket-less design at each intermediate post.

B. Fence panel pickets and rails shall be pre-cut to specified lengths. Pickets shall be inserted into the pre-punched holes in the rails and shall be aligned to standard spacing using a specially calibrated alignment fixture. The aligned pickets and rails shall be joined at each picket-to-rail intersection by Ameristar's proprietary fusion welding process, thus completing the rigid panel assembly.

C. The manufactured galvanized anti-ram framework and fence panels shall be subjected to the PermaCoat[®] thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, as a minimum, a six-stage pretreatment/wash, an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish. The base coat shall be a thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils (0.0508mm). The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be black. The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 1.

D. The manufactured fence panel shall be capable of meeting the vertical load, horizontal load, and infill performance requirements for commercial weight fences under ASTM F2408.

PART 3 - EXECUTION

3.01 PREPARATION

- A. The purchaser shall indicate the location of barrier line with suitable stakes. Stake intervals shall not exceed 500 ft or line of sight.
- B. The purchaser shall indicate all underground utility locations, USC&G benchmarks, property monuments, and other underground structures.
- C. Before installing the Stalwart II Daycare Anti-Ram Cable System, all necessary site clearing and grading shall be performed by the purchaser. An adequate clearance on both sides of the cable barrier line is required.
- D. Installation contractor for this scope of work must be capable of bonding projects up to \$3 million and must demonstrate such with a letter from a reputable bonding entity with the bid documents.
- E. Installation contractor for this scope of work must provide documentation from the product manufacturer indicating they have been trained on installation practices for Stalwart anti-ram systems by the product manufacturer, documentation shall be provided with bid documents.
- F. Installation contractor for this scope of work must provide documentation with bid indicating that the company currently has in place a minimum \$2 million in general liability coverage as well as a minimum \$1 million in commercial vehicle insurance, documentation shall be provided with bid documents.

3.02 INSTALLATION

- A. The Stalwart II barrier shall be installed per Ameristar's System Drawings. Fence panels, brackets, cabling, and fasteners shall be installed according to installation instructions and drawings. Posts and bollards shall be installed per product drawings and installation instructions. The "Earthwork" and "Concrete" sections of this specification shall govern material requirements for the concrete footer unless otherwise specified by the product drawings or installation instructions.

3.03 FENCE INSTALLATION MAINTENANCE

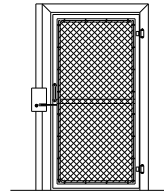
When cutting/drilling rails or posts adhere to the following steps to seal the exposed steel surfaces; 1) Remove all metal shavings from cut area. 2) Apply zinc-rich primer to thoroughly cover cut edge and/or drilled hole; let dry. 3) Apply 2 coats of custom finish paint matching fence color. Failure to seal exposed surfaces per steps 1-3 above will negate warranty. Ameristar spray cans or paint pens shall be used to prime and finish exposed surfaces; it is recommended that paint pens be used to prevent overspray. Use of non-Ameristar parts or components will negate the manufactures' warranty.

3.04 CLEANING

The contractor shall clean the jobsite thoroughly to ensure it is left neat and free of any debris caused by the installation of the cable system.

Table 1 – Coating Performance Requirements		
Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 3,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

**2150 PEDESTRIAN SWING GATE
WITH PANIC BAR AND
ELECTRIC STRIKE
(WELDED WIRE MESH)**



PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. The work in this section shall include furnishing all labor, materials, equipment and appliances necessary to complete installation of Pedestrian Swing Gate System(s) required for this project in strict accordance with this specification section and drawings.

1.02 REFERENCES:

- A. American Welding Society AWS D1.1 / D1.1M Structural Welding Code. See 1.04 C.
- B. ASTM A 123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel.

1.03 SUBMITTAL:

A. Product Data:

- 1. Provide manufacturer's catalog cuts with printed specifications and installation instructions.
- 2. Furnish detailed sequence of operation (description of system).

B. Certifications

- 1. The steel welders and welding process must be certified per section 1.08 A-2.

1.04 PEDESTRIAN SWING GATE MANUFACTURERS:

- A. The Pedestrian Swing Gate Systems shall be manufactured by Tymetal Corp., 678 Wilbur Avenue, Greenwich, NY 12834 – (800) 328 – 4283.
- B. Approved substitution – All other pedestrian swing gate systems must be submitted to the design team in accordance with substitution requirements as set forth in the general provisions of the project manual for approval prior to the bid date. Products submitted after the bid date will not be approved.
- C. Gate manufacturer shall provide independent certification as to the use of a documented Welding Procedure Specification and Procedure Qualification Record to ensure conformance to the AWS D1.1 / D1.1M Structural Welding Code – Steel. Upon request, Individual Certificates of Welder Qualification documenting successful completion of the requirements of the AWS D1.1 / D1.1M code shall also be provided. See 1.08 A.2.

- D. Store gate frames on building site, in an upright position, under cover, on wood sills or floors, and in a manner that prevents rust or damage. Ventilate canvas or plastic covers to prevent moisture traps.

1.05 SYSTEM DIMENSIONS:

- A. Each gate shall have a clear gate opening width of 5' and a gate height of 7'-0". Custom sizes are available.

1.06 SYSTEM FUNCTION:

A. General Description:

1. Pedestrian Swing Gate System shall be designed as an exterior security swing gate.
2. The swing gate(s) shall be pre-assembled, pre-hung and tested at the manufacturer's location.

B. Operation:

1. When the gate is in the closed position, it shall be impossible for the gate to be opened except by electrical or mechanical means.

C. Pedestrian Swing Gate Lock:

1. An electric strike shall be installed in the gate jamb. The electric strike shall unlock / release as activated by a card reader, keypad, push button or other input device.
2. Gate shall be furnished with a panic bar and trim kit, to allow free exiting and keyed entry from the opposite side.

D. Self-Closing:

1. The Pedestrian Swing Gate System shall be equipped with a door closer.

E. Door Position Indication Switch:

1. The Pedestrian Swing Gate System shall be equipped with a door position switch.

1.07 SYSTEM COMPONENTS:

A. Security Gate Panel Filler:

1. Gate panel filler shall be ½" x 3" x 8 gauge weld mesh. Optional gate filler (example: chain link mesh or ornamental picket) can be added.

B. Coating:

1. The entire gate frame and door assembly shall be hot-dip galvanized after fabrication and welding.

C. Hinges:

1. Two (2) needle bearing hinges per gate shall be furnished and shall have a thrust capacity (door weight) of 600 lbs per pair.

D. Panic Bar with Electric Strike:

1. An electric strike shall be installed in the gate jamb.
2. Gate shall be furnished with a Detex panic bar and trim kit, to allow free exiting and keyed entry from the opposite side.

E. Door Closer:

1. Door closer case and internal parts shall be steel and cast iron with constant viscosity liquid from 120 degrees F to -30 degrees F. Rust inhibitor paint shall be applied.

F. Door Pulls:

1. Door pulls shall be Tymetal standard pull.

G. Door Position Indicator Switch:

1. Rotary door position switch shall be TYM – 8750/16353.

1.08 FABRICATION:

A. General:

1. Pedestrian Swing Gate systems (gate, hardware, in-fill, locking and status devices) shall be fully assembled at the factory and shipped to the project site ready for installation.
2. All welds on the gate frame shall conform to Welding Procedure Specification and Procedure Qualification Record to ensure conformance to AWS D1.1 / D1.1M Structural Welding Code – Steel. All individual welders shall be certified to AWS D1.1 / D1.1M welding code. See 1.04 C.
3. Steel members shall be straight, true and free from dents, buckle, twist or rough edges. All joints shall be tight metal-to-metal welded finish. All welds shall show uniform section and deep penetration. Clean weld spatter off so that surfaces are easily cleaned.
4. The entire gate frame and door assembly shall be hot-dip galvanized after fabrication and welding.

B. Frames, Stiles and Rails:

1. Steel members shall be tubular in cross-section with a minimum wall thickness of 3/16" (5mm). Members shall be mitered and welded at the corners.

1.09 FINISH:

A. Galvanizing:

1. The entire gate frame and door assembly shall be hot-dip galvanized after welding.

B. Color Coating (optional):

1. The entire gate frame and door assembly shall be color/powder coated after galvanizing.

1.10 SITE INSPECTION:

- A.** Final grades and installation conditions shall be examined. Installation shall not begin until all unsatisfactory conditions are corrected.

1.11 INSTALLATION:

- A.** Equipment in this section shall be installed in strict accordance with the company's printed instructions unless otherwise shown on the contract drawings.

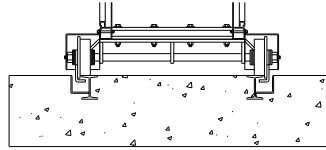
1.12 SYSTEM VALIDATION:

- A.** The complete system shall be adjusted to assure it is performing properly.
- B.** The system shall be operated for a sufficient period of time to determine that the system is in proper working order.

NOTE: Tymetal Corp. reserves the right to modify and/or make changes as deemed necessary without previous notice.

Specification Section 32 31 00

**TYM-HYD BOX FRAME ROLLER
GATE SYSTEM WITH
HYDRAULIC OPERATOR
(ORNAMENTAL)**



PART 1 - GENERAL:

1.01 SECTION INCLUDES:

- A. The work in this section shall include furnishing all labor, materials, equipment and appliances necessary to complete all Fortress Box Frame Roller Gate and Hydraulic Operator System(s) required for this project in strict accordance with this specification section and drawings.

1.02 REFERENCES:

- A. Underwriters Laboratory Gate Operator Requirements (UL 325).
 - 1. Operators shall be built to UL 325 standards and be listed by a testing laboratory. Complete all electrical work according to local codes and National Electrical code. All fieldwork shall be performed in a neat and professional manner, completed to journeyman standards.
 - 2. Current safety standards require the use of multiple external sensors to be capable of reversing the gate in either direction upon sensing an obstruction. See 2.02 D.
 - 3. Pedestrians should never use vehicle gates. Separate pedestrian gates must always be provided when foot traffic is present.
 - 4. Current safety standards require gate operators to be designed and labeled for specific usage classes. Hydraulic Operator Model TYM-HYD-VF2/3 is compliant in usage Classes III and IV.
- B. ASTM F 2200 Standard Specification for Automated Vehicular Gate Construction. See 2.04 C.
- C. American Welding Society AWS D1.2 Structural Welding Code. See 2.04 D.
- D. ASTM A 123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel.

1.03 SUBMITTALS:

- A. Product Data:
 - 1. Provide manufacturer's catalog cuts with printed specifications and installation instructions.
 - 2. Deliver two (2) copies of operation and maintenance data covering the installed products, including name, address and telephone number of the nearest fully equipped service center.

3. Each operator shall bear a label indicating that the operator mechanism has been tested for full power and pressure of all hydraulic components, full stress tests of all mechanical components and electrical tests of all overload devices.
- B. Shop Drawings:**
1. Supply shop drawings showing the relationship of operating systems with gate components, including details of all major components.
 2. Include complete details of gate construction, gate height and post spacing dimensions.
- C.** Each operator shall bear a label indicating that the operator mechanism has been tested for full power and pressure of all hydraulic components, full stress tests of all mechanical components and electrical tests of all overload devices.
- D. Certifications:**
1. The aluminum welders and welding process for gate manufacture must be certified per section 2.04 D.
 2. Operator Manufacturer: A company specializing in the manufacture of hydraulic gate operators of the type specified, with a minimum of ten years experience.
 3. Installer: A minimum of three years experience installing similar equipment.

PART 2 - PRODUCTS:

2.01 HYDRAULIC GATE OPERATORS:

- A.** Hydraulic Gate Operator TYM-HYD-VF2/3 with controller to be supplied by Tymetal Corp., 678 Wilbur Avenue, Greenwich, NY 12834 – (800)-328-4283.

2.02 OPERATION:

- A.** Operation shall be by means of a metal rail passing between a pair of aluminum alloy wheels with polyurethane treads. Operator drive wheels will be driven using hydraulic motors, and system shall not include belts, gears, pulleys, roller chains or sprockets to transfer power from operator to gate panel. The operator shall generate a minimum horizontal pull of 300 lb (136 kg) without the drive wheels slipping and without distortion of supporting arms. Operator shall be capable of handling gates weighing up to 5,000 lb (2,200 kg). The operator shall be speed controlled by an electronic Variable Frequency Drive (VFD) which will accelerate and decelerate the gate gradually to prevent shock loads to the gate and operator assembly. The maximum gate velocity of the TYM-HYD-VF2/3 shall be selectable between 2.2 ft/s (670 mm/s) and 3 ft/s (914 mm/s). The operator shall contain an Emergency Fast Operation (EFO) mode wherein a separate continuous input allows the operator to override all safety inputs and run at the EFO speed. The gate velocity during Emergency Fast Operation (EFO) shall not be less than 3 ft/s (914 mm/s). Upon starting, the VFD will gradually accelerate the gate to its operating speed. When at the slow down limit, the VFD will gradually reduce gate velocity to 1 ft/s (304 mm/s), thereafter, at the stop limit, the VFD will slow the electric motor and gate to a gradual stop. Two adjustable hydraulic brake valves (one for each direction) assist in slowing the gate to a precise stop.
- B.** Standard mechanical components shall include as a minimum:

1. Supporting arms: Cast aluminum. Arms shall incorporate a low-speed sleeve bearing acting on arm pivot pins. (item 2 below)
2. Arm pivot pins: 3/4" (19 mm) diameter, stainless steel, with integral tabs for ease of removal.
3. Tension spring: 2 – 2 1/2" (51mm - 63 mm) medium to heavy duty, minimum 500 lb (226 kg) capacity.
4. Tension adjustment: Finger tightened nut, not requiring the use of tools.
5. Drive release: Must instantly release tension on both drive wheels and disengage them from contact with drive rail in a single motion, for manual operation.
6. Limit sensors or switches: Fully adjustable,
 - a. Switches - toggle types, with stripped ends to VFD.
 - b. Sensors – hall effect, jacketed cable, stripped ends to VFD.
7. Chassis: 1/4" (6 mm) steel base plate and 12 Ga. (3 mm) sides and back welded and ground smooth.
8. Cover: 10 Ga. zinc plated steel with textured TGIC gray polyester powder coat finish. All joints welded, filled and ground smooth. Finished corners square and true with no visible joints.
 - a. The cover shall have a detention quality mogul lock.
9. Finish: Zinc substrate with textured powder coat finish, tested to withstand 1,000 hour salt spray test.
10. Drive wheels: Two 8" diam (203 mm) AdvanceDrive™ wheels. Aluminum alloy with polyurethane over mold.
11. Drive rail: Shall be extruded 6061 T6, not less than 1/8" (3 mm) thick. Drive rail shall incorporate roll pins for ease of replacement or splicing. Pins shall enable a perfect butt splice.
12. Hydraulic hose: Shall be 3/8" (9.5 mm) reinforced, synthetic, abrasion resistant, rated to 3,000 psi or greater (20.6 MPa).
13. Hydraulic valves: Shall be individually replaceable cartridge type, in an integrated hydraulic manifold.
14. Hose fittings: At manifold shall be quick-disconnect type, others shall be swivel type.
15. Hydraulic fluid: High performance type with a viscosity index greater than 375 and temperature range -40° F to 158° F (-40° C to 70° C).
16. 0 – 3000 psi pressure transducer with a digital readout on the control board shall be standard. The hydraulic fluid reservoir shall be formed from a single piece of metal, non-welded, and shall be powder painted on the inside and the outside, to prevent fluid contamination.

C. Minimum standard electrical components:

1. Pump motor: 2 hp, 3450 RPM, three phase. (Note, the VFD converts single phase input power to drive the three phase motor)
2. VFD: 2 hp, Modbus monitored and controlled.
3. All components shall have overload protection.
4. Electrical enclosure: metal, with hinged plastic lid for protection from intrusion of foreign objects.
5. 1 directional valve control solenoid.
6. Multi-function button to wake menu screen without opening the lid.
7. Controls: SmartTouch 725 Controller containing:
 - a. inherent entrapment monitoring (UL 325, Type A);
 - b. built in audible "warn before operate" system;

- c. built in timer to close;
 - d. 32 character OLED display for reporting of functions and codes with 7 button user interface;
 - e. multiple programmable options for output relays or sensor inputs;
 - f. two user programmable inputs;
 - g. two user programmable monitored sensor inputs;
 - h. anti-tailgate mode;
 - i. menu configuration, event logging and system diagnostics easily accessible with a USB flash drive or HySecurity's Installer Phone App;*
 - j. embedded web server capable of sending alerts, faults and errors via e-mail;*
 - k. web based user interface allowing secure login to operator for remote operations and diagnostics;*
 - l. four inputs for Hy5B vehicle detector loops;
 - m. OXI antenna/receiver input for use with NICE OXI receivers and fobs;
 - n. one electromechanical and two solid state relays;
 - o. HS-1 for I/O Expansion Module;
 - p. HS-2 for ModBus to VFD;
 - q. RS485 and ethernet for network connections;*
 - r. USB port for firmware updates and troubleshooting logs;
 - s. sequenced and dual gate connections;
 - t. BlueBUS input for use with NICE BlueBUS devices;
 - u. emergency input programmable for emergency open or close remote or radio input;
 - v. open, close, stop inputs for remote or radio inputs. Transformer: 75 VA, non-jumpered taps, for all common voltages.
8. Power supply, 24 VDC, 5 A output, variable voltage input.
- D.** Required external sensors: See 1.02 A2. Specify photo eyes or gate edges or a combination thereof to be installed such that the gate is capable of reversing in either direction upon sensing an obstruction.
- E.** Optional control devices: (consider one or more of the following: card reader, key-switch, radio control, pushbuttons, vehicle detectors, keypads or seven day timers).
- F.** 208-230 60 hz VAC single phase, 220 50 hz VAC single phase, 208-230/460 60 hz VAC three phase, and 220/380/440 50 hz VAC three phase available. 115 VAC single phase is not available.

2.03 FACTORY TESTING:

- A.** Fully assemble and test, at the factory, each gate operator to assure smooth operation, sequencing and electrical connection integrity. Apply physical loads to the operator to simulate field conditions. Tests shall simulate physical and electrical loads equal to the fully rated capacity of the operator components.
- B.** Check all operator mechanical connections for tightness and alignment. Check all welds for completeness and continuity. Check welded corners and edges to assure they are square and straight.
- C.** Inspect operator painted finish for completeness and gloss. Touch up imperfections prior to shipment.
- D.** Check all hydraulic hoses and electrical wires to assure that chafing cannot occur during shipping or operation.

2.04 BOX FRAME ROLLER GATES:

- A.** Tymetal Corp., 678 Wilbur Avenue, Greenwich, NY 12834 – (800) 328-4283, shall manufacture the Box Frame Roller Gate(s).
- B.** Approved Substitution: All other systems must be submitted to the design team in accordance with substitution requirements as set forth in the general provisions of the specification manual for approval prior to the bid date. Products submitted after the bid date will not be approved.
- C.** Gate manufacturer shall certify gate is manufactured in compliance with ASTM F 2200, Standard Specification for Automated Vehicular Gate Construction and the operators are UL 325 listed. See 1.02 B and 1.02 A.
- D.** Gate manufacturer shall provide independent certification as to the use of a documented Welding Procedure Specification and Procedure Qualification Record to insure conformance to the AWS D1.2 welding code. Upon request, Individual Certificates of Welder Qualification documenting successful completion of the requirements of the AWS D1.2 code shall also be provided. See 1.02 C.

2.05 GATE CONSTRUCTION DETAILS:

- A. Gate Frame:**
 - 1. All welds on the gate frame shall conform to Welding Procedure Specification and Procedure Qualification Record to insure conformance to the AWS D1.2 Structural Welding Code. All individual welders shall be certified to AWS D1.2 welding code. See 1.02 C.
 - 2. The gate frames shall be fabricated from 6000 Series aluminum alloy extrusions. The primary members (top and bottom) shall be "P" shaped in cross section with no less than 2" on a side and weighing not less than 1.6 lb/lf. The vertical members at the ends of each panel section shall be 2"x2" in cross section weighing not less than 1.1 lb/ft. Intermediate vertical members shall alternate between 1"x2" and 1"x1" in cross section weighing not less than 0.82 lb/lf and 0.52 lb/lf, respectively. They shall be spaced at a distance not to exceed the overall height of the box frame. The gate shall be constructed in "box" form with the width between the frames measuring 24" from outside to outside. Between these frames there shall be a continuous series of 1"x1" diagonal and horizontal bracing with the diagonals welded at approximately 45 degrees to the frames.
 - 3. Box Frame trolley assemblies shall be bolted to the box frame at intervals as specified on the bid drawings. Each assembly shall consist of a galvanized steel carriage to which two (2) wheel assemblies are secured. Each wheel shall be rated for a minimum load capacity of 2,000 lb.
 - 4. Safety guides of 3/8" x 3" galvanized steel bar with attached guide wheels shall be provided at a maximum of 10'-0" on center along the entire gate length.
 - 5. Wheel assemblies shall be covered by a single 11 gauge galvanized steel cover at each location.
- B. Gate Track:**
 - 1. The gate shall roll on two parallel tracks, which are embedded in concrete so that the top of the track is level with the ground surface. The track shall consist of two (2) parallel W4 x 13 A36 steel beams (may be provided by others). The tracks shall

be hot dipped galvanized and set so as to vary no more than 1/4" in width between tracks with the maximum width as shown in the bid drawings (i.e.: +/- 1/8" for each track).

C. Diagonal Bracing:

1. Diagonal "X" bracing of 3/16" or 1/4" diameter stainless or galvanized steel cable shall be installed throughout the gate to brace the gate panels and to provide a ready means for vertical adjustment.

D. Gate Filler:

1. Ornamental Picket: Picket sizes shall be 1" square. Pickets may extend through only the clear opening portion or through the entire length of the gate as required. If a motorized gate operator is to be applied to the gate and the specified picket spacing allows for openings in the gate frame that exceed 2 1/4" (57mm), a secondary gate filler shall be secured at each end of the gate frame and tied at each 2" x 2" (51mm x 51mm) vertical member. The secondary gate filler shall extend to a minimum height of 72" (1.2m) above grade and shall be sized to prevent a 2 1/4" (57mm) diameter sphere from passing through openings anywhere along the length of the gate frame, and in that portion of the adjacent fence that the gate covers in the open position.

E. Finish:

1. Gate to be mill finish aluminum or color coated with polyester powder as specified. If powder coated, the gate (including track member) and all accessories shall be pretreated chemically by sand blasting or other acceptable method to ensure proper coating adherence. Gate posts (to be supplied by others) shall be galvanized or coated as specified by the design team.

F. Gate Lock:

1. (Optional) Gate system shall be furnished with an electro-mechanical lock. Lock shall be supplied with status indication and with a six tumbler mechanical lock. All gates shall be keyed alike. Lock requires additional 115V power supplied by others.

PART 3 - EXECUTION:

3.01 SITE INSPECTION:

- A. Final grades and installation conditions shall be examined. Installation shall not begin until all unsatisfactory conditions are corrected.
- B. Locate concrete mounting pad in accordance with approved shop drawings.
- C. Make sure that gate is level and operating smoothly under manual conditions before installation of gate operators. Do not proceed until gate panel is aligned and operates without binding.

3.02 INSTALLATION:

- A. Equipment in this section shall be installed in strict accordance with the company's printed instructions unless otherwise shown on the contract drawings.
- B. The gate and installation shall conform to:
 1. ASTM F 2200 standard specification for automated vehicular gate construction.

2. UL 325 standards.
- C. Installer shall ensure that the electrical service to the operator is at least 20A for 3 phase and 30A for 1 phase. Electrical wiring to conform to NEC and manufacturer's installation instructions.
- D. The installing contractor shall be responsible to ensure that appropriate external primary entrapment safety devices be installed for the specific site conditions to protect against all potential entrapment zones. Proper operation of these safety devices shall be verified and training as to the operation and maintenance of these devices for the users and owners shall be documented.

3.03 SYSTEM VALIDATION:

- A. The complete system shall be adjusted to assure it is performing properly. Test gate operator through a minimum of ten full cycles and adjust to ensure operation without binding, scraping or uneven motion. Test limit switches for proper "at rest" gate position.
- B. All anchor bolts shall be fully concealed in the finished installation.
- C. For operated gate systems - test and explain safety features:
 1. Each system feature and device is a separate component of the gate system.
 2. Read and follow all instructions for each component.
 3. Ensure that all instructions for mechanical components, safety devices and the gate operator are available for everyone who will be using the gate system.
 4. The warning signs shipped with the gate operator must be installed in prominent position on both sides of the gate.
- D. Ensure the owner is clear with regard to the safety points concerning the basic operational guidelines of the safety features of the gate operator system. These safety points are listed in the gate operator manual and must be read prior to system use.

Note: Tymetal Corp. reserves the right to modify and/or make changes as deemed necessary without previous notice.

SECTION 33 11 00
WATER DISTRIBUTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Provide new water lines from the existing water main to points shown on the plans. This includes, but is not limited to the following:
 - 1. Piping and fittings
 - 2. Fire hydrants
 - 3. Curb boxes and valves
 - 4. Post indicating valves, standard and electrically supervised
 - 5. Tapping sleeves and valves
 - 6. Flushing and testing
 - 7. Sterilization
 - 8. All labor, equipment, devices, materials and performing all operations necessary in connection with the combined water system as herein specified and shown, indicated or noted on the drawings and subject to the terms and conditions of the contract.

1.02 RELATED SECTIONS

- A. Section 31 23 33, "Piped Utilities - Basic Methods"

1.03 REFERENCES

- A. Construction and Materials Specifications – City of Columbus (CMSC) 2012 Edition

1.04 SUBMITTALS

- A. Submit under provisions of Division 1.
- B. Submit product data, shop drawings, catalog cuts, etc., for pipe, fire hydrants, siamese, detector checks, meters, fittings, valves and accessories.
- C. Certification from the Contractor stating that hydrostatic tests have been conducted in accordance with Specifications and in the presence of the Project Manager Engineer / Inspector and that the completed pipeline is acceptable in accordance with criteria set forth in Specifications for leakage.
- D. Certification from the Contractor stating that pipe lines constructed have been disinfected as specified and are safe for conveying potable water.
- E. Sequence of work in accordance with this Section and Division 1.

PART 2 PRODUCTS

- A. Provide products for Water Distribution in accordance with CMSC Section 800 and the details and notes on the drawings.

PART 3 EXECUTION

- A. Perform work in accordance with CMSC Section 800 and notes on drawings.

END OF SECTION

CIVIL SPECIFICATIONS INDEX

<u>Site and Infrastructure Subgroup</u>	
Division 31	Earthwork
31 00 00	Earthwork
31 23 33	Piped Utilities-Basic Methods
31 25 00	Erosion and Sediment Control
Division 32	Exterior Improvements
32 13 00	Rigid Pavement
32 30 00	Stalwart II PU30 Anti-Ram Barrier
32 31 00	TYM-HYD Box Frame Roller Gate System with Hydraulic Operator
32 31 00	Pedestrian Swing Gate
Division 33	Utilities
33 11 00	Water Distribution

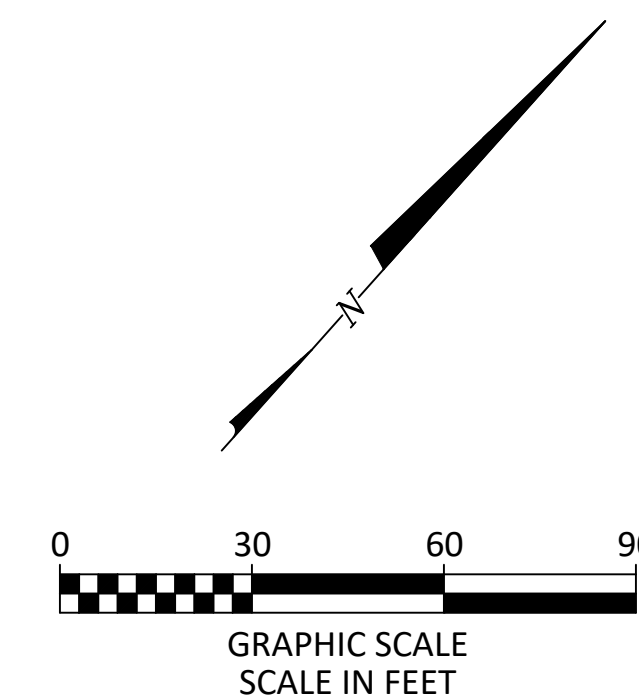
ELECTRICAL SPECIFICATIONS INDEX

<u>Specifications Group</u>	
<u>Facility Services Subgroup</u>	
Division 26	Electrical
26 00 00	Division 26 – Electrical Introductory Statement
26 00 05	Division 26 General Requirements
26 00 10	Coordination Between Trades
26 00 15	Submittals
26 00 20	Record and Information Manuals
26 00 25	Excavation, Backfill, and Protection of Utilities
26 00 30	Concrete Foundations, Supports, and Envelopes
26 00 55	Sleeves, Seals, and Firestops
26 00 70	Demolition
26 00 80	Power System Coordination Analysis
26 00 99	Requirements for Contract Completion
26 05 10	Wire and Cable
26 05 26	Grounding & Bonding (Extension)
26 05 29	Hangers and Supports
26 05 33	Conduit and Fittings
26 05 34	Outlet Boxes
26 05 35	Low Voltage Outlet Boxes
26 05 36	Pull and Junction Boxes
26 05 53	Electrical Identification
26 05 82	Underground Junction Boxes
26 08 40	Electrical Tests, Adjustments, Inspection
26 28 16	Safety Switches
26 29 13	Motor Controllers
26 60 10	Snow Melting System
Division 27	Communications
27 00 15	Submittals
27 00 20	Record and Information Manuals

27 00 70	Demolition
27 10 00	Structured Cabling

Division 28	Electronic Safety and Security
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28 00 00	Division 28 – Electronic Safety and Security Introductory Statement
28 00 15	Submittals
28 00 20	Record and Information Manuals
28 13 00	Security and Access Control System
28 15 23	Audio/Video Intercom System
28 23 00	Video Surveillance System



EXISTING
REFER TO SHEET TS1.0
PROPOSED

- | | |
|---|---|
|  | REMOVE EXISTING ASPHALT, GRAVEL, AND CONCRETE PAVEMENT, CONCRETE SIDEWALK, BUILDING FOUNDATION, AND PAVEMENT BASE MATERIALS |
|  | REMOVE EXISTING TREE |
|  | PROTECT EXISTING TREE TO REMAIN |
|  | REMOVE EXISTING CONCRETE CURB |

1. SITE SURVEY PERFORMED BY KORDA, DATED 8/25/2026. REFER TO SHEET TSL1 FOR ALL EXISTING SITE FEATURES.
2. DISPOSE OF CONSTRUCTION DEBRIS OFF-SITE IN ACCORDANCE WITH LOCAL CODES.
3. REMOVE AND DISPOSE OF ON SITE FEATURES AS SHOWN ON THE PLAN.
4. SAW-CUT EXISTING PAVEMENT AT STRAIGHT LINES. PAVEMENT REMOVAL TO FULL DEPTH USING CARE TO CUT NEAT, STRAIGHT LINES. CUT AT EXISTING JOINTS, IF AVAILABLE.
5. CONTRACTOR TO PROTECT EXISTING SITE FEATURES TO REMAIN OUTSIDE CONSTRUCTION LIMITS. REPAIR ANY DAMAGE TO THE SATISFACTION OF THE OWNER. NO ADDITIONAL COSTS TO BE INCURRED BY THE OWNER.
6. CONTROL DUST AT THE SITE. PROVIDE STREET CLEANING WHEN NECESSARY, AND WHEN REQUESTED BY OWNER.
7. GRADE SITE DURING CONSTRUCTION TO PROVIDE POSITIVE DRAINAGE TO EXISTING DRAINAGE OR PROVIDE TO NEW DRAINAGE WATER MANAGEMENT SYSTEM.
8. PERFORM WORK IN ACCORDANCE WITH LOCAL CODES AND REGULATIONS.

1. PROTECT EXISTING PAVEMENT/SIDEWALK TO REMAIN.
2. PROTECT EXISTING CONCRETE CURB OR CURB AND GUTTER TO REMAIN.
3. SAWCUT EXISTING PAVEMENT WITH NEAT, STRAIGHT LINES. MATCH EXISTING PAVEMENT GRADE AT THIS POINT.
4. PROTECT EXISTING UTILITY STRUCTURE TO REMAIN. ADJUST TO FINAL GRADE.
5. REMOVE EXISTING GUARDRAIL.
6. REMOVE EXISTING SWING GATE.
7. REMOVE EXISTING GUARD SHACK.
8. REMOVE AND STORE BARRIERS TO BE REINSTALLED AFTER CONSTRUCTION.
9. WATER SERVICE VALVES TO BE RELOCATED. REFER TO SHEET C3.1 FOR DETAILS.
10. REMOVE EXISTING BOLLARD.
11. REMOVE AND REINSTALL SIGN.
12. REMOVE AND REINSTALL LIGHT POST. ADJUST TO GRADE.
13. TREE TO BE REPLANT IN KIND.

No.	Description	Date

GREATER COLUMBUS CONVENTION CENTER
SITE SECURITY IMPROVEMENTS
BID DOCUMENTS



DEMOLITION PLAN

KORDA

KORDA: NEMETH ENGINEERING

WWW.KORDA.COM

DRAWN BY: KATIE VATKE

DESIGNED BY: KATIE VATKE

CHECKED BY: GRAHAM WATKINS

PROJECT NUMBER: 2026-0416

DEMOLITION PLAN

PROJECT NUMBER: 2026-0416

DRAWN BY: KEV

DESIGNED BY: KEV

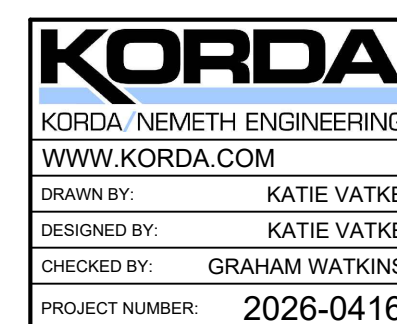
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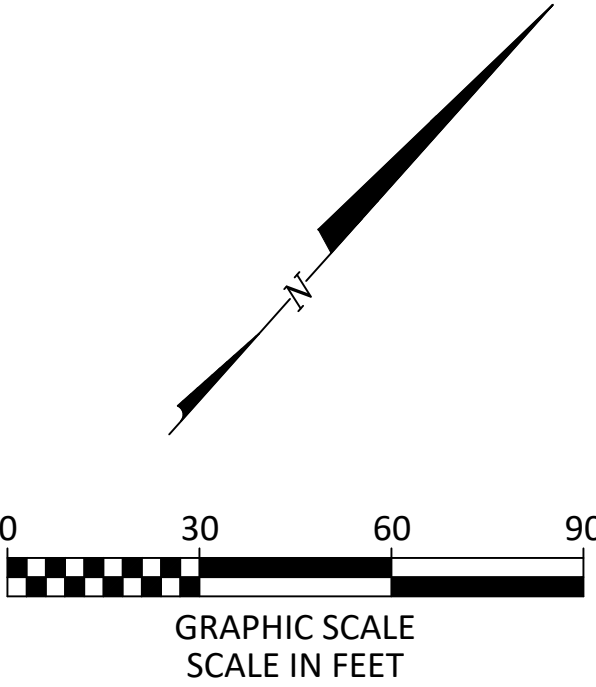
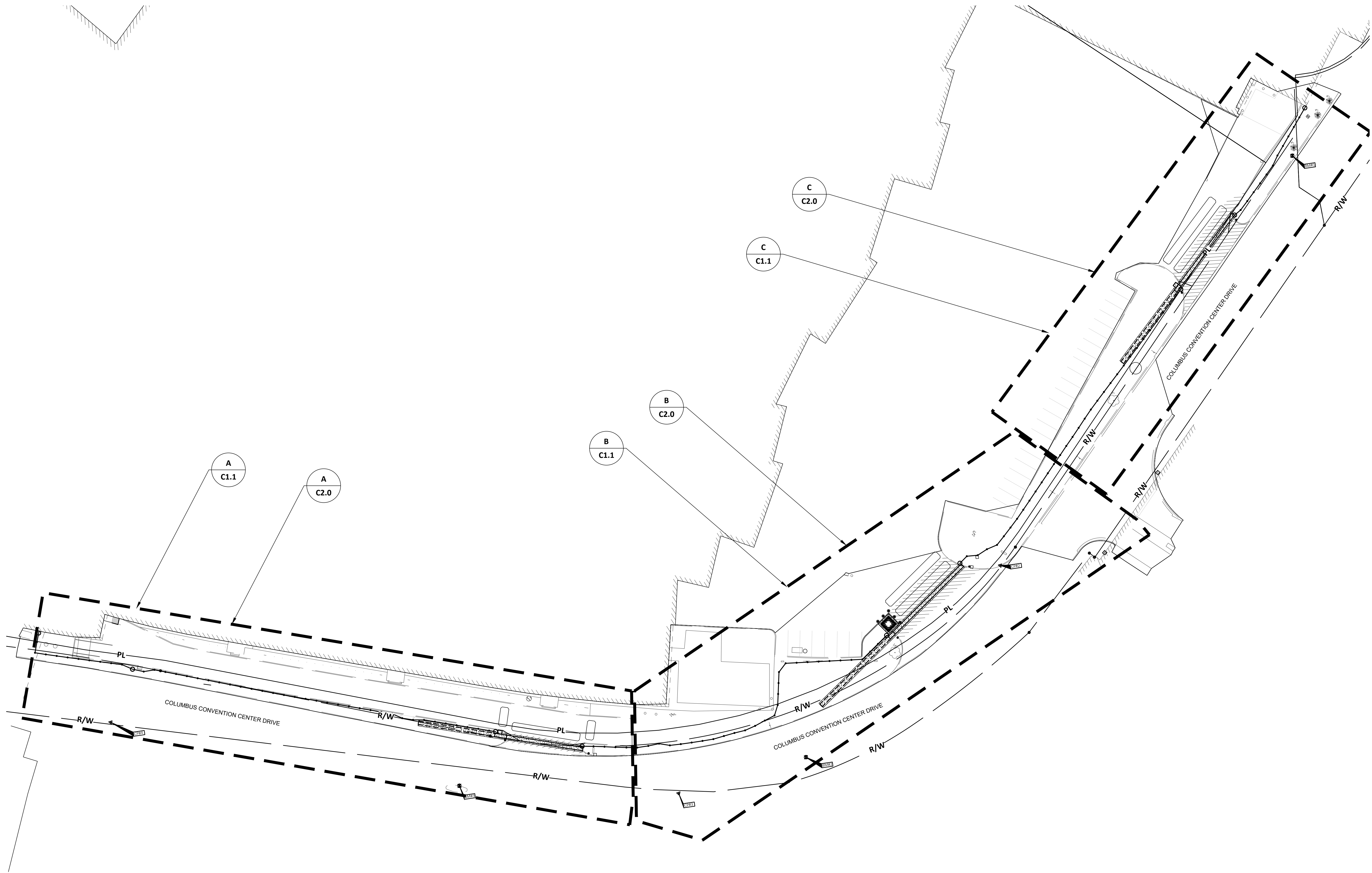
DATE

09/25/2026

SHEET NUMBER

C0.0





STAKING LEGEND

- EXISTING**
REFER TO SHEET TS1.0
- PROPOSED**
- BUILDING/WALL
 - STRAIGHT CURB PER DETAIL C/C1.3
 - PAVEMENT
 - BOLLARD PER DETAIL A/C1.2
 - FENCE & POSTS PER DETAIL D/C1.2
 - CONCRETE GATE TRACK
 - REGRADED PAVEMENT TO BE REPLACED IN KIND

GENERAL NOTES:

- DIMENSIONS AND COORDINATES ARE GIVEN TO FACE OF CURB AND FACE OF BUILDING UNLESS OTHERWISE NOTED.
- BUILDING COORDINATES PROVIDED FOR GENERAL LOCATION AND ORIENTATION ONLY. REFER TO ARCHITECTURAL PLANS FOR BUILDING LAYOUT.
- CURB AND SIDEWALK RADI SHALL BE 5'-0" UNLESS OTHERWISE NOTED.
- PROVIDE STRIPING AND SYMBOLS AS SHOWN PER ODOT ITEM 641 AND 642. PROVIDE STRIPING PAINT WITH GLASS BEADS. PROVIDE TYPE I OR TYPE IA PAINT IN ACCORDANCE WITH ODOT ITEM 642 DEPENDING ON TEMPERATURE CONDITIONS AT THE TIME OF APPLICATION. TYPICAL LINE WIDTH SHALL BE 4 INCHES, COLOR WHITE. PROVIDE TWO COATS.
- STANDARD PARKING STALL DIMENSIONS ARE 9'-0" IN WIDTH BY 18'-0" IN LENGTH UNLESS OTHERWISE NOTED.
- SAWCUT FULL DEPTH SIDEWALK AND PAVEMENT WHERE NEW WORK ABUTS EXISTING CONSTRUCTION. TAKE CARE TO PROVIDE NEAT STRAIGHT LINES. PROVIDE PAVEMENT SEALANT PER ODOT ITEM 705.04 AT JOINT BETWEEN EXISTING AND NEW ASPHALT. REMOVE CONCRETE TO NEAREST JOINT. PROVIDE 1/2" PREFORMED EXPANSION JOINT FILLER BETWEEN NEW AND EXISTING CONSTRUCTION.
- ANY PROPERTY PINS DAMAGED AS PART OF CONSTRUCTION SHALL BE RESET BY AN OHIO REGISTERED SURVEYOR.
- MAINTAIN PEDESTRIAN AND VEHICULAR ACCESS TO ADJACENT BUILDINGS AT ALL TIMES DURING CONSTRUCTION.
- REFER TO ARCHITECTURAL DRAWINGS FOR ALL SITE SIGNAGE NOT SHOWN ON THIS SHEET.
- PROVIDE CONTROL JOINTS PER DETAIL B/C1.2. PROVIDE ISOLATION JOINTS WHERE NEW CONCRETE ABUTS EXISTING STRUCTURES PER DETAIL C/C1.2 AND PER SPECIFICATIONS.
- FINAL FENCE AND FENCE POST LAYOUT TO BE APPROVED BY ENGINEER.
- ALL GATES TO BE CONTROLLABLE FROM GUARD SHACK. COORDINATE FINAL GATE OPERATIONS WITH OWNER.

No.	Description	Date

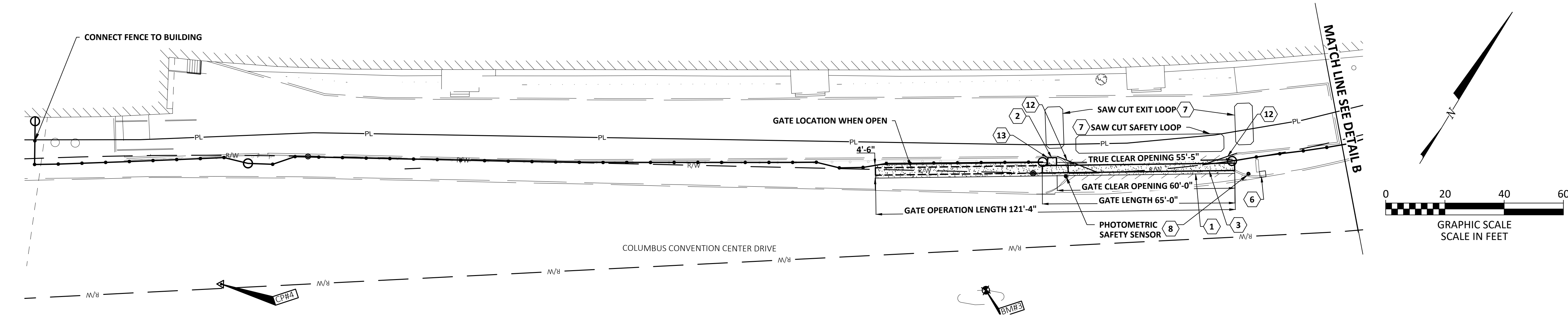
GREATER COLUMBUS CONVENTION CENTER
SITE SECURITY IMPROVEMENTS
BID DOCUMENTS

KORDA Korda/Nemeth Engineering, Inc. - Consulting Engineers
1650 Watermark Drive, Suite 200 - Columbus, Ohio 43215-7010
TEL 614-487-1650 - WEB www.korda.com

STAKING PLAN

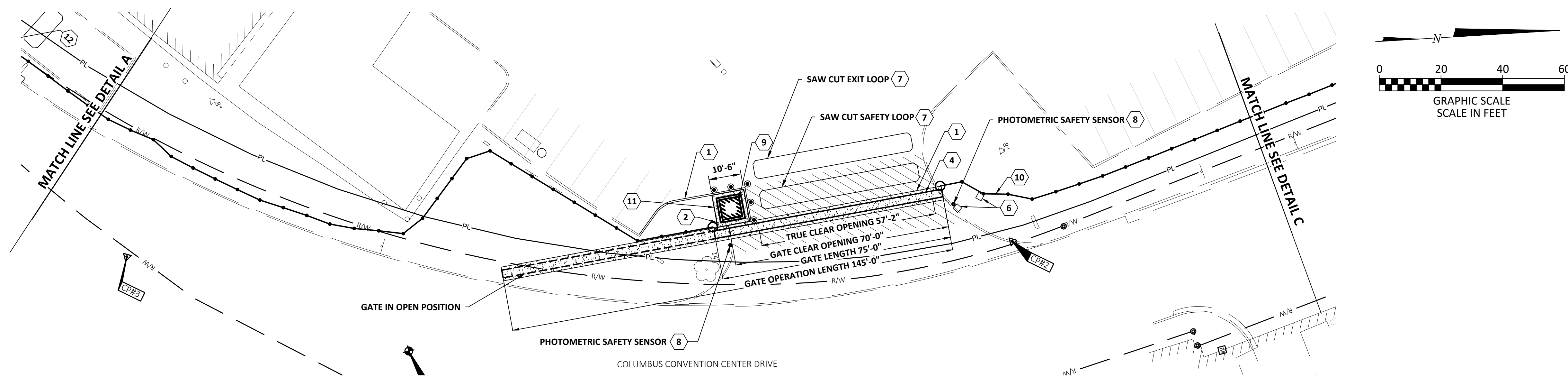
KORDA
KORDA NEMETH ENGINEERING
WWW.KORDA.COM
DRAWN BY: KATIE VATKE
DESIGNED BY: KATIE VATKE
CHECKED BY: GRAHAM WATKINS
PROJECT NUMBER: 2026-0416

PROJECT NUMBER:	2026-0416		
DRAWN BY:	KEV	DATE	SHEET NUMBER
DESIGNED BY:	KEV	09/25/2026	C1.0
CHECKED BY:	GJW		



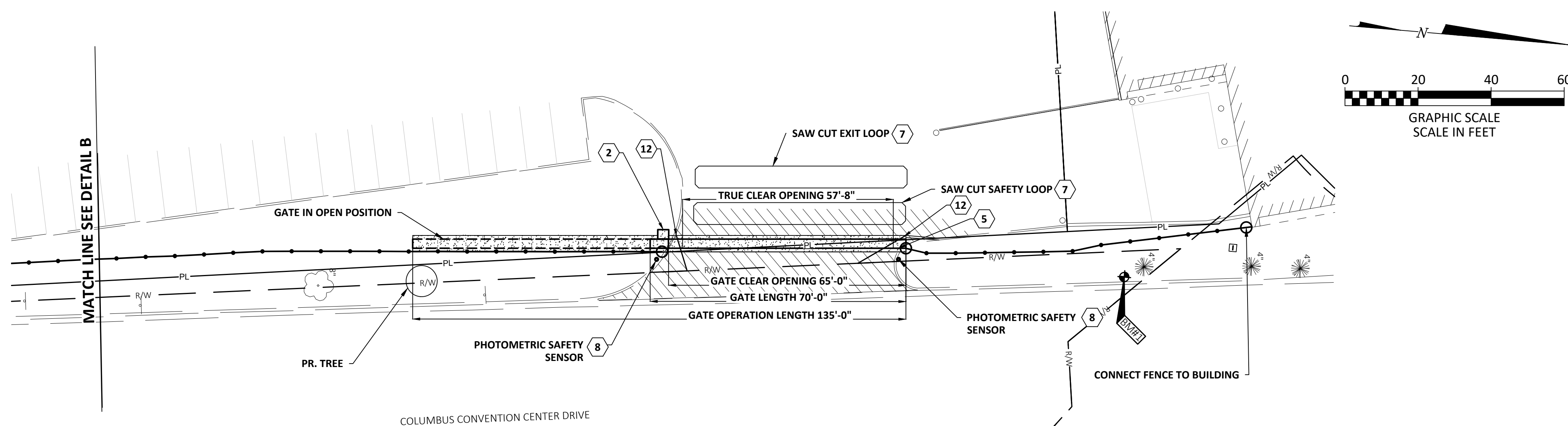
A **DETAIL**
SOUTHERN GATE STAKING PLAN

1"=20'



B **DETAIL**
MIDDLE ENTRANCE GATE STAKING PLAN

1"=20'



C **DETAIL**
NORTHERN EXIT GATE STAKING PLAN

1"=20'

STAKING LEGEND

EXISTING

REFER TO SHEET TS1.0

PROPOSED

- BUILDING/WALL
- STRAIGHT CURB PER DETAIL C/C1.3
- PAVEMENT
- BOLLARD PER DETAIL A/C1.2
- FENCE & POSTS PER DETAIL D/C1.2
- CONCRETE GATE TRACK WITH HEATED COIL PER DETAIL F/C1.2
- REGRADED PAVEMENT TO BE REPLACED IN KIND

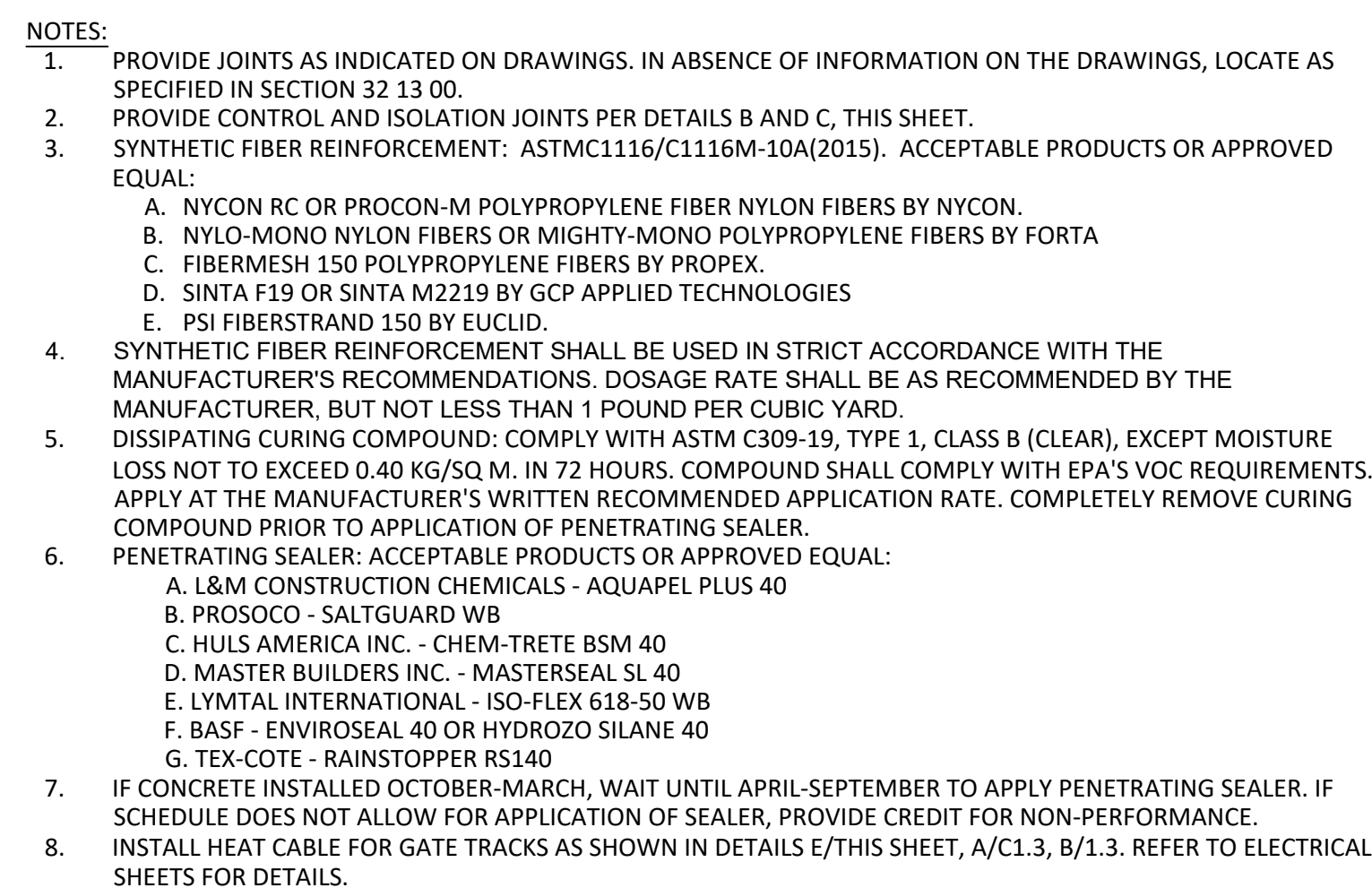
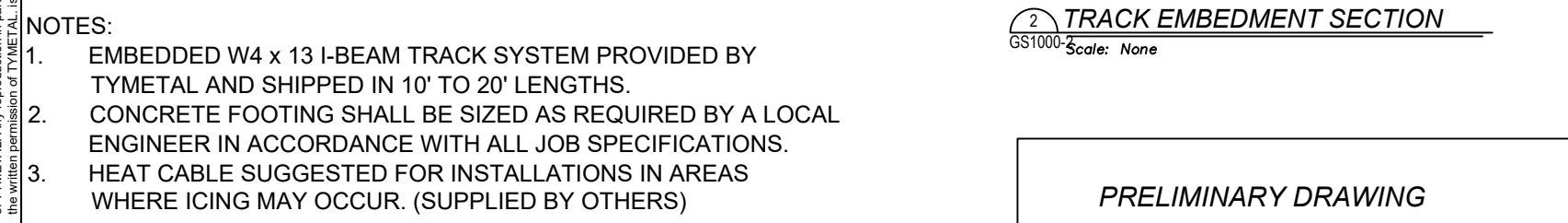
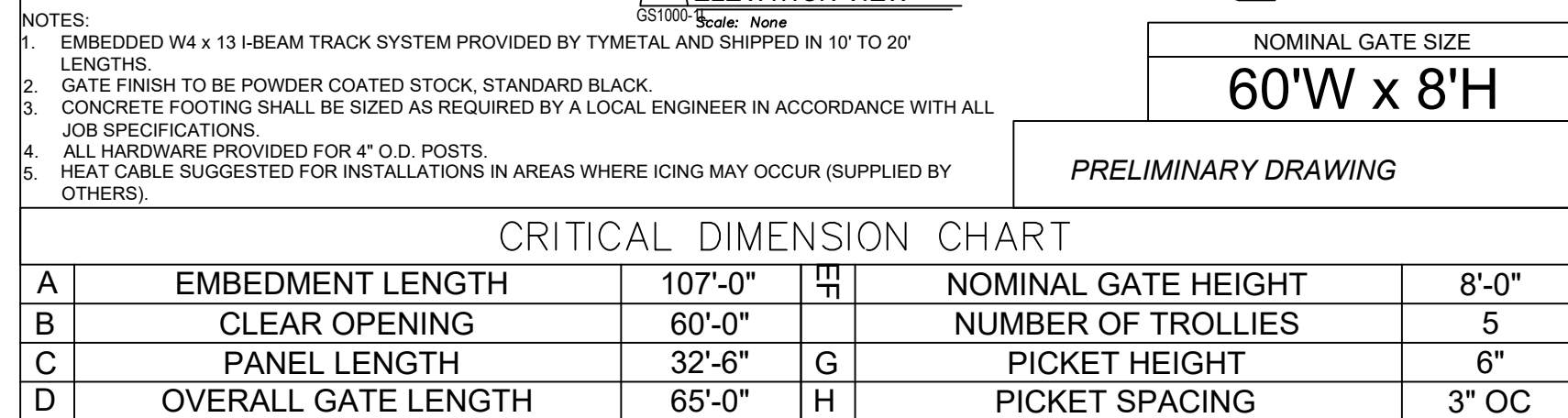
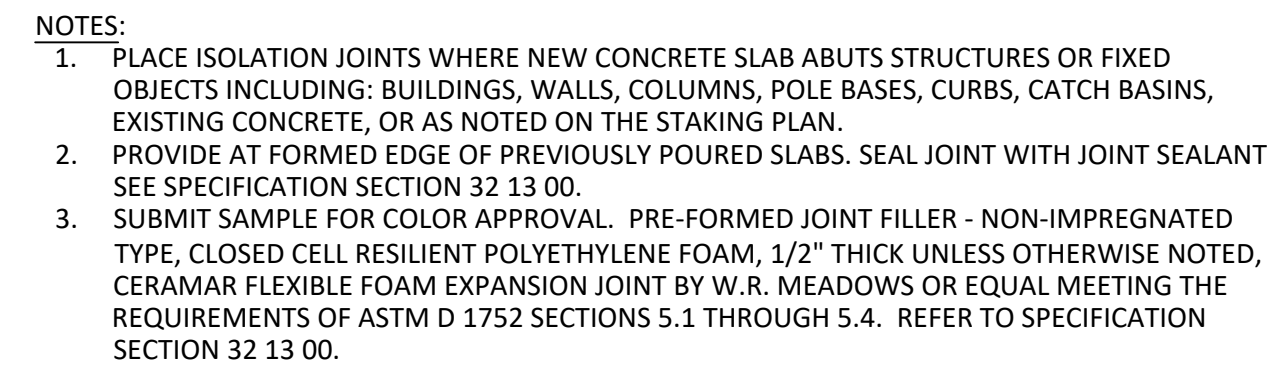
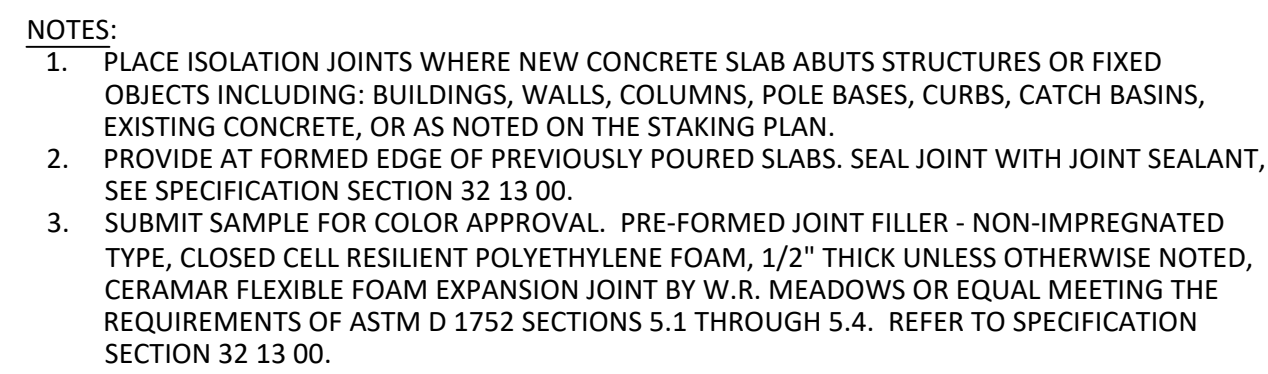
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- CURB AND SIDEWALK RADII SHALL BE 5'-0" UNLESS OTHERWISE NOTED.
- PROVIDE STRIPING AND SYMBOLS AS SHOWN PER ODOT ITEM 641 AND 642. PROVIDE STRIPING PAINT WITH GLASS BEADS. PROVIDE TYPE I OR TYPE IA PAINT IN ACCORDANCE WITH ODOT ITEM 642 DEPENDING ON TEMPERATURE CONDITIONS AT THE TIME OF APPLICATION. TYPICAL LINE WIDTH SHALL BE 4 INCHES, COLOR WHITE. PROVIDE TWO COATS.
- STANDARD PARKING STALL DIMENSIONS ARE 9'-0" IN WIDTH BY 18'-0" IN LENGTH UNLESS OTHERWISE NOTED.
- SAWCUT FULL DEPTH SIDEWALK AND PAVEMENT WHERE NEW WORK ABUTS EXISTING CONSTRUCTION. TAKE CARE TO PROVIDE NEAT STRAIGHT LINES. PROVIDE PAVEMENT SEALANT PER ODOT ITEM 705.04 AT JOINT BETWEEN EXISTING AND NEW ASPHALT. REMOVE CONCRETE TO NEAREST JOINT. PROVIDE 1/2" PREFORMED EXPANSION JOINT FILLER BETWEEN NEW AND EXISTING CONSTRUCTION.
- ANY PROPERTY PINS DAMAGED AS PART OF CONSTRUCTION SHALL BE RESET BY AN OHIO REGISTERED SURVEYOR.
- MAINTAIN PEDESTRIAN AND VEHICULAR ACCESS TO ADJACENT BUILDINGS AT ALL TIMES DURING CONSTRUCTION.
- REFER TO ARCHITECTURAL DRAWINGS FOR ALL SITE SIGNAGE NOT SHOWN ON THIS SHEET.
- PROVIDE CONTROL JOINTS PER DETAIL B/C1.2. PROVIDE ISOLATION JOINTS WHERE NEW CONCRETE ABUTS EXISTING STRUCTURES PER DETAIL C/C1.2 AND PER SPECIFICATIONS.
- FINAL FENCE AND FENCE POST LAYOUT TO BE APPROVED BY ENGINEER.
- ALL GATES TO BE CONTROLLABLE FROM GUARD SHACK. COORDINATE FINAL GATE OPERATIONS WITH OWNER.

(X) CODED NOTES:

- SAW-CUT EXISTING PAVEMENT WITH NEAT, STRAIGHT LINES. MATCH EXISTING PAVEMENT GRADE AT THIS POINT.
- TYM-HYD GATE OPERATOR PAD.
- BOX FRAME ROLLER GATE PER DETAIL E/C1.2
- BOX FRAME ROLLER GATE PER DETAIL A/C1.3
- BOX FRAME ROLLER GATE PER DETAIL B/C1.3
- PROVIDE CARD READER AND KNOX BOX ACCESS MOUNTED TO PEDESTAL. PROVIDE CONDUIT FOR POWER/CONTROLS BACK TO GUARD SHACK.
- DETECTION LOOP. PROVIDE CONDUIT FROM DETECTION LOOP TO MOTORIZED GATE CONTROL COORDINATE WITH EQUIPMENT IN FIELD PRIOR TO ROUGH-IN.
- PHOTOMETRIC SENSOR. PROVIDE CONDUIT FROM SENSOR TO MOTORIZED GATE CONTROL COORDINATE WITH EQUIPMENT IN FIELD PRIOR TO ROUGH-IN.
- PROPOSED GUARD SHACK. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS.
- INSTALL TYMETAL 2150 STYLE A PRE-HUNG PEDESTRIAN SWING GATE MAN DOOR COMPATIBLE WITH 8FT STALWART II FENCE PER DETAIL E/C1.3. REFER TO ELECTRICAL PLANS FOR CARD ACCESS DETAILS.
- 4" CONCRETE AROUND GUARD SHACK PER DETAIL D/C1.3.
- RIGHT OF WAY PAVEMENT STRIPING.
- PROGRAM GATE TO OPEN TO TRUE CLEAR OPENING.

No.	Description	Date
GREATER COLUMBUS CONVENTION CENTER SITE SECURITY IMPROVEMENTS BID DOCUMENTS		
KORDA Korda/Nemeth Engineering, Inc. - Consulting Engineers 1650 Watermark Drive, Suite 200 - Columbus, Ohio 43215-7010 TEL 614-487-1650 - WEB www.korda.com		
STAKING PLAN		
PROJECT NUMBER: 2026-0416		
DRAWN BY: KATIE VATKE	KEY	DATE
DESIGNED BY: KATIE VATKE	KEY	SHEET NUMBER
CHECKED BY: GRAHAM WATKINS	KEY	09/25/2026
PROJECT NUMBER: 2026-0416	CHECKED BY: GJW	C1.1



No.	Description	Date			
GREATER COLUMBUS CONVENTION CENTER SITE SECURITY IMPROVEMENTS					
BID DOCUMENTS					
 Korda/Nemeth Engineering, Inc. - Consulting Engineer 1650 Watermark Drive, Suite 200 - Columbus, Ohio 43215-7000 TEL 614-487-1650 WEB www.korda.com					
STAKING DETAILS					
PROJECT NUMBER:			2026-0411		
DRAWN BY:	KEV	DATE	SHEET NUMBER		
DESIGNED BY:	KEV	09/25/2026	C1.2		
CHECKED BY:	GJW				

KORDA	
KORDA / NEMETH ENGINEERING	
WWW.KORDA.COM	
DRAWN BY:	KATIE VATKE
DESIGNED BY:	KATIE VATKE
CHECKED BY:	GRAHAM WATKINS
PROJECT NUMBER:	2026-0416



NTS



NTS



N.T.S.



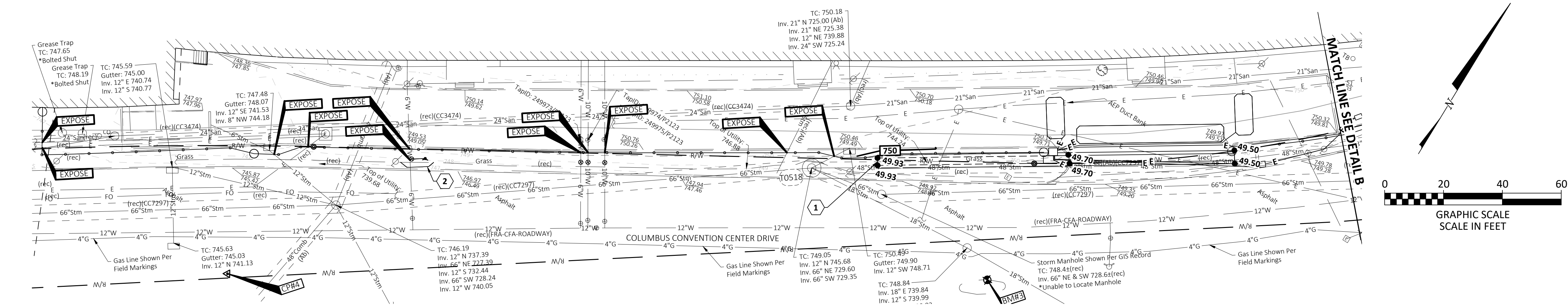
N.T.S



N.T.S.

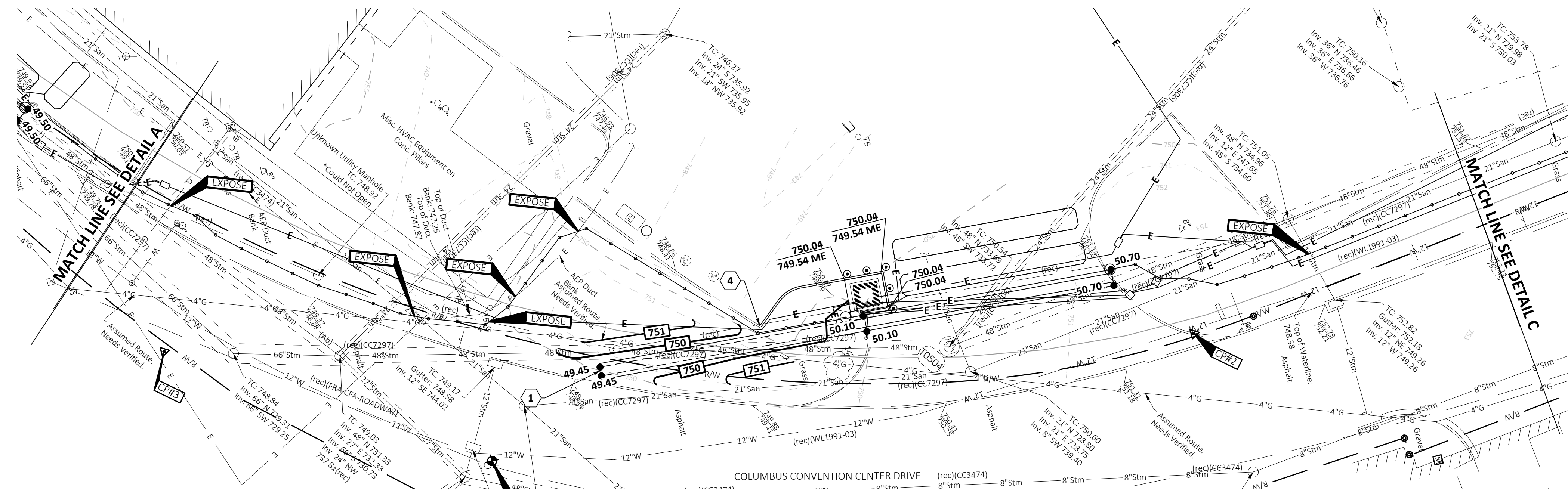
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STAKING DETAILS



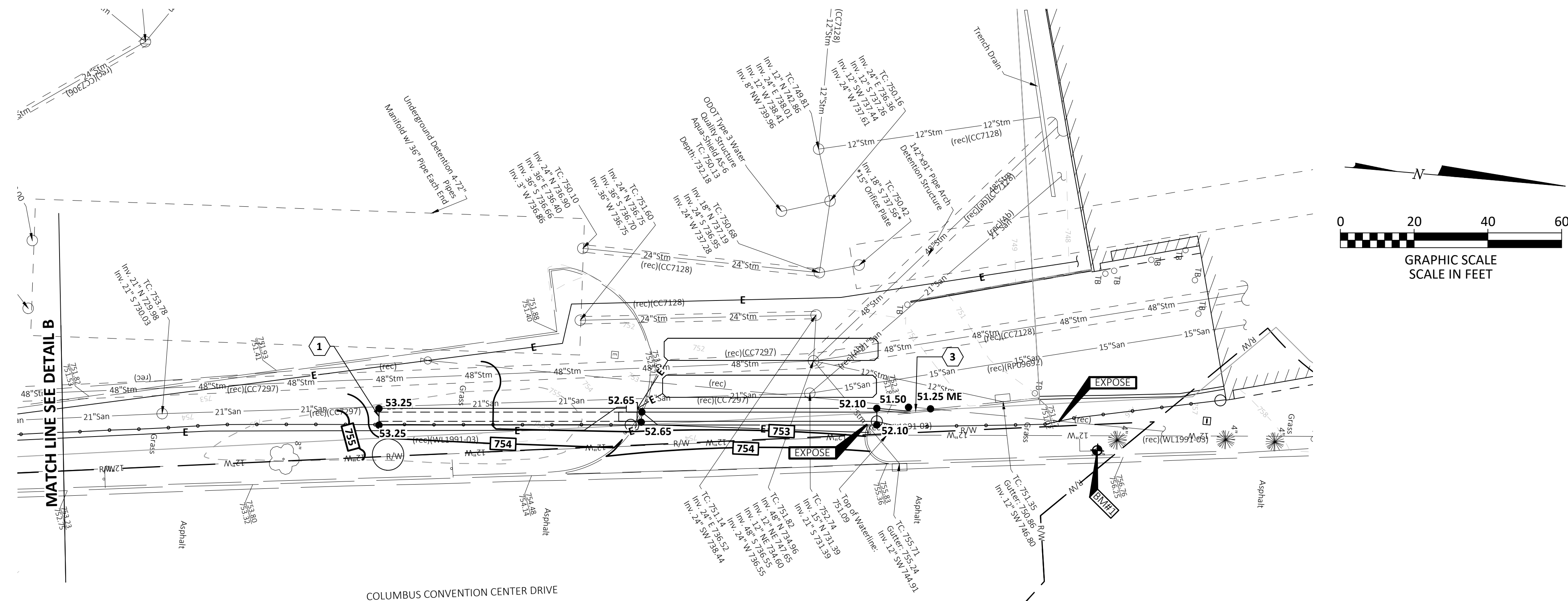
A **DETAIL**
SOUTHERN GATE GRADING PLAN

1"=20'



B **DETAIL**
MIDDLE ENTRANCE GATE GRADING PLAN

1"=20'



C **DETAIL**
NORTHERN EXIT GATE GRADING PLAN

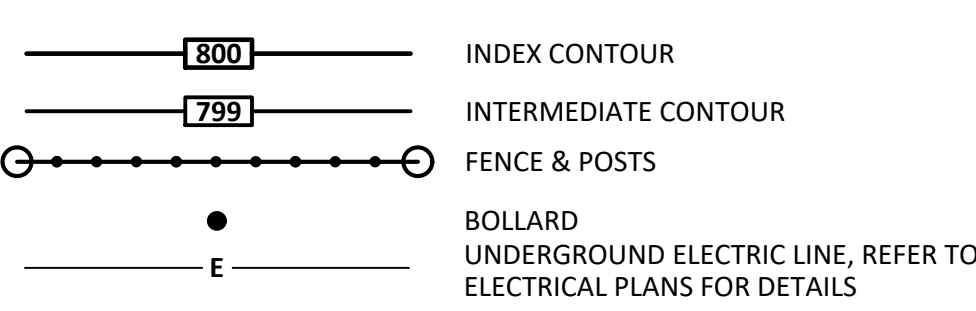
1"=20'

GRADING LEGEND

EXISTING

REFER TO SHEET TS1.0

PROPOSED



GENERAL NOTES:

1. PAVEMENT ELEVATIONS REFER TO FINISHED PAVEMENT ELEVATION AT FACE OF CURB UNLESS OTHERWISE NOTED.
2. ADD 700 TO SPOT ELEVATIONS TO OBTAIN U.S.G.S. ELEVATIONS.
3. CONSTRUCTION WORK WILL NOT BE PERMITTED WITHOUT APPROVED PLANS AND INSPECTION.
4. PERFORM WORK IN ACCORDANCE WITH CITY OF COLUMBUS MATERIAL SPECIFICATIONS AND STANDARD CONSTRUCTION DRAWINGS. IN CASE OF A DISCREPANCY BETWEEN CITY OF COLUMBUS REQUIREMENTS AND PROJECT SPECIFICATIONS, CITY OF COLUMBUS STANDARDS SHALL GOVERN.
5. SOIL EROSION AND SEDIMENTATION BMP MEASURES, PER SHEET C2.1, SHALL BE INSTALLED PRIOR TO START OF ANY CONSTRUCTION AND SHALL BE MAINTAINED UNTIL CONSTRUCTION HAS BEEN COMPLETED, INCLUDING GRASS BEING WELL ESTABLISHED AND/OR PERMANENT EROSION AND SEDIMENTATION BMP MEASURES IN PLACE. BMP MEASURES SHALL BE TO THE SATISFACTION OF THE CITY OF COLUMBUS.
6. STREET CLEANING (ON AN AS-NEEDED BASIS) IS REQUIRED THROUGHOUT THE DURATION OF THIS CONSTRUCTION PROJECT. THIS INCLUDES SWEEPING, POWER CLEANING, AND (IF NECESSARY) MANUAL REMOVAL OF DIRT AND/OR MUD IN THE STREET GUTTERS.
7. REMOVE SEDIMENT FROM DETENTION AREAS, OUTLET STRUCTURES, AND UNDERDRAINS ONCE FINAL SEED HAS BEEN ESTABLISHED.
8. ANY EXISTING STORM INLETS IMPACTED BY THE NEW CONSTRUCTION ACTIVITY WILL NEED THE APPROPRIATE INLET PROTECTION FOR SEDIMENT CONTROL.
9. DIMENSIONS AND COORDINATES ARE TO FACE OF CURB OR FACE OF BUILDING UNLESS OTHERWISE NOTED.
10. MAXIMUM FINISH SLOPES SHALL BE 4:1 UNLESS OTHERWISE NOTED.
11. COORDINATES AND ELEVATIONS BASED ON SURVEY PERFORMED BY KORDA, DATED 05/28/2026. REFER TO SHEET TS1.0.
12. CONTRACTOR SHALL STRIP AND STOCKPILE EXISTING TOPSOIL THROUGHOUT THE SITE PRIOR TO EXCAVATION. UPON COMPLETION OF FINAL GRADING, PROVIDE 6 INCHES OF TOPSOIL AND SEED AREAS DISTURBED BY CONSTRUCTION, INCLUDING LAYDOWN AREAS AND TRAILER LOCATIONS IF LOCATED OUTSIDE THE GRADING/SEEDING LIMITS.
13. DISPOSE EXCESS EXCAVATED MATERIALS AND UNACCEPTABLE/UNSUITABLE SOILS OFF SITE IN ACCORDANCE WITH LOCAL CODES. NO PERMANENT STOCKPILES WILL REMAIN ON SITE.
14. EXISTING VALVES, MANHOLES, AND OTHER APPURTENANCES TO REMAIN LOCATED WITHIN THE WORK LIMITS SHALL BE ADJUSTED TO FINISH GRADE.
15. OUTLET CURB UNDERDRAINS TO ADJACENT EXISTING UNDERDRAINS OR STORM SEWER SYSTEM.
16. EXPOSE UTILITIES NOTED THUS: **EXPOSE** PRIOR TO BEGINNING WORK ON THAT UTILITY TO DETERMINE EFFECTS ON THE PROPOSED ALIGNMENT AND PROFILE. REPORT ELEVATION AND LOCATION TO THE ENGINEER IN ORDER THAT ANY CORRECTIONS TO THE ELEVATION AND LOCATION CAN BE MADE.
17. CONCRETE ADJACENT TO BUILDING SHALL BE SLOPED AWAY FROM BUILDING AT 2.0% UNLESS OTHERWISE NOTED.
18. ROOF DRAINS, FOUNDATION DRAINS, AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER ARE PROHIBITED.

CODED NOTES:

1. TRANSITION GRADE FROM CONCRETE BACK TO EXISTING AT A 3:1 SLOPE.
2. RERUN STREET LIGHTING CONDUIT AROUND HYDRANT.
3. TAPER FROM FULL HEIGHT CURB TO FLUSH CURB.
4. MATCH EXISTING CURB GRADE.

No.	Description	Date

GREATER COLUMBUS CONVENTION CENTER
SITE SECURITY IMPROVEMENTS
BID DOCUMENTS

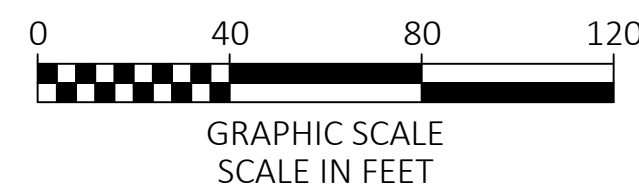
KORDA Korda/Nemeth Engineering, Inc. Consulting Engineers
1650 Watermark Drive, Suite 200 • Columbus, Ohio 43215-7010
TEL 614-487-1650 • WEB www.korda.com

GRADING PLAN

KORDA
KORDA NEMETH ENGINEERING

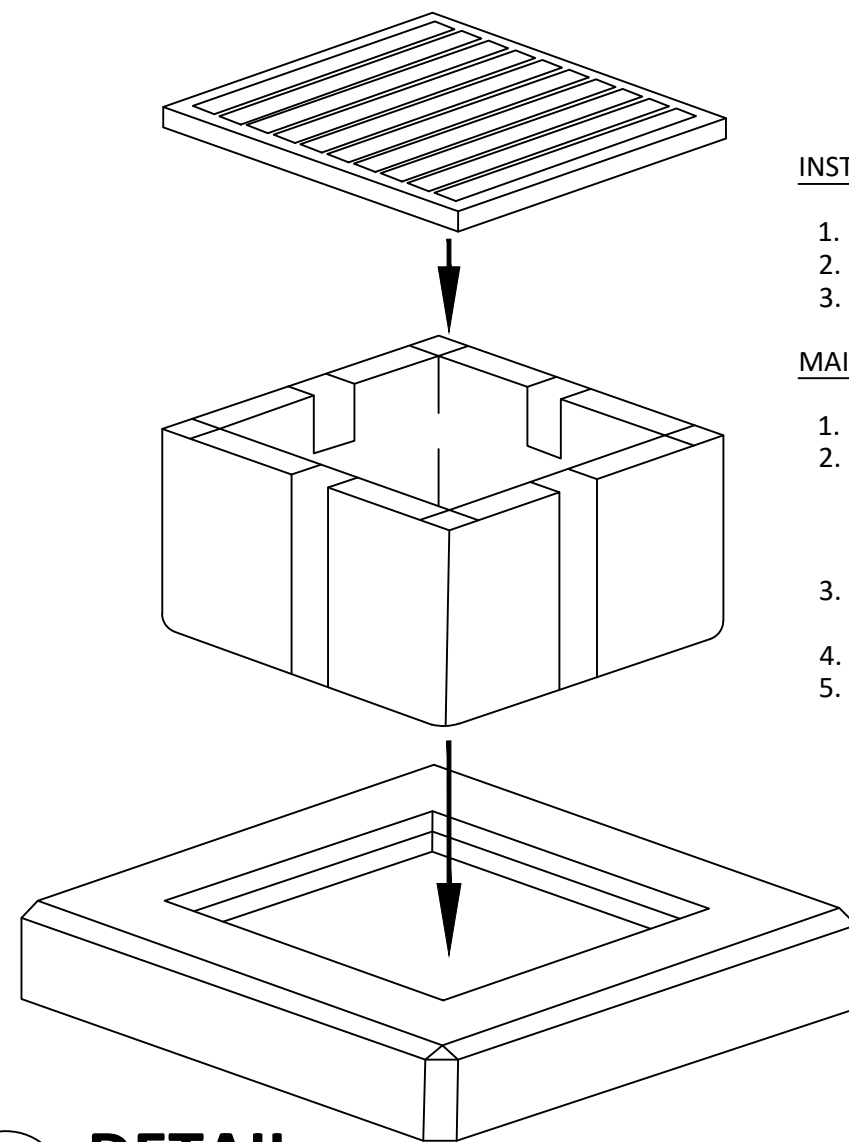
WWW.KORDA.COM
DRAWN BY: KATIE VATKE
DESIGNED BY: KATIE VATKE
CHECKED BY: GRAHAM WATKINS
PROJECT NUMBER: 2026-0416

PROJECT NUMBER:		2026-0416	
DRAWN BY:	KEV	DATE	SHEET NUMBER
DESIGNED BY:	KEV	09/25/2026	C2.0
CHECKED BY:	GJW		

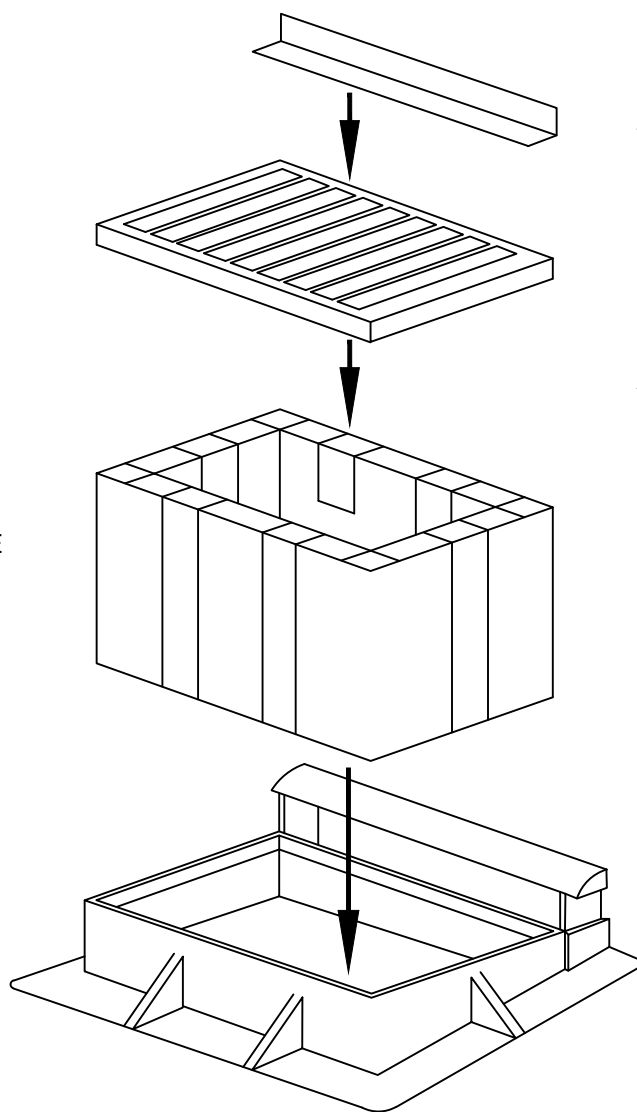


EROSION AND SEDIMENT CONTROL LEGEND

- EXISTING**
REFER TO SHEET TS1.0
- PROPOSED**
- INDEX CONTOUR
 - INTERMEDIATE CONTOUR
 - BUILDING/WALL
 - INLET FILTER PER DETAIL A/THIS SHEET
 - CONCRETE WASHOUT PER DETAIL B/THIS SHEET



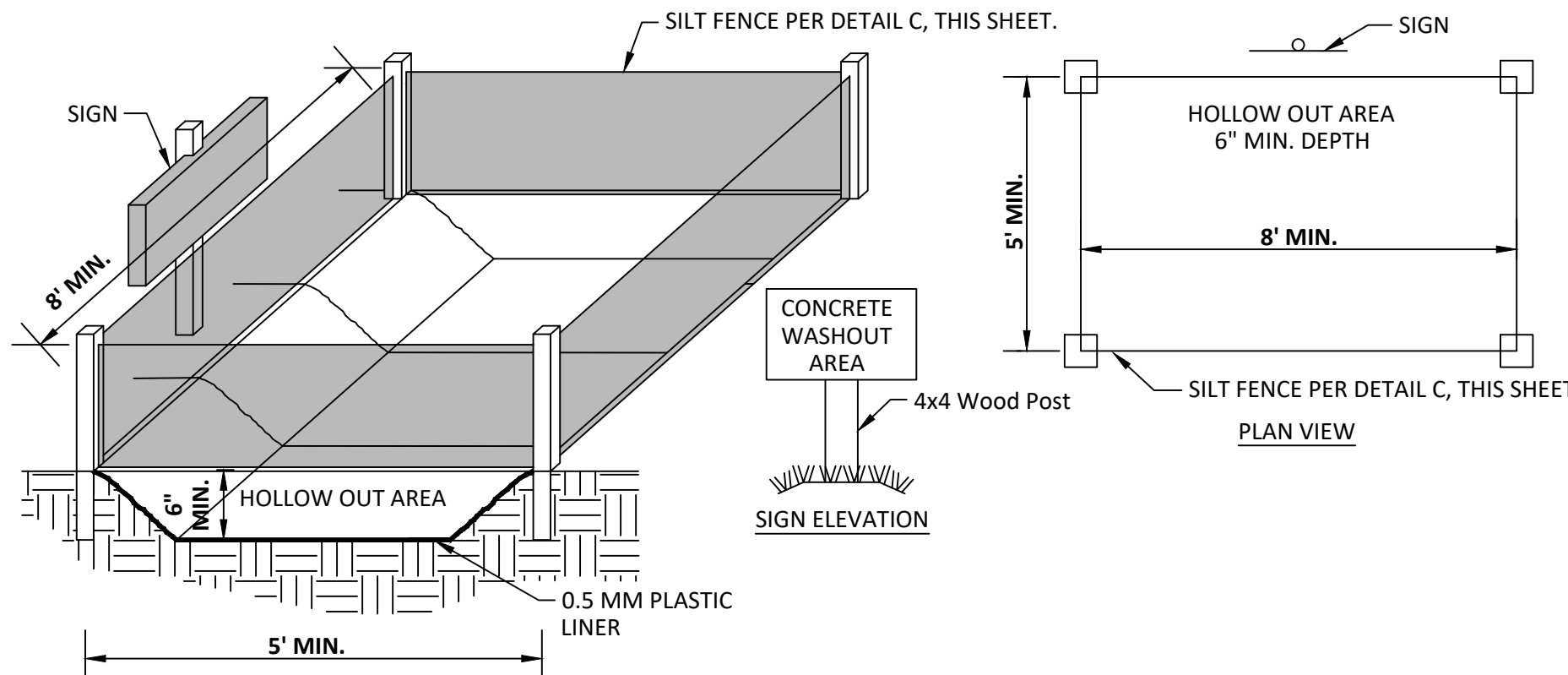
- INSTALLATION:**
1. REMOVE GRATE.
 2. INSTALL BAG (RESTS ON LIP OF CASTING).
 3. REINSTALL GRATE.
- MAINTENANCE:**
1. REMOVE GRATE.
 2. BAG CAN BE CLEANED SEVERAL WAYS:
 - A) PICK UP BAG AND DUMP IT.
 - B) SHOVELING DEBRIS OUT OF BAG
 - C) VAC-UNIT
 3. SHAKE LOOSE DEBRIS OUT OF BAG OR RINSE WITH WATER.
 4. REINSTALL BAG.
 5. REINSTALL GRATE.



- INSTALLATION:**
1. REMOVE GRATE.
 2. INSTALL BAG (RESTS ON LIP OF CASTING).
 3. REINSTALL GRATE.
 4. INSTALL BONNET GUARD WITH TABS BETWEEN GRATE & BONNET CASTING
- MAINTENANCE:**
1. REMOVE THE BONNET GUARD.
 2. REMOVE GRATE.
 3. BAG CAN BE CLEANED SEVERAL WAYS:
 - A) PICK UP BAG AND DUMP IT.
 - B) SHOVELING DEBRIS OUT OF BAG.
 - C) VAC-UNIT
 4. SHAKE LOOSE DEBRIS OUT OF BAG OR RINSE WITH WATER.
 5. REINSTALL BAG.
 6. REINSTALL GRATE.
 7. REINSTALL BONNET GUARD.

A DETAIL
INLET FILTER (BELOW GRATE INLET PROTECTION)

N.T.S.



- NOTES:**
1. CONCRETE TRUCKS SHALL UTILIZE AREAS TO WASHOUT TRUCKS.
 2. ACCUMULATED CONCRETE SHALL BE REMOVED FROM THE SITE AND DISPOSED PROPERLY.
 3. PLACE PLASTIC LINER OVER THE ENTIRE HOLLOW OUT AREA PRIOR TO USE.
 4. PROVIDE ITEMS NOTED ABOVE INCLUDING REMOVAL OF CONCRETE WASHOUT UPON COMPLETION OF THE PROJECT AS NOTED IN THE BID PRICE FOR THE PROJECT.
 5. FILL HOLLOW AREA TO A DEPTH OF 4 TO 6 INCHES WITH CMSC ITEM 703 AGGREGATE, SIZE #57, #2, OR #4.
 6. USE OF ROLL AWAY OR OTHER PORTABLE CONTAINERS IS AN ACCEPTABLE ALTERNATIVE (AND HIGHLY ENCOURAGED) PROVIDED THEY ARE USED IN ACCORDANCE WITH NPDES GUIDELINES ON CONCRETE WASHOUT.

B DETAIL
CONCRETE TRUCK WASHOUT AREA

N.T.S.

EROSION AND SEDIMENT CONTROL NARRATIVE

EROSION AND SEDIMENT CONTROL NARRATIVE:

PLAN DESIGNER: KORDA/NEMETH ENGINEERING INC. 1650 WATERMARK DRIVE, SUITE 200 COLUMBUS, OHIO 43215

OWNER: NAME: FRANKLIN COUNTY CONVENTION FACILITIES AUTHORITY
ADDRESS: 400 N HIGH ST. COLUMBUS, OHIO 43215
CONTACT: SCOTT REED
PHONE: 614-563-2555
EMAIL: SREED@FCCFA.ORG

NOI PERMIT: XXXXXXXX

EXISTING SITE CONDITIONS: THE SITE CONSISTS OF EXISTING GREATER COLUMBUS CONVENTION CENTER AND LOADING DOCK.

PROJECT DESCRIPTION: THE PROJECT INCLUDES ADDING SECURITY FENCING AROUND THE LOADING DOCK, 3 NEW GATES, AND A NEW GUARD SHACK TO THE GREATER COLUMBUS CONVENTION CENTER.

DISTURBED AREA: 0.10 ACRES

SITE DRAINS TO: SITE GENERALLY DRAINS TO A MUNICIPAL STORM SEWER WHICH EVENTUALLY DISCHARGES TO THE SCIOTO RIVER.

SITE BMPs: LOCATIONS OF SITE BMPs, INCLUDING DUMPSTERS, VEHICLE FUELING AREAS, CONCRETE TRUCK WASH, MATERIAL STORAGE, AND TOPSOIL STOCKPILES SHALL BE DETERMINED BY CONTRACTOR. IF FINAL LOCATION OF BMPs DIFFER FROM THE LOCATIONS SHOWN, CONTRACTOR SHALL MODIFY SWPPP AND INFORM OHIO EPA OF NEW LOCATION OF BMPs. NO POST-CONSTRUCTION BMPs WILL BE NECESSARY.

ADJACENT AREAS: THE SITE IS BOUNDED BY E GOODALE ST TO THE NORTH, COLUMBUS CONVENTION CTR DR TO THE SOUTH, COLUMBUS CONVENTION CTR DR TO THE EAST, AND N HIGH ST TO THE WEST.

SOILS: ACCORDING TO SOIL SURVEY RECORDS, THE SOIL TYPES ON THE SITE ARE CELINA-URBAN LAND COMPLEX (CFB) WHICH IS HYDROLOGIC SOIL GROUP C.

EROSION AND SEDIMENT CONTROL MEASURES: ANY NEW OR EXISTING STORM INLETS IMPACTED BY THE NEW CONSTRUCTION ACTIVITY WILL NEED THE APPROPRIATE INLET PROTECTION FOR SEDIMENT CONTROL. PROVIDE INLET PROTECTION AT EXISTING DRAINAGE STRUCTURES. ANY OFFSITE BORROW OR SPOIL AREAS SHALL BE SUBJECT TO THE REQUIREMENTS SET FORTH BY THE OHIO EPA. ALL EROSION AND SEDIMENT CONTROL MEASURES FOR OFFSITE AREAS NOT COVERED BY A SEPARATE NOI OR SWP3 SHALL BE COORDINATED WITH THE OHIO EPA. TRENDING GROUNDWATER CONTAINING SEDIMENT MUST BE EFFECTIVELY TREATED PRIOR TO DISCHARGE INTO THE STORM SEWER SYSTEM. USE MEANS NECESSARY TO CONTROL DUST ONSITE AND PREVENT TRACKING SOIL OFFSITE.

JURISDICTION: EROSION AND SEDIMENT CONTROL PRACTICES ARE SUBJECT TO FIELD MODIFICATION AT THE DISCRETION OF THE OHIO EPA.

CONSTRUCTION SEQUENCE
UNLESS NOTED OTHERWISE, THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ALL EROSION AND SEDIMENT CONTROL MEASURES REQUIRED THROUGHOUT THE DURATION OF THE PROJECT.

1. UTILIZE EXISTING PAVEMENT AS STABILIZED CONSTRUCTION ENTRANCE.
2. CONSTRUCT TEMPORARY SEDIMENT CONTROL, PERIMETER EROSION CONTROL MEASURES. MEASURES SHALL BE IMPLEMENTED AS THE FIRST STEP OF CONSTRUCTION.
3. DEMOLISH.
4. BACKFILL.
5. ROUGH GRADING. ADD ADDITIONAL SILT FENCE IF NECESSARY.
6. COMPLETE FINE GRADING AND PAVEMENT REPLACEMENT.
7. COMPLETE FINAL PAVING.
8. ONCE FINAL SEEDING HAS BEEN ESTABLISHED, CLEAN SEDIMENT FROM UNDERDRAINS AND STRUCTURES.
9. REMOVE TEMPORARY EROSION CONTROL MEASURES.

MAINTENANCE/INSPECTION PROCEDURES

1. CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EACH WEEK AND WITHIN 24-HOURS FOLLOWING ANY STORM EVENT OF 0.5 INCHES OR GREATER.
2. MEASURES SHALL BE MAINTAINED IN GOOD WORKING ORDER; IF A REPAIR IS NECESSARY, IT WILL BE INITIATED WITHIN 24 HOURS OF REPORT.
3. TEMPORARY AND PERMANENT SEEDING AND PLANTING WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND HEALTHY GROWTH.
4. A MAINTENANCE INSPECTION REPORT SHALL BE MADE AFTER EACH INSPECTION, AND A WRITTEN LOG MUST BE KEPT. THIS LOG SHALL INDICATE THE DATE OF THE INSPECTION, NAME OF THE INSPECTOR, WEATHER CONDITIONS, OBSERVATIONS, ANY CORRECTIVE ACTIONS TAKEN, AND BE SIGNED IN ACCORDANCE WITH THE CONDITIONS OF THE NPDES PERMIT. ANY CONTROL MEASURE MUST BE REPAIRED/REPLACED WITHIN THREE DAYS OF INSPECTION. PERSONNEL SELECTED FOR INSPECTION AND MAINTENANCE RESPONSIBILITIES SHALL BE TRAINED IN INSPECTION AND MAINTENANCE PRACTICES NECESSARY FOR KEEPING THE EROSION AND SEDIMENT CONTROLS USED ONSITE IN GOOD WORKING ORDER. A WRITTEN DOCUMENT CONTAINING THE SIGNATURES OF CONTRACTORS AND SUBCONTRACTORS INVOLVED IN THE IMPLEMENTATION OF EROSION AND SEDIMENT CONTROL MEASURES MUST BE MAINTAINED AS PROOF ACKNOWLEDGING THAT THEY REVIEWED AND UNDERSTAND THE CONDITIONS AND RESPONSIBILITIES OF THE PLAN. THE DOCUMENT SHALL BE CREATED BY THE CONTRACTOR SIGNED PRIOR TO THE START OF CONSTRUCTION.

- DISPOSAL OF SOLID/SANITARY/TOXIC WASTES**
1. SOLID, SANITARY AND TOXIC WASTES MUST BE DISPOSED OF IN A PROPER MANNER IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
 2. IT IS PROHIBITED TO BURN, BURY OR POUR OUT ONTO THE GROUND OR INTO A STORM WATER CONVEYANCE ANY SOLVENTS, PAINTS, STAINS, GASOLINE, DIESEL FUEL, USED MOTOR OIL, HYDRAULIC FLUID, ANTIFREEZE, CEMENT CURING COMPOUNDS AND OTHER SUCH SOLID AND HAZARDOUS WASTES.
 3. ANY RINSE WATERS OF SUCH MATERIAL ARE ALSO PROHIBITED FROM BEING PLACED WHERE THEY MAY ENTER DRAINAGEWAYS.
 4. WASH OUT OF CEMENT TRUCKS SHOULD OCCUR IN A DIKED, DESIGNATED AREA, AWAY FROM ANY CONVEYANCE CHANNEL.
 5. COORDINATE WASH OUT AREA WITH CONSTRUCTION MANAGER.

STABILIZATION PROCEDURES
CONTRACTOR SHALL BE RESPONSIBLE TO KEEP A RECORD OF DATES WHEN MAJOR GRADING ACTIVITIES OCCUR, WHEN EARTH DISTURBANCE HAS TEMPORARILY OR PERMANENTLY CEASED ON A PORTION OF THE SITE, AND WHEN STABILIZATION MEASURES HAVE BEEN INITIATED.

DEWATERING
DISCHARGES FROM DEWATERING ACTIVITIES, INCLUDING DISCHARGES FROM DEWATERING OF TRENCHES AND EXCAVATIONS ARE PROHIBITED UNLESS MANAGED BY APPROPRIATE CONTROLS.

GENERAL NOTES:

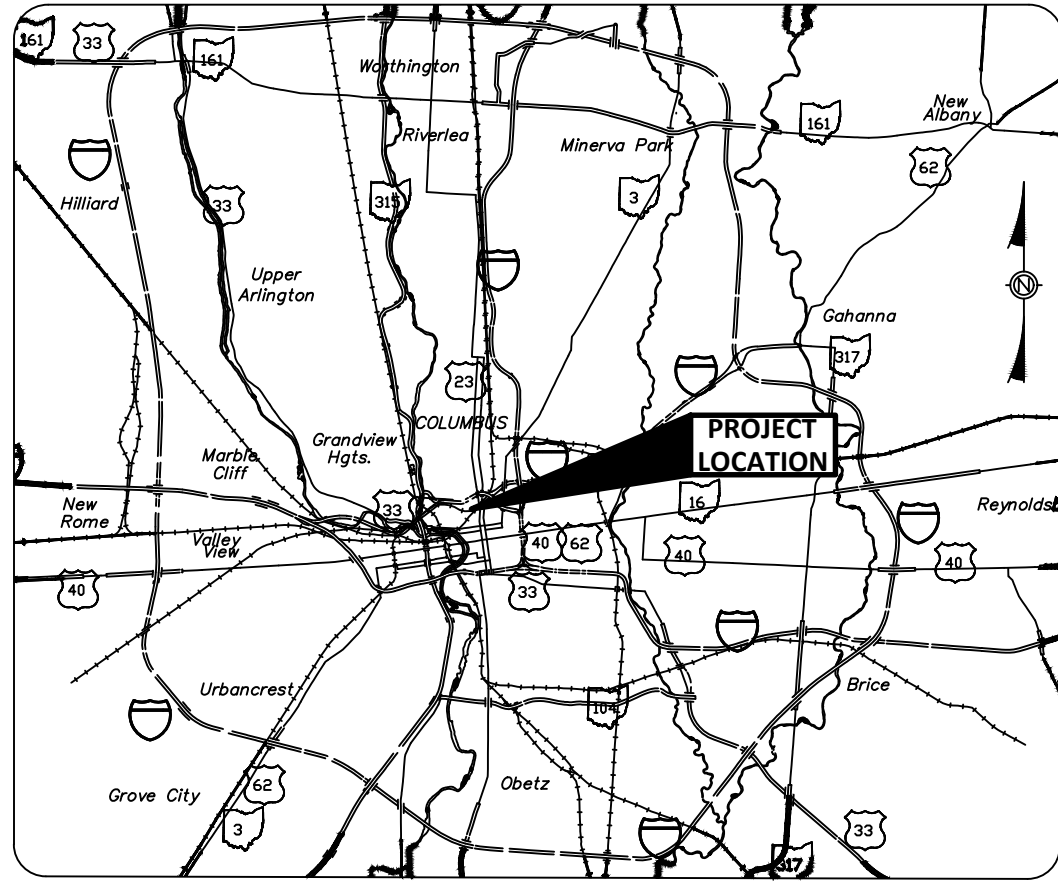
1. PROVIDE INLET SEDIMENT FILTER PER DETAIL A/THIS SHEET AT ALL EXISTING AND PROPOSED STORM INLET STRUCTURES RECEIVING FLOW FROM DISTURBED AREAS.
2. SOIL EROSION AND BMP MEASURES SHALL BE INSTALLED PRIOR TO START OF ANY CONSTRUCTION AND SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. BMP MEASURES SHALL BE TO THE SATISFACTION OF THE OHIO EPA. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND MODIFYING BMPs AND SWPPP AS NECESSARY DUE TO CONSTRUCTION PHASING AS THE PROJECT ADVANCES TO SATISFY THE OHIO EPA TO COMPLY WITH OHIO EPA PERMIT NO. OH0C00006 "GENERAL PERMIT AUTHORIZATION FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM".
3. UNDER NORMAL CIRCUMSTANCES, NO OVERLAND DISCHARGE SHALL BE ALLOWED FROM SEDIMENT BASIN.
4. DIRECT DISCHARGE OF SEDIMENT LADEN WATER TO THE CITY'S SEWER SYSTEM OR A RECEIVING STREAM IS A VIOLATION OF OHIO EPA REGULATIONS. THE CONTRACTOR WILL BE HELD LIABLE FOR THE VIOLATION AND SUBSEQUENT FINES.
5. THE EXACT LOCATION OF THE CONCRETE WASHOUT(S) MAY BE FIELD LOCATED BY THE ON-SITE PROJECT ENGINEER/CONTACT. APPLIES TO ALL SWP3 PLAN REVIEW PAGES.
6. UPPER BANK ABOVE NORMAL WATER ELEVATION SHOULD BE STABILIZED QUICKLY WITH STRAW BLANKETS, JUTTE MATTING OR SIMILAR GEO-TEXTILE.
7. ALL EROSION AND SEDIMENT CONTROL PRACTICES ARE SUBJECT TO FIELD MODIFICATION AT THE DISCRETION OF THE OHIO EPA.
8. ANY EXISTING STORM INLETS IMPACTED BY THE NEW CONSTRUCTION ACTIVITY WILL NEED THE APPROPRIATE INLET PROTECTION FOR SEDIMENT CONTROL.
9. STREET CLEANING (ON AN AS-NEEDED BASIS) IS REQUIRED THROUGH THE DURATION OF THIS CONSTRUCTION PROJECT. THIS INCLUDES SWEEPING, POWER CLEANING AND IF NECESSARY MANUAL REMOVAL OF DIRT OR MUD IN THE STREET GUTTERS.
10. THIS PLAN MUST BE POSTED ON-SITE. A COPY OF THE SWPPP PLAN AND THE APPROVED EPA STORMWATER PERMIT (WITH THE SITE-SPECIFIC NOI NUMBER) SHALL BE KEPT ON-SITE AT ALL TIMES.
11. STRAW WATTLES OR COMPOST ROLLS HAVE TO BE A MINIMUM OF 12 INCHES IN DIAMETER (OEPA).

No.	Description	Date

GREATER COLUMBUS CONVENTION CENTER SITE SECURITY IMPROVEMENTS BID DOCUMENTS	
KORDA Korda/Nemeth Engineering, Inc. - Consulting Engineers 1650 Watermark Drive, Suite 200 - Columbus, Ohio 43215-7010 TEL 614-487-1650 - WEB www.korda.com	

EROSION & SEDIMENT CONTROL			
PROJECT NUMBER:		2026-0416	
DRAWN BY:	KEV	DATE	SHEET NUMBER
DESIGNED BY:	KEV	09/25/2026	C2.1
CHECKED BY:	GJW		
PROJECT NUMBER:	2026-0416		

KORDA KORDA/NEMETH ENGINEERING WWW.KORDA.COM
DRAWN BY: KATIE VATKE
DESIGNED BY: KATIE VATKE
CHECKED BY: GRAHAM WATKINS
PROJECT NUMBER: 2026-0416



VICINITY MAP
NOT TO SCALE

INDEX OF SHEETS
TITLE SHEET 1/2 C3.1
PLAN & PROFILE 2/2 C3.2

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF PROVIDING 990 FEET OF ADDITIONAL SITE SECURITY FENCING TO THE GREATER COLUMBUS CONVENTION CENTER LOADING DOCK AREA INCLUDING 3 GATES AND A REPLACED GUARD SHACK. ONE ADDITIONAL FIRE HYDRANT IS TO BE CONSTRUCTED OUTSIDE OF THE FENCE AS WELL AS MOVING 3 WATER VALVES TO ENSURE ACCESS OUTSIDE THE FENCE.

SITE DATA TABLE	
TOTAL SITE AREA:	19.15 AC
TOTAL DISTURBED AREA:	0.10 AC
DISTURBED IMPERVIOUS AREA:	0.03 AC
PRE-DEVELOPED IMPERVIOUS AREA:	0.03 AC
POST-DEVELOPED IMPERVIOUS AREA	0.05 AC

BENCHMARKS

No.	Elevation	Description
1	750.06	Chiseled "X" on East Flange Bolt of Fire Hydrant
2	752.07	Chiseled Square on Northeast Corner of Concrete Light Pole Base
3	751.32	Chiseled Square on North Side of the Bridge Pier Base
4	759.61	Chiseled Square on Northwest Corner of Concrete Light Pole Base
5	763.81	Chiseled "X" on West Flange Bolt of Fire Hydrant
6	755.49	Chiseled "X" on Northeast Flange Bolt of Fire Hydrant

*Elevations are based on NAVD 88 utilizing The Ohio Department of Transportation Ohio Real Time Network (ODOT RTN) with GEOID18. Source Benchmark is Franklin County Survey Control Designation N308 with an elevation of 752.910 (NAVD 88). Source Benchmark was verified by GPS methods. Horizontal and vertical units are in U.S. Survey Feet.

GENERAL NOTES

- THE CITY OF COLUMBUS CONSTRUCTION AND MATERIALS SPECIFICATIONS (CMSC), INCLUDING ALL REVISIONS, SUPPLEMENTS AND STANDARD DRAWINGS, SHALL BE THE LATEST VERSION PUBLISHED AT THE TIME OF SIGNATURE BY THE DIRECTOR OF PUBLIC SERVICE AND SHALL GOVERN ALL ITEMS THAT ARE A PART OF THIS PLAN UNLESS NOTED OR DATED OTHERWISE.
- ALL WATER MAIN MATERIALS AND INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE CURRENT RULES AND REGULATIONS OF THE CITY OF COLUMBUS, DIVISION OF WATER. ALL CITY OF COLUMBUS, DIVISION OF WATER STANDARD DRAWINGS SHALL APPLY TO THE PROJECT, UNLESS OTHERWISE NOTED.
- FOR ANY EMERGENCIES INVOLVING THE WATER DISTRIBUTION SYSTEM, PLEASE CONTACT THE DIVISION OF WATER DISTRIBUTION MAINTENANCE OFFICE AT 614-645-7788.
- ALL BRASS FITTINGS ASSOCIATED WITH WATER WORK, INCLUDING REPAIRS TO THE EXISTING SYSTEM, SHALL CONFORM TO THE REVISED ALLOWABLE LEAD EXTRACTION LIMIT PER THE UPDATED NSF/ANSI 61 STANDARD. THE DIVISION OF WATER'S APPROVED MATERIALS LIST HAS BEEN UPDATED TO REFLECT THIS REQUIREMENT.
- IT SHALL BE UNLAWFUL FOR ANY PERSON TO PERFORM ANY WORK ON CITY OF COLUMBUS WATER MAIN SYSTEMS WITHOUT FIRST SECURING LICENSE TO ENGAGE IN SUCH WORK, AS INDICATED IN COLUMBUS CITY CODE SECTION 1103.02 AND 1103.06. THIS WORK INCLUDES ANY ATTACHMENTS, ADDITIONS TO OR ALTERATIONS IN ANY CITY SERVICE PIPE OR APPURTENANCES (INCLUDING WATER SERVICE LINES AND TAPS). THIS REQUIREMENT MAY BE MET BY UTILIZATION OF A SUBCONTRACTOR WHO HOLDS A CITY OF COLUMBUS WATER CONTRACTOR LICENSE OR A COMBINED WATER/SEWER CONTRACTOR LICENSE TO PERFORM THIS WORK. UTILIZATION OF A SUBCONTRACTOR MUST MEET THE LICENSING REQUIREMENTS OF CITY OF COLUMBUS BUILDING CODE, IN PARTICULAR SECTION 4314.110 AND 4314.525.
- N/A.
- THE CONTRACTOR SHALL OBTAIN THE PROPER HYDRANT PERMIT(S), AND PAY ANY APPLICABLE FEES, FOR ANY APPROVED HYDRANT USAGE DEEMED NECESSARY FOR WORK UNDER THIS IMPROVEMENT. PERMITS MAY BE OBTAINED THROUGH THE DIVISION OF WATER PERMIT OFFICE (614-645-7330). THE CONTRACTOR SHALL ADHERE TO ALL RULES & REGULATIONS GOVERNING SAID PERMIT AND MUST HAVE THE ORIGINAL PERMIT ON SITE ANYTIME IN WHICH THE HYDRANT IS IN USE. PERMITS MAY BE OBTAINED BY ACCESSING [HTTP://PORTAL.COLUMBUS.GOV/PERMITS/](http://portal.columbus.gov/permits/). COST TO BE INCLUDED IN THE VARIOUS BID ITEMS.
- N/A.
- ALL FIRE HYDRANTS TO BE INSTALLED IN THE CITY OF COLUMBUS SHALL BE PAINTED WITH THE COLOR "SAFETY ORANGE". THE FIRE HYDRANTS SHALL BE PROVIDED WITH TWO COATS IN A GLOSS ENAMEL OF THE "SAFETY ORANGE" COLOR FOR THE ENTIRE HYDRANT. THE TOPS OF THE FIRE HYDRANTS ARE NO LONGER REQUIRED TO BE PAINTED BLACK. AFTER INSTALLATION OF FIRE HYDRANTS, THE CONTRACTOR IS RESPONSIBLE TO APPLY TOUCH UP PAINT TO ANY DAMAGE TO THE FACTORY APPLIED HYDRANT PAINT. HYDRANTS WILL NOT BE ACCEPTED UNTIL ANY PAINT DAMAGE FROM SHIPPING OR INSTALLATION HAS BEEN REPAIRED. USE HYDRANT TOUCH UP PAINT IN ACCORDANCE WITH THE APPROVED MATERIALS LIST.
- ALL FIRE HYDRANTS, WHETHER NEW OR RELOCATED, SHALL BE INSPECTED AND APPROVED BY THE DIVISION OF FIRE PRIOR TO BEING PUT INTO SERVICE. THE CONTRACTOR SHALL CONTACT THE DIVISION OF FIRE AT 614-645-8873 TO SCHEDULE THE INSPECTION OF THE NEW OR RELOCATED FIRE HYDRANTS. THE CITY WILL PROVIDE THE CONTRACTOR "OUT OF SERVICE" RINGS THAT SHALL BE PLACED ON ALL NEW OR RELOCATED FIRE HYDRANTS TO CLEARLY IDENTIFY THEM AS INACTIVE. AFTER WRITTEN NOTIFICATION OF ACCEPTANCE HAS BEEN RECEIVED AND FINAL WATER MAIN CONNECTIONS HAVE OCCURRED, THE CONTRACTOR SHALL REMOVE THE "OUT OF SERVICE" RINGS FROM THE FIRE HYDRANTS. ALL "OUT OF SERVICE" RINGS SHALL BE RETURNED TO THE CITY. ALL COORDINATION AND WORK REQUIRED TO TEST AND ACCEPT THE FIRE HYDRANTS SHALL BE INCLUDED IN THE PRICE BID ITEM 809.
- MAINTAIN EIGHTEEN (18) INCHES VERTICAL AND TEN (10) FEET HORIZONTAL SEPARATION BETWEEN ANY SANITARY OR STORM SEWER PIPING AND ALL PROPOSED WATER MAINS.
- WHEN CROSSING THE EXISTING WATER MAIN, AND LOW STRENGTH MORTAR (ITEM 613) IS TO BE USED AS BACKFILL, THE CONTRACTOR SHALL PROVIDE SIZE NO. 57 CRUSHED CARBONATE STONE (CCS) 1 FOOT BELOW TO 1 FOOT ABOVE THE EXISTING WATER MAIN.
- IF DURING EXCAVATION, THE POLYETHYLENE ENCASMENT ON THE EXISTING WATER MAIN BECOMES DAMAGED, THE CONTRACTOR SHALL REPAIR THE POLYETHYLENE ENCASMENT PER MANUFACTURER'S SPECIFICATIONS AND DOW STANDARD DRAWINGS L-1003 AND L-1004, AT THEIR OWN EXPENSE. ENSURE THAT THE ENTIRE EXPOSED AREA IS COVERED WITH NEW POLYETHYLENE ENCASMENT AND SECURELY TAPED, PRIOR TO BACKFILLING.
- CONTRACTOR SHALL ADHERE TO THE REQUIREMENTS OF THE OHIO ADMINISTRATIVE CODE CHAPTER 3745-83.02 WATER DISRUPTION OF SERVICE RULE. EXCAVATE PITS SUFFICIENTLY BELOW THE AREA TO BE CONNECTED TO IN ORDER TO MAINTAIN WATER LEVELS BELOW THE WATER MAIN. IF WATER FROM THE PIT ENTERS THE EXISTING MAIN, CONTACT DIVISION OF WATER IMMEDIATELY. ENSURE THAT SUFFICIENTLY SIZED PUMPS ARE UTILIZED TO REMOVE WATER FROM THE TRENCH AND BACKUP PUMPS ARE KEPT ON SITE FOR REDUNDANCY.
- "ITEM SPECIAL - SURVEY COORDINATES" SHALL INCLUDE ALL MATERIAL, EQUIPMENT, AND LABOR NECESSARY TO OBTAIN HORIZONTAL AND VERTICAL (NORTHING, EASTING, AND CENTERLINE OF PIPE ELEVATION) SURVEY COORDINATES FOR THE WATER MAIN IMPROVEMENTS. THE SURVEY COORDINATES SHALL BE OBTAINED FOR THE COMPLETED WATER MAIN CONSTRUCTION AND SHALL INCLUDE ALL VALVES, TEES, CROSSES, BENDS, HORIZONTAL DEFLECTIONS, PLUGS, REDUCERS, TAPPING SLEEVES, FIRE HYDRANTS, AIR RELEASES, CURB STOPS, TRACER WIRE BOXES, AND CASING PIPE TERMINI. ADDITIONAL SURVEY COORDINATES ARE REQUIRED ON THE WATER MAIN EVERY 200 FEET WHERE NO FITTING OR OTHER WATER MAIN STRUCTURE IS BEING INSTALLED WITHIN THAT LENGTH OF THE IMPROVEMENT.

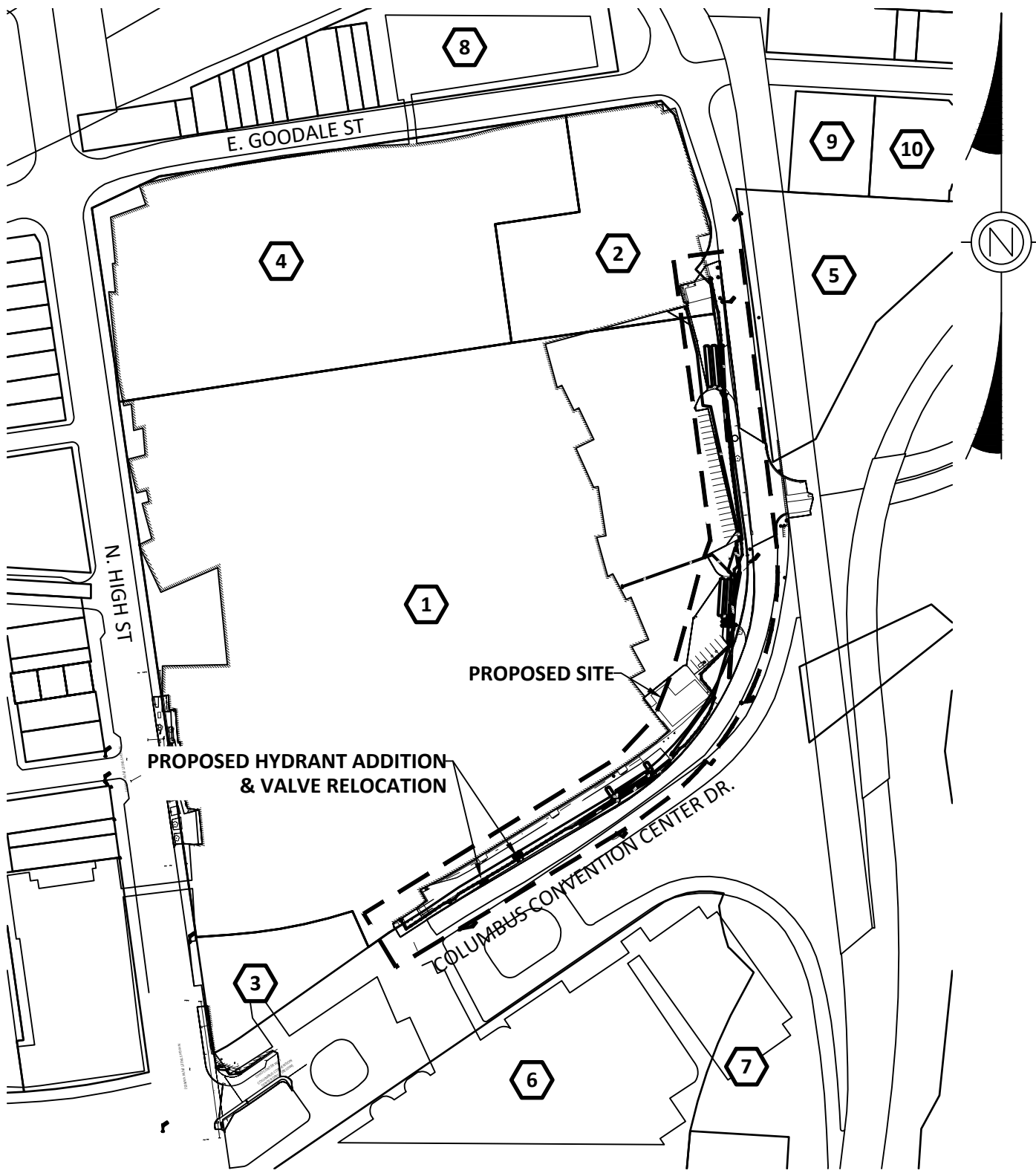
THE COORDINATES SHALL BE DOCUMENTED TO THE ENGINEER IN DIGITAL SPREADSHEET FORM AND SHALL INCLUDE THE APPLICABLE ITEM, STATION, NORTHING, EASTING, AND CENTERLINE OF PIPE ELEVATION. COORDINATES SHALL BE SUBMITTED TO THE ENGINEER ON A BI-WEEKLY BASIS. COORDINATES SHALL ALSO BE REQUIRED TO BE SUBMITTED TO THE DIVISION OF WATER AS PART OF THE REQUEST FOR CHLORINATION.

LUMP SUM PAYMENT IS FULL COMPENSATION FOR ALL WORK INVOLVED IN OBTAINING AND DOCUMENTING THE SURVEY COORDINATES AS DESCRIBED IN THIS SPECIFICATION.

EASEMENT REFERENCE		REVISIONS			PREPARED BY:
COUNTY RECORDER INSTRUMENT NUMBER	DATE RECORDED	NO.	DESCRIPTION	APPROVAL/DATE	
					 ENGINEER KORDA NEMETH ENGINEERING 1855 Watermark Drive, Suite 200 • Columbus, Ohio 43215-7010 614-487-1650 • FAX 614-487-1651 • WEB www.korda.com

**CITY OF COLUMBUS, OHIO DEPARTMENT OF
PUBLIC UTILITIES DIVISION OF WATER
GREATER COLUBUS CONVENTION CENTER
SECURITY IMPROVEMENTS
WATERLINE ONLY**

400 N. HIGH STREET, COLUMBUS, OH 43215



LOCATION MAP
SCALE: 1" = 200'

FINAL SITE COMPLIANCE PLAN 26345-00436

STANDARD DRAWINGS

THE STANDARD DRAWINGS LISTED ON THIS PLAN SHALL BE CONSIDERED A PART THEREOF.

L-1003
L-1004
L-6637A

CITY OFFICIALS

ANDREW J. GINTHER ~ MAYOR

KRISTEN ATHA
DIRECTOR, DEPARTMENT OF PUBLIC UTILITIES

MEMBERS OF CITY COUNCIL

SHARRON G. HARDIN ~ PRESIDENT
CHRISTOPHER L. WYCHE
LOURDES BARROSO DE PADILLA
EMMANUEL V. REMY
TIARA N. ROSS
NICHOLAS J. BANKSTON
ROB DORANS
NANCY DAY-ACHAUER
MELISSA GREEN

SPECIFICATIONS

THE CITY OF COLUMBUS CONSTRUCTION AND MATERIAL SPECIFICATIONS (CMSC), 2018 EDITION AND REVISIONS, INCLUDING SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

APPROVALS

SIGNATURES BELOW SIGNIFY ONLY CONCURRENCE WITH THE GENERAL PURPOSE AND GENERAL LOCATION OF THE PROJECT. ALL TECHNICAL DETAILS REMAIN THE RESPONSIBILITY OF THE ENGINEER PREPARING THE PLANS.

CITY OF COLUMBUS

FIRE PREVENTION BUREAU, DIVISION OF FIRE

DATE

ADMINISTRATOR, DIVISION OF POWER

DATE

ADMINISTRATOR, DIVISION OF WATER RECLAMATION

DATE

ADMINISTRATOR, DIVISION OF WATER

DATE

CITY ENGINEER/ADMINISTRATOR, DIVISION OF DESIGN AND CONSTRUCTION

DATE

PROPERTY OWNERS

X	OWNER NAME	PARCEL	ADDRESS	ZONING CLASS
1	CITY OF COLUMBUS	010-187794	500 N HIGH ST.	DD
2	CITY OF COLUMBUS	010-187795	GOODALE ST.	DD
3	FRANKLIN COUNTY CONVENTION FACILITIES AUTHORITY	010-300577	402 N HIGH ST.	DD
4	FRANKLIN COUNTY CONVENTION FACILITIES AUTHORITY	010-004707	562 N HIGH ST.	DD
5	STATE OF OHIO (ODOT)	010-186114	550 CONVENTION CENTER DR.	DD
6	CITY OF COLUMBUS	010-187793	400 N HIGH ST.	DD
7	CITY OF COLUMBUS	010-248376	E NATIONWIDE BL.	DD
8	FRANKLIN COUNTY CONVENTION FACILITIES AUTHORITY	010-057386	70 E GOODALE ST.	DD
9	FRANKLIN COUNTY CONVENTION FACILITIES AUTHORITY	010-039371	E GOODALE ST.	DD
10	FRANKLIN COUNTY CONVENTION FACILITIES AUTHORITY	010-005680	161 E GOODALE ST.	DD
11	FRANKLIN COUNTY CONVENTION FACILITIES AUTHORITY	010-066002	NATIONWIDE BL.	DD

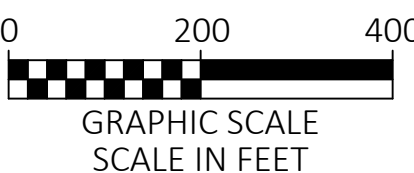
FOR WATER MAIN ONLY PLANS:

- PERMITS: WHEN EXCAVATING WITHIN COLUMBUS PUBLIC RIGHT OF WAY LIMITS, THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT FROM CITY OF COLUMBUS, DEPARTMENT OF PUBLIC SERVICE - PERMIT OFFICE; PHONE: (614) 645-7497; FAX: (614) 645-1876; EMAIL: COLSPERMITS@COLUMBUS.GOV
- THE DEVELOPER SHALL ENTER INTO AN AGREEMENT WITH THE CITY OF COLUMBUS, DIVISION OF WATER IN ACCORDANCE WITH SECTION 1105.15 OF THE COLUMBUS CITY CODES PRIOR TO CONSTRUCTING ANY WATER MAINS.
- THE DEVELOPER SHALL DEPOSIT WITH THE CITY OF COLUMBUS THE TOTAL ESTIMATED COST FOR CONSTRUCTION INSPECTION PRIOR TO ANY CONSTRUCTION OPERATION. CONTACT THE DPU PERMIT OFFICE AT (614) 645-7330 TO PAY STANDBY INSPECTION FEES. A COMPLETED WATER AGREEMENT FORM WILL ALSO NEED SUBMITTED TO THE DPU PERMIT OFFICE AT THAT TIME.
- THE CITY OF COLUMBUS INSPECTION WILL BE PERFORMED BY THE DEPARTMENT OF PUBLIC SERVICE (DPS). CONTACT DPS AT (614) 645-0433 FOR ADDITIONAL INFORMATION.
- PUBLIC TREE PRESERVATION AND PUBLIC TREE PROTECTION NOTES: CONSULTANT SHALL USE THE LATEST VERSION OF THE CRPD STANDARD NOTES FOR CONSTRUCTION, FOUND AT [HTTPS://COLUMBUSREPCPARKS.COM/CONNECT/BUSINESS-RESOURCES/](https://columbusrepcparks.com/connect/business-resources/)
- THERE WILL BE NO COST PARTICIPATION BY THE CITY OF COLUMBUS, DIVISION OF WATER FOR THE INSTALLATION OF THE FIRE HYDRANT ON CONVENTION CENTER WAY.
- N/A

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER

TITLE SHEET

GREATER COLUMBUS CONVENTION
CENTER SECURITY IMPROVEMENTS



26-090

1
2

No.	Description	Date
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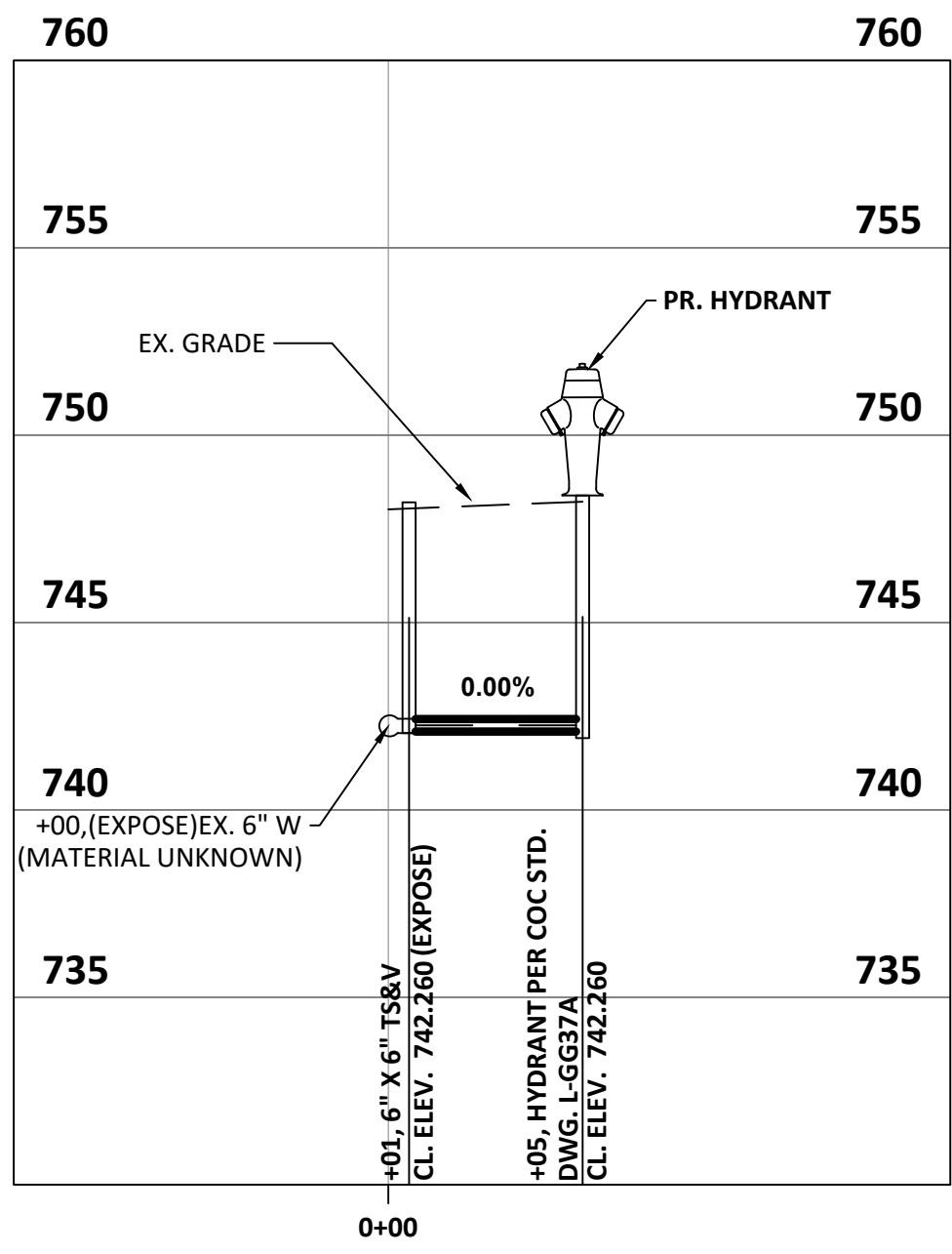
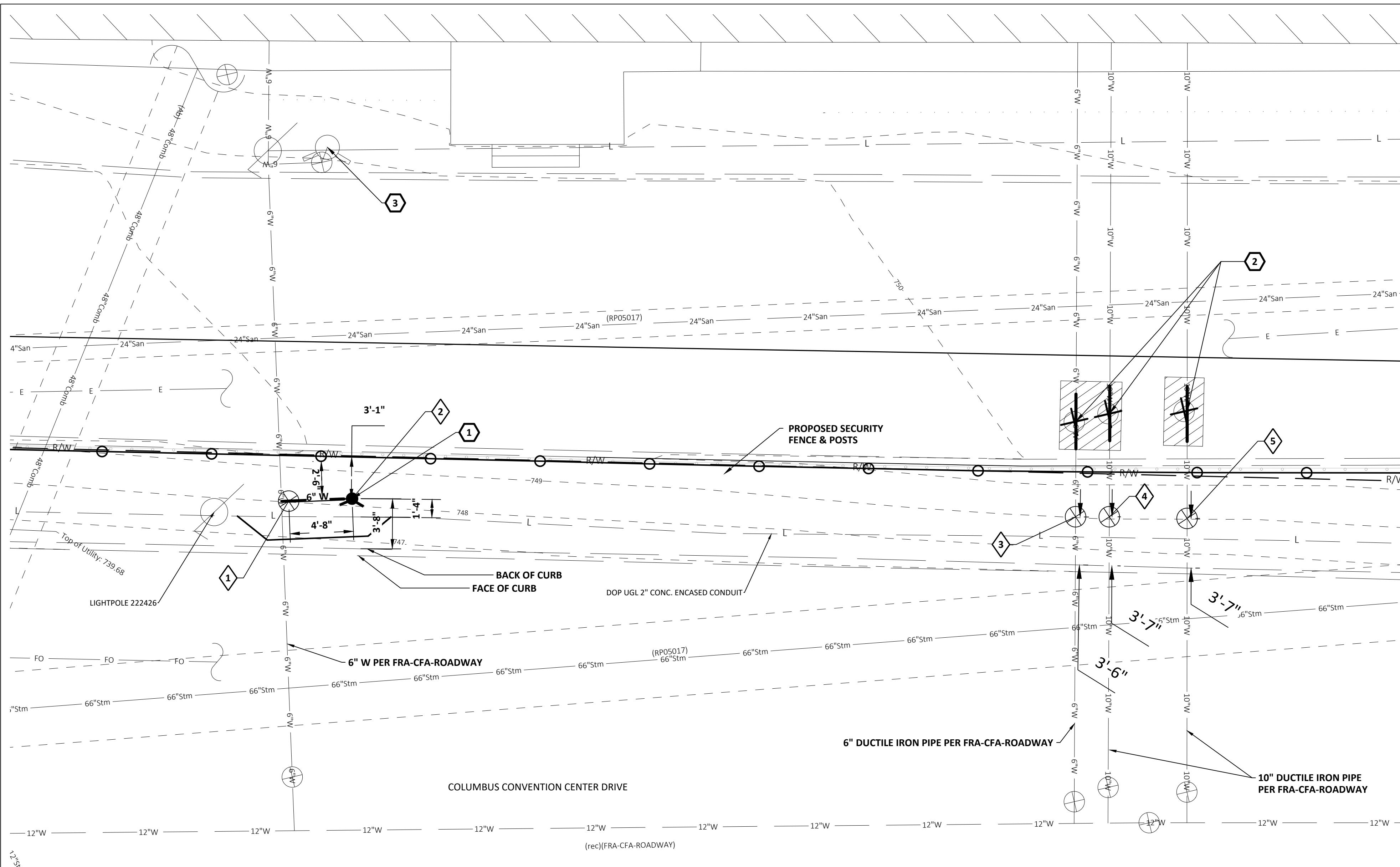
GREATER COLUMBUS CONVENTION CENTER
SITE SECURITY IMPROVEMENTS
BID DOCUMENTS

KORDA Korda/Nemeth Engineering, Inc. - Consulting Engineers
1855 Watermark Drive, Suite 200 • Columbus, Ohio 43215-7010
TEL 614-487-1650 • WEB www.korda.com

**WATERLINE - TITLE
SHEET**

PROJECT NUMBER:	2026-0416		
DRAWN BY:	KEV	DATE	SHEET NUMBER
DESIGNED BY:	KEV	09/25/2026	C3.0
CHECKED BY:	GJW		

KORDA
KORDA NEMETH ENGINEERING
WWW.KORDA.COM
DRAWN BY: KATIE VATKE
DESIGNED BY: KATIE VATKE
CHECKED BY: GRAHAM WATKINS
PROJECT NUMBER: 2026-0416



ADDITIONAL HYDRANT PROFILE
SCALE: 1"=5' HORIZ. 1"=5' VERT.

LEGEND

EXISTING

- WATER LINE
- VALVE
- FIRE HYDRANT
- UNDERGROUND LIGHTING CIRCUIT
- STORM SEWER
- SANITARY SEWER
- CONTOUR LINE
- GUARD RAIL

PROPOSED

- WATER LINE
- FIRE HYDRANT
- GATE VALVE & CURB BOX
- REMOVE EXISTING VALVE AND REPLACE WITH DUCTILE IRON PIPE
- PAVEMENT REPLACEMENT PER STD. DWG. 1441

GENERAL NOTES:

- WHERE PLANS PROVIDE FOR A PROPOSED UTILITY TO BE CONNECTED TO, OR CROSS OVER, OR UNDER AN EXISTING UNDERGROUND UTILITY, THE CONTRACTOR SHALL LOCATE THE EXISTING PIPES OR UTILITIES, BOTH AS TO LINE AND GRADE BEFORE STARTING TO LAY THE PROPOSED UTILITY. THESE LOCATIONS ARE NOTED THUS: EXPOSE. IF IT IS DETERMINED THAT THE ELEVATION OF THE EXPOSED UTILITY DIFFERS FROM THE PLAN ELEVATION, RESULTS IN A CHANGE IN THE PLAN SEWER SLOPE, OR WILL INTERSECT AN EXISTING UTILITY AS SHOWN ON THE PLAN, THE ENGINEER SHALL BE NOTIFIED BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THE PROPOSED UTILITY WHICH WILL BE AFFECTED BY THE VARIANCE IN THE EXISTING ELEVATIONS.

CODED NOTES:

- FIRE HYDRANT TYPE A PER COC STD. DWG. L-6637A
- REMOVE VALVE AND SLEEVE PIPE.
- PROTECT EXISTING FIRE HYDRANT TO REMAIN.

ESTIMATE OF QUANTITIES

These quantities have been provided only as an estimate to the scope of the work for inspection purposes only. The Contractor is solely responsible to evaluate the complete project as detailed in the notes, plans, and specifications and procedures necessary for the completion of the plan improvements and submit his total project cost accordingly. Deviation between the plans and the quantities shall not be cause for additional compensation. Submission of bid means acceptance of entire project, whether or not described in the table below.

ITEM	QUANTITY	UNIT	DESCRIPTION
801	10	LF	6 INCH PIPE AND FITTINGS
801	8	LF	10 INCH PIPE AND FITTINGS
802	1	EA	6 INCH VALVE & APPURTENANCES
802	2	EA	10 INCH VALVE & APPURTENANCES
803	1	EA	6" X 6" TAPPING SLEEVE & VALVE & APPURTENANCES
809	1	EA	FIRE HYDRANT
SPEC	1	LUMP	SURVEY COORDINATES
SPEC	3	EA	VALVE DEMOLITION

WATER SERVICE COORDINATES

NO.	TYPE	NORTHING	EASTING	NORTHING AS-BUILT	EASTING AS-BUILT	CENTERLINE ELEVATION
1	6" x 6" TAPPING SLEEVE & VALVE	718333.99	1828152.70			
2	PROPOSED FIRE HYDRANT	718336.59	1828156.53			
3	6" VALVE	718363.36	1828202.11			
4	10" VALVE	718364.66	1828204.21			
5	10" VALVE	718367.56	1828209.10			

COLUMBUS PARKS AND RECREATION GENERAL NOTES

PUBLIC TREE REMOVAL AND MITIGATION NOTE

NO PUBLIC TREE REMOVAL SHALL BE ATTEMPTED BY CONSTRUCTION PERSONNEL OR EQUIPMENT, EXCEPT UNDER THE SUPERVISION OF A CERTIFIED ARBORIST. ALL TREES REMOVED SHALL INCLUDE STUMP REMOVAL GROUND TO 18 INCHES. IF THE REMOVED TREE IS WITHIN 36 INCHES OF A PROTECTED TREE, THE STUMP SHALL ONLY BE GROUND TO A DEPTH OF 2 INCHES. ALL WOOD DEBRIS ON CITY OF COLUMBUS PROPERTY SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR BY THE END OF EACH WORK DAY. TREES APPROVED FOR REMOVAL BY CRPD FORESTRY SHALL BE MITIGATED IN ACCORDANCE WITH THE COLUMBUS TREE TECHNICAL MANUAL AND COLUMBUS CITY CODES CHAPTER 912.

PUBLIC TREE PROTECTION NOTE

ALL PUBLIC TREES AND THE GROUND IN THE CRITICAL ROOT ZONE, WHETHER SHOWN OR NOT SHOWN ON THE PLANS, ARE TO BE PROTECTED UNLESS A PERMIT TO REMOVE IS GIVEN BY COLUMBUS RECREATION & PARKS (CRPD) FORESTRY. THE CONTRACTOR SHALL PROTECT TREES NEAR OR ADJACENT TO THE WORK AREA TO AVOID DAMAGE TO ALL TREES THAT ARE TO REMAIN. HEAVY EQUIPMENT WILL NOT BE ALLOWED TO COMPACT THE SOIL OVER THE CRITICAL ROOT ZONE OF EXISTING PUBLIC TREES. RESTRICTED EQUIPMENT ACCESS ROUTES SHALL BE COORDINATED WITH CRPD FORESTRY AT FORESTRY@COLUMBUS.GOV BEFORE WORK BEGINS. TEMPORARY PAVING MATERIALS, SUCH AS PLYWOOD, LUMBER OR RUBBER MATTING, SPREAD OVER THE ROOT ZONE OF PUBLIC TREES MAY BE REQUIRED TO PREVENT COMPACTION. CONSTRUCTION MATERIALS, EXCAVATION DEBRIS, FUEL, EQUIPMENT, OR VEHICLES ARE NOT TO BE STOCKPILED, STORED, DUMPED, OR PARKED WITHIN THE CRITICAL ROOT ZONE OF PUBLIC TREES. ALL TREES MUST BE PROTECTED AGAINST INJURY OR DAMAGE TO BRANCHES, TRUNKS, OR ROOTS FROM CONSTRUCTION AND EXCAVATION, AS DESCRIBED IN THE CRPD TREE TECHNICAL MANUAL. IF THERE IS A QUESTION REGARDING TREE PROTECTION NEEDS, THE CONTRACTOR MUST CONTACT THE CITY FORESTRY SECTION AT FORESTRY@COLUMBUS.GOV.

FORESTRY PERMIT NOTE

ANY WORK ON OR WITHIN THE CRITICAL ROOT ZONE OF A PUBLIC TREE REQUIRES A FORESTRY PERMIT. ALL APPLICABLE FEES MUST BE PAID PRIOR TO PERMIT ISSUANCE. REFER TO THE CRPD TREE TECHNICAL MANUAL FOR TREE REMOVAL, PRUNING, PROTECTION, AND MITIGATION STANDARDS.

OAK WILT NOTE

TO PREVENT THE SPREAD OF OAK WILT, A FUNGAL DISEASE, OAK TREES SHALL ONLY BE PRUNED FROM NOVEMBER 1 TO MARCH 1.

THE DIVISION OF POWER

THE DIVISION OF POWER (DOP) MAY HAVE OVERHEAD AND UNDERGROUND PRIMARY, SECONDARY, AND STREET LIGHTING AT THIS WORK LOCATION. THE CONTRACTOR IS HEREBY REQUIRED TO CONTACT OHIO 811 (PREVIOUSLY OUPS) AT 811 OR 1-800-362-2764 FORTY-EIGHT HOURS PRIOR TO CONDUCTING ANY ACTIVITY WITHIN THE CONSTRUCTION AREA.

ANY PROJECT, BOTH PUBLIC OR PRIVATE, WITH IMPACTS REQUIRING RELOCATION, SUPPORT, PROTECTION, OR ANY OTHER ACTIVITY CONCERNED WITH THE CITY'S ELECTRICAL FACILITIES IN THE CONSTRUCTION AREA IS TO BE PERFORMED BY THE CONTRACTOR UNDER THE DIRECTION OF DOP PERSONNEL AND AT THE EXPENSE OF THE PROJECT.

UNLESS PREVIOUSLY AUTHORIZED, DOP SHALL MAKE ALL FINAL CONNECTIONS TO DOP'S EXISTING ELECTRICAL SYSTEM AT THE EXPENSE OF THE PROJECT.

NO PERSON SHALL WORK ON DOP FACILITIES UNLESS THEY HAVE COMPLETED CONTRACTOR SAFETY ORIENTATION WITH DOP. ANY PERSON WORKING ON DOP FACILITIES ON LIVE CONDUCTORS OR CONDUCTORS THAT MAY BECOME LIVE SHALL COMPLY WITH DOP'S CONDUCTOR SAFETY POLICY (TDMIS-1603), HOLD CARD SYSTEM (TDMIS-1604), AND STREET LIGHT LOCK OUT TAG OUT PROCEDURE (MIS-1). PRIOR TO BEGINNING WORK ON DOP FACILITIES, EACH PERSON SHALL CONTACT DOP'S DISPATCH OFFICE AT 614-645-7627 AND PROVIDE THEIR NAME, PHONE NUMBER, LOCATION, DESCRIPTION OF WORK, AND CIRCUIT NUMBER. AT COMPLETION OF WORK, EACH PERSON SHALL NOTIFY DOP'S DISPATCH OFFICE.

THE CONTRACTOR SHALL USE MATERIAL AND MAKE REPAIRS TO A CITY OF COLUMBUS STREET LIGHTING SYSTEM BY FOLLOWING DOP'S "MATERIAL AND INSTALLATION SPECIFICATIONS" (MIS) AND THE CITY OF COLUMBUS "CONSTRUCTION AND MATERIAL SPECIFICATIONS" (CMS). ANY NEW OR RE-INSTALLED STREET LIGHT SYSTEM SHALL REQUIRE TESTING AS REFERRED TO IN SECTION 1001.18 OF THE CMS. CONTRACTORS WORKING ON STREET LIGHTING SHALL CONFORM TO DOP'S EXISTING STREET LIGHT LOCKOUT/TAGOUT (LOTO) PROCEDURE, MIS-1, COPIES OF WHICH ARE AVAILABLE FROM DOP AND ON THE CITY WEBSITE.

EMERGENCIES: IF ANY ELECTRIC FACILITY BELONGING TO DOP IS DAMAGED IN ANY MANNER BY THE CONTRACTOR, ITS AGENTS, SERVANTS, OR EMPLOYEES, AND REQUIRES EMERGENCY REPAIRS, THE DOP DISPATCH OFFICE SHOULD BE CONTACTED IMMEDIATELY AT (614) 645-7627. DOP SHALL MAKE ALL NECESSARY REPAIRS, AND THE EXPENSE OF SUCH REPAIRS AND OTHER RELATED COSTS SHALL BE PAID BY THE CONTRACTOR TO THE DIVISION OF POWER, CITY OF COLUMBUS, OHIO.



EASEMENT REFERENCE		REVISIONS		
COUNTY RECORDER INSTRUMENT NUMBER	DATE RECORDED	NO.	DESCRIPTION	APPROVAL/DATE



CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER

PLAN & PROFILE

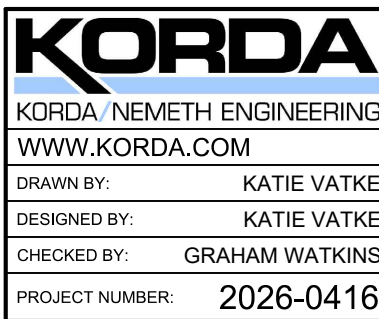
GREATER COLUMBUS CONVENTION
CENTER SECURITY IMPROVEMENTS



26-090

2
2

No.	Description	Date
GREATER COLUMBUS CONVENTION CENTER SITE SECURITY IMPROVEMENTS BID DOCUMENTS		
KORDA Korda/Nemeth Engineering, Inc. - Consulting Engineers 1650 Watermark Drive, Suite 200 - Columbus, Ohio 43215-7010 TEL 614-487-1650 - WEB www.korda.com		
WATERLINE - PLAN & PROFILE		
PROJECT NUMBER:	2026-0416	
DRAWN BY:	KEV	DATE
DESIGNED BY:	KEV	SHEET NUMBER
CHECKED BY:	GJW	09/25/2026
PROJECT NUMBER:	2026-0416	



LIGHTING SYMBOLS		
SYMBOL	DESCRIPTION	MOUNTING HEIGHT UNLESS NOTED OTHERWISE
	LUMINAIRE: TYPE "R1"; SEE LUMINAIRE SCHEDULE	----
	ARCHITECTURAL SPECIALTY LUMINAIRE: TYPE "R1"; SEE LUMINAIRE SCHEDULE	----
	EMERGENCY EGRESS LUMINAIRE: ON EMERGENCY BRANCH CIRCUIT OR WITH INTEGRAL BATTERY PACK	----
	CEILING OR WALL MOUNTED LUMINAIRE TYPE "R2", "W2"; SEE LUMINAIRE SCHEDULE	SEE DRAWINGS
	EXIT SIGN FIXTURE (WITH DIRECTIONAL ARROWS AS SHOWN) (TYPE AND MOUNTING AS NOTED; SEE LUMINAIRE SCHEDULE) SHADED AREA DENOTES FACE	94"
	EMERGENCY LIGHTING BATTERY PACK (W/INTEGRAL HEADS (TYPE AND MOUNTING AS NOTED; SEE LUMINAIRE SCHEDULE)	94"
	SITE LUMINAIRE (TYPE AND MOUNTING AS NOTED; SEE LUMINAIRE SCHEDULE)	----
	LINE VOLTAGE SWITCH 0 - OCCUPANCY SENSOR SWITCH 2 - 2-POLE 3 - 3-WAY 4 - 4-WAY D - DIMMER D3 - 3 WAY DIMMER K - KEY OPERATED M - MOMENTARY CONTACT SWITCH P - SWITCH WITH PILOT LIGHT TM - SWITCH WITH TIMER VS - VACANCY SENSOR SWITCH LT - LOW TEMPERATURE OPERATION, -4" F.	46"
	LOW VOLTAGE VACANCY SENSOR, CEILING MOUNTED	CEILING
	LOW VOLTAGE OCCUPANCY SENSOR, CEILING MOUNTED	CEILING
	LOW VOLTAGE SWITCH, 1 ZONE, 2 BUTTON, ON AND OFF	46"
	LOW VOLTAGE SWITCH AS INDICATED 2 - 2 ZONE, 4 BUTTON, ON AND OFF SC - 4 BUTTON SCENE SELECTOR	46"
	LOW VOLTAGE DIMMER, 1 ZONE, 4 BUTTON, ON, OFF, RAISE, LOWER	46"
	LOW VOLTAGE DIMMER SWITCH AS INDICATED 2 - 2 ZONE, 6 BUTTON, ON/OFF, RAISE, LOWER G - GRAPHIC USER INTERFACE SC - 4 BUTTON SCENE SELECTOR	46"

FIRE ALARM SYMBOLS		
SYMBOL	DESCRIPTION	MOUNTING HEIGHT UNLESS NOTED OTHERWISE
	COMBINATION FIRE ALARM AUDIBLE AND VISUAL DEVICE	LENS LOCATED WITHIN 80" TO 96"
	FIRE ALARM VISUAL DEVICE	LENS LOCATED WITHIN 80" TO 96"
	FIRE ALARM AUDIBLE DEVICE	≥ 90" TO TOP OF DEVICE ≥ 6" FROM CEILING TO TOP OF DEVICE
	CEILING MOUNTED COMBINATION FIRE ALARM AUDIBLE AND VISUAL DEVICE	CEILING
	CEILING MOUNTED FIRE ALARM VISUAL DEVICE	CEILING
	CEILING MOUNTED FIRE ALARM AUDIBLE DEVICE	CEILING
	FIRE ALARM MANUAL PULL STATION: K, KEY OPERATED TYPE	48"
	FIRE ALARM MAGNETIC DOOR HOLDER	72"
	FIRE ALARM FLOW SWITCH (BY DIVISION 22)	----
	FIRE ALARM TAMPER SWITCH (BY DIVISION 22)	----
	CEILING MOUNTED FIRE ALARM SMOKE DETECTOR; HEAT DETECTOR	----

POWER SYMBOLS		
SYMBOL	DESCRIPTION	MOUNTING HEIGHT UNLESS NOTED OTHERWISE
	SIMPLEX RECEPTACLE; DUPLEX RECEPTACLE; QUADRUPLX (DOUBLE DUPLEX) RECEPTACLE	18"
	DUPLEX RECEPTACLE; QUADRUPLX RECEPTACLE GROUND FAULT INTERRUPTER	46"
	DUPLEX RECEPTACLE, WITH TWO USB PORTS	18"
	RECEPTACLE FOR EQUIPMENT AS INDICATED	----
	C - CLOCK	18"
	CF - COPY/FAX MACHINE	----
	DH - DOOR HARDWARE	----
	E - GFCI RECEPTACLE FOR MECHANICAL EQUIPMENT PER NEC 210.63 (A)	----
	M - MONITOR	COORD HT
	MW - MICROWAVE	COORD HT
	TV - TELEVISION OUTLET MOUNTED IN AV BOX	SEE TECH
	WEATHERPROOF GFCI DEVICE WITH WEATHERPROOF IN-USE COVER	24"
	JUNCTION BOX, CEILING OR WALL MOUNTED	SEE DRAWINGS
	JUNCTION BOX FOR EQUIPMENT AS INDICATED	----
	DH - DOOR HARDWARE	18"
	DW - DISHWASHER	----
	EH - EXHAUST HOOD	----
	FN - SYSTEM FURNITURE	18"
	H - ELECTRIC HAND DRYER	COORD HT
	HVAC - HVAC CONTROLS	----
	KE - KITCHEN EQUIPMENT; * DENOTES EQUIPMENT NUMBER	SEE KIT DWGS
	MS - MOTORIZED SCREEN	----
	SD - SMOKE DAMPER	----
	WS - MOTORIZED WINDOW SHADES	----
	MOTORIZED SHADE CONTROLLER	COORD HT
	RECEPTACLE CABLE DROP REFER TO DETAIL X ON SHEET E-XXX	CEILING
	CORD REEL	CEILING
	SPECIAL PURPOSE RECEPTACLE (TYPE AS NOTED) OR IN SPECIFICATIONS)	SEE DRAWINGS
	SPECIAL PURPOSE RECEPTACLE FOR EQUIPMENT AS INDICATED	----
	CD - NEMA 14-30R; CLOTHES DRYER	34"
	RA - NEMA 6-30R; RANGE	4"
	CONTROL TRANSFORMER FOR AUTOMATIC FAUCET / FLUSH VALVE, MOUNTED ABOVE CEILING. PROVIDE 120V POWER CONNECTION AND TOGGLE DISCONNECT SWITCH.	----
	AUTOMATIC DOOR OPERATOR 120V 1Ø. PROVIDE WIRING TO PULSEDRAIN	COORD HT
	AUTOMATIC DOOR OPERATOR PUSHBUTTON	----
	HAND WAVE AUTOMATIC DOOR OPERATOR	----
	SINGLE SERVICE PRE-WIRED MULTIPLE OUTLET RACEWAY	SEE DRAWINGS
	DUAL SERVICE FIELD WIRED MULTIPLE OUTLET RACEWAY	SEE DRAWINGS
	MOTOR (BY DIVISION 1-25)	----
	MANUAL MOTOR STARTER	46"
	TOGGLE DISCONNECT SWITCH	46"
	SWITCH FURNISHED BY OTHERS FOR EQUIPMENT AS INDICATED	46"
	MS - MOTORIZED SCREEN	----
	SAFETY SWITCH (SWITCH SIZE, FUSE SIZE, NO. OF POLES -AS NOTED) *3R* DENOTES NEMA *3R* ENCLOSURE, *NF* DENOTES NONFUSED	60"
	COMBINATION MOTOR STARTER (STARTER SIZE, FUSE SIZE, NO. OF POLES -AS NOTED) *3R* DENOTES NEMA *3R* ENCLOSURE *NF* DENOTES NONFUSED	60"
	MAGNETIC MOTOR STARTER (STARTER SIZE NO. OF POLES -AS NOTED) *3R* DENOTES NEMA *3R* ENCLOSURE *NF* DENOTES NONFUSED	60"
	PUSHBUTTON STATION	46"
	CONTROL PANEL	SEE DRAWINGS
	VARIABLE FREQUENCY DRIVE	SEE DRAWINGS
	VOICE/DATA TERMINAL BOARD	60"
	PANELBOARD: SURFACE MOUNTED, FLUSH MOUNTED PANEL DESIGNATION AS SHOWN	72"
	DISTRIBUTION PANELBOARD	----
	CONDUIT, RISER UP	----
	CONDUIT, RISER DOWN	----
	CONDUIT ROUTED UNDER FLOORSPACE OR UNDERGROUND	----
	HOME RUN BRANCH CIRCUIT (OVERHEAD)	----
	HOME RUN BRANCH CIRCUIT (UNDERFLOOR)	----
	FLEXIBLE CONDUIT OR CABLE	----
	TRANSFORMER: (SIZE AS NOTED OR IN TRANSFORMER SCHEDULE)	SEE DRAWINGS
	POWER SUPPLY	----

- POWER GENERAL NOTES**
APPLIES TO EACH POWER DRAWING
- REFER TO DRAWINGS AND SPECIFICATIONS OF OTHER CONSTRUCTION TRADES FOR ADDITIONAL ELECTRICAL WORK INCLUDED IN THIS CONTRACT.
 - COORDINATE EXACT LOCATIONS OF EQUIPMENT WITH OTHER CONSTRUCTION TRADES. VERIFY EXACT WIRING AND CONNECTION REQUIREMENTS WITH SUBMITTAL DOCUMENTS BEFORE INSTALLATION. SPECIALTY OUTLET TYPES SHALL BE VERIFIED BEFORE ORDERING. ALL ELECTRICAL WORK SHOWN HERE MUST BE VERIFIED AND COORDINATED IN FIELD BEFORE INSTALLATION.
 - ALL DEVICES SHOWN ON THE EXTERIOR OF THE BUILDING SHALL BE WEATHERPROOF TYPE. ALL WEATHERPROOF RECEPTACLES HAVE WHILE-IN-USE COVERS UNLESS NOTED OTHERWISE.
 - PROVIDE ALL FINAL POWER CONNECTIONS TO EQUIPMENT. PROVIDE ALL CONDUIT, DEVICE BOXES, AND CONTROL WIRING TO EQUIPMENT UNLESS NOTED OTHERWISE.
 - CIRCUIT NUMBER INDICATED WITH "GF" IS A CIRCUIT PROTECTED BY GROUND FAULT INTERRUPTING CIRCUIT BREAKER.
 - GFCI DEVICES SHALL BE LOCATED SO THEY ARE CONSIDERED "ACCESSIBLE". PROVIDE GFCI TYPE CIRCUIT BREAKERS OTHERWISE.

- DEMOLITION GENERAL NOTES**
APPLIES TO EACH DEMOLITION DRAWING
- TURN OVER ANY SALVAGEABLE EQUIPMENT.
 - COORDINATE EXACT EXTENT OF DEMOLITION WITH ARCHITECTURAL DEMOLITION DRAWINGS.
 - COORDINATE PHASING OF DEMOLITION AND CONSTRUCTION PER DRAWINGS.
 - REMOVE ALL LIGHTING FIXTURES, DEVICES, OUTLETS, CONDUIT, CABLING, PANELS, AND EQUIPMENT WITHIN AREAS OF DEMOLITION. REMOVE WIRING AND CONDUIT BACK TO SOURCE OR LAST POINT OF CONNECTION TO REMAIN.
 - EXISTING EQUIPMENT OUTSIDE OF SCOPE OF WORK BOUNDARIES SHALL BE MAINTAINED. RECONNECT ANY CIRCUITS CUT PASSING THROUGH DEMOLITION AREAS.
 - REMOVE ALL UNUSED WIRING AND CABLES BACK TO THEIR SOURCE. REMOVE ALL UNUSED CONDUIT THAT IS EXPOSED OR ABOVE ACCESSIBLE CEILINGS WHICH IS AFFECTED BY OR IS IN THE AREA OF THE DEMOLITION WORK.
 - THE INTENTION OF THE ELECTRICAL DEMOLITION DRAWINGS IS TO DISCONNECT AND REMOVE ALL ELECTRICAL WORK MADE VOID BY THE SCOPE OF THE CONSTRUCTION AND ALTERATION. FIELD VERIFY EXACT MATERIAL QUANTITIES REQUIRED TO BE REMOVED.
 - WHERE BURIED CONDUITS EXTENDING OUT OF A CONCRETE SLAB BECOME ABANDONED, CUT AND GRIND THE CONDUITS OFF FLUSH WITH TOP OF SLAB AND PLUG WITH NON-SHRINK WATERPROOF GROUT FILL.
 - COORDINATE ALL DEMOLITION WORK WITH ALL OTHER TRADES.
 - LEGALLY DISPOSE OF HAZARDOUS MATERIALS AND BALLAST OR OTHER EQUIPMENT CONTAINING PCBs AND LAMPS CONTAINING MERCURY. COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS.

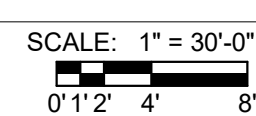
BRANCH CIRCUIT GENERAL NOTE		
1. BRANCH CIRCUIT CONDUIT ROUTING IS NOT SHOWN ON THE PLANS AND LEFT TO THE DISCRETION OF THE CONTRACTOR. BRANCH CIRCUIT WIRE SIZE SHALL BE AS FOLLOWS BASED ON CONDUIT ROUTE LENGTHS, BEFORE WIRING INSTALLATION. VERIFY THAT THE FURTHEST DISTANCE FROM PANELBOARD TO OUTLET DOES NOT EXCEED THE FOLLOWING DISTANCE FOR WIRE SIZE SHOWN. INCREASE WIRE SIZE APPROPRIATELY FOR FARTHER DISTANCES.		
CONDUCTOR SIZE	MAXIMUM LENGTH	
#12 AWG	100 FEET	
#10 AWG	150 FEET	
#8 AWG	250 FEET	
#6 AWG	400 FEET	

ELECTRICAL ABBREVIATIONS	
ABBREVIATIONS USED ON DRAWINGS IN GENERAL ARE LISTED BELOW. REFER TO CSI DOCUMENT TD-2.4 FOR ANY ABBREVIATIONS LISTED ON THE DRAWINGS BUT ARE NOT LISTED BELOW.	
A	AMPS
AC	AIR COMPRESSOR
AF	ARC FLASH CIRCUIT INTERRUPTER DEVICE
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AHU	AIR HANDLER UNIT
BRKR	BREAKER
C	CONDUIT
CATV	CABLE ANTENNA TELEVISION
CCTV	CLOSED CIRCUIT TELEVISION
CUH	CABINET UNIT HEATER
OKT	CIRCUIT
CPT	CONTROL POWER TRANSFORMER
CU	COPPER
DISTR	DISTRIBUTION
DLH	DAYLIGHT HARVESTING
EF	EXHAUST FAN
ELEC	ELECTRICAL
EM	EMERGENCY
EMT	ELECTRICAL METALIC TUBING
EPO	EMERGENCY POWER OFF
EVSE	ELECTRIC VEHICLE SERVICE EQUIPMENT (CHARGER)
EWV	ELECTRIC WATER COOLER
EX	EXISTING
EXP	EXPLOSION PROOF TYPE DEVICE.
F	FUSE
FAA	FIRE ALARM ANNUNCIATOR.
FACP	FIRE ALARM CONTROL PANEL
FAP	FIRE ALARM PANEL
FARA	FIRE ALARM REMOTE ANNUNCIATOR
FC	FAN COIL UNIT
FIXT	LIGHT FIXTURE
FLOUR	FLUORESCENT
FLR	FLOOR
FS	FUSIBLE SWITCH
G	GROUND
GRC	GALVANIZED RIGID CONDUIT
GF	GROUND FAULT INTERRUPTER DEVICE
HD	HIGH INTENSITY DISCHARGE
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HP	HORSEPOWER
IT	INFORMATION TECHNOLOGY
J	JUNCTION BOX
KEC	KITCHEN EQUIPMENT CONTRACTOR
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KW	KILOWATTS
LC	LIGHTING CONTACTOR
LGT	LIGHTING
LV	LOW VOLTAGE
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MSB	MAIN SWITCHBOARD
MOUNTD	MOUNTED
+N	INDICATES MOUNTING HEIGHT (N) TO CENTER OF DEVICE FROM FINISH FLOOR UNLESS OTHERWISE NOTED
NIC	NOT IN CONTRACT
NL	NIGHTLIGHT
NTS	NOT TO SCALE
OC OR O/C	ON CENTER
OH	OVERHEAD
P	POLE (PHASE)
PVC	POLYVINYL CHLORIDE
PE	PNEUMATIC/ ELECTRIC
PNL	PANEL
Ø OR P	PHASE
RAF	RETURN AIR FAN
RTU	ROOFTOP UNIT
SH	SHUNT TRIP
SW	SWITCH
TCF	TEMPERATURE CONTROL PANEL
TFMR	TRANSFORMER
TR	TAMPER RESISTANT
TV	TELEVISION
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
V	VOLTS
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
VIF	VERIFY IN FIELD
VC	VOLUME CONTROL
W	WATTS
WP	WEATHERPROOF TYPE DEVICE
1/E.1	MEANS DETAIL No. 1, DRAWING SHEET "E1"

- SYMBOL LIST GENERAL INFORMATION**
- SOME SYMBOLS MAY NOT BE USED.
 - MOUNTING HEIGHTS ARE TO CENTER OF DEVICE UNLESS NOTED OTHERWISE.
 - STRAIGHT LINES BETWEEN DEVICES INDICATE CONTROLLED CIRCUIT.
 - DASHED SYMBOLS INDICATE EXISTING DEVICES TO BE REMOVED.
 - SOLID SYMBOLS WITH LIGHT LINEWEIGHT INDICATE EXISTING DEVICES TO REMAIN.
 - DASHED SYMBOLS WITH SUBSCRIPT "RL" INDICATE EXISTING DEVICES TO BE RELOCATED.
 - SOLID SYMBOLS WITH SUBSCRIPT "RD" INDICATE RELOCATED DEVICES.
- DEVICE SUFFIXES**
- | | |
|----|--------------------------|
| AC | ABOVE COUNTER |
| C | CEILING MOUNTED OUTLET |
| F | FLOOR MOUNTED OUTLET |
| S | SURFACE RACEWAY OUTLET |
| M | MODULAR FURNITURE OUTLET |
| W | WALL MOUNTED |
| WG | WIRE GUARD |
| WP | WEATHER PROOF |

ELECTRICAL SHEET INDEX	
SHEET NUMBER	SHEET NAME
E0.0	ELECTRICAL SYMBOLS AND LEGENDS
E0.1	ELECTRICAL SITE PLAN - DEMO
E0.2	ELECTRICAL SITE PLAN - NEW WORK
E4.1	EXISTING ELECTRICAL ROOMS
E5.1	ELECTRICAL SCHEDULES
E7.1	ELECTRICAL DETAILS

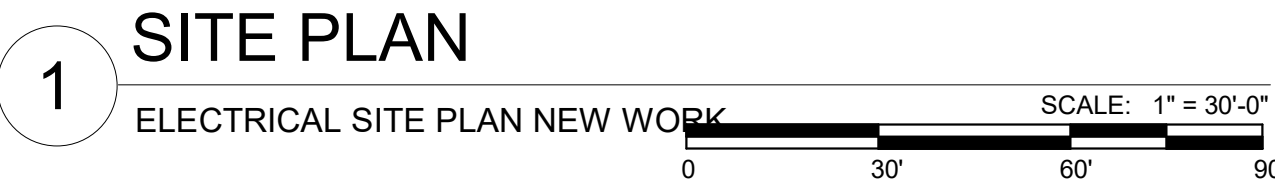
No.	Description	Date
GREATER COLUMBUS CONVENTION CENTER SITE SECURITY IMPROVEMENTS BID DOCUMENTS		
KORDA Korda/Nemeth Engineering, Inc. Consulting Engineers 1650 Westmark Drive, Suite 200 • Columbus, Ohio 43215-7010 TEL 614-487-1650 • WEB www.korda.com		
ELECTRICAL SYMBOLS AND LEGENDS		
PROJECT STATUS: Project Status		
PROJECT NUMBER: 2026-0416		
NOT FOR CONSTRUCTION WORKING DRAWINGS FOR REVIEW	DRAWN BY: Jacob L. Ruby	DATE
	DESIGNED BY: Dustin J. Ruby	SHEET NUMBER
	CHECKED BY: Stanley J. Kmonk	09/25/2026
		E0.0



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| No. | Description | Date | |
| GREATER COLUMBUS CONVENTION CENTER
SITE SECURITY IMPROVEMENTS

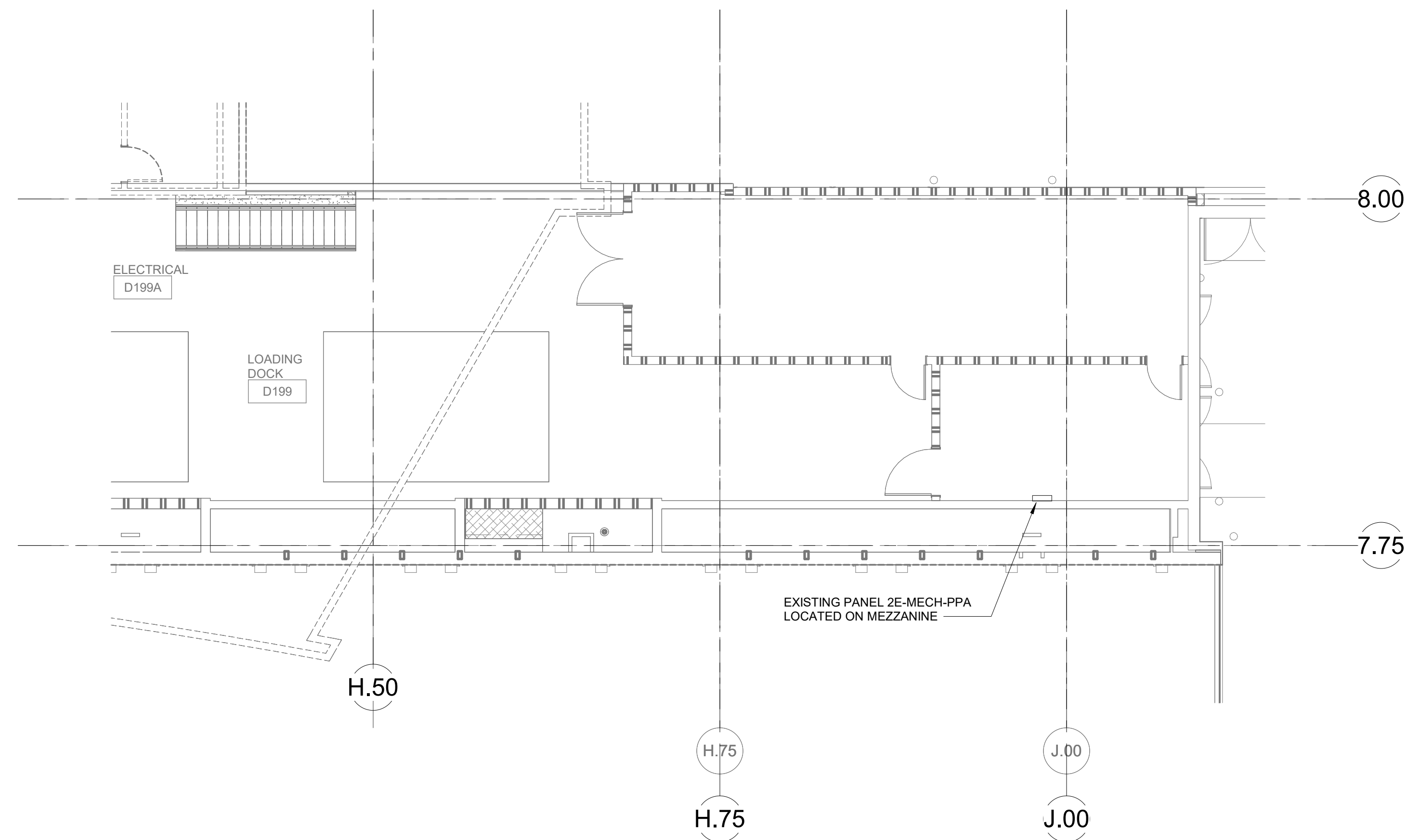
BID DOCUMENTS | | | |
|  | | | |
| <small>Korda/Nemeth Engineering, Inc. - Consulting Engineers
1650 Watermark Drive, Suite 200 - Columbus, Ohio 43216-7010
TEL 614-487-1050 - WEB www.korda.com</small> | | | |
| ELECTRICAL SITE PLAN - DEMO | | | |
| PROJECT STATUS: | | Project Status | |
| PROJECT NUMBER: | | 2025-0416 | |
| DRAWN BY: | Jacob L. Ruby | DATE | SHEET NUMBER |
| DESIGNED BY: | Dustin J. Ruby | 09/25/2026 | E0.1 |
| CHECKED BY: | Stanley J. Kmonk | | |

PROJECT NUMBER:		2026-0416	
N	DRAWN BY: Jacob L. Ruby	DATE	SHEET NUMBER
	DESIGNED BY: Dustin J. Ruby	09/25/2026	E0.1
	CHECKED BY: Stanley J. Kmonk		



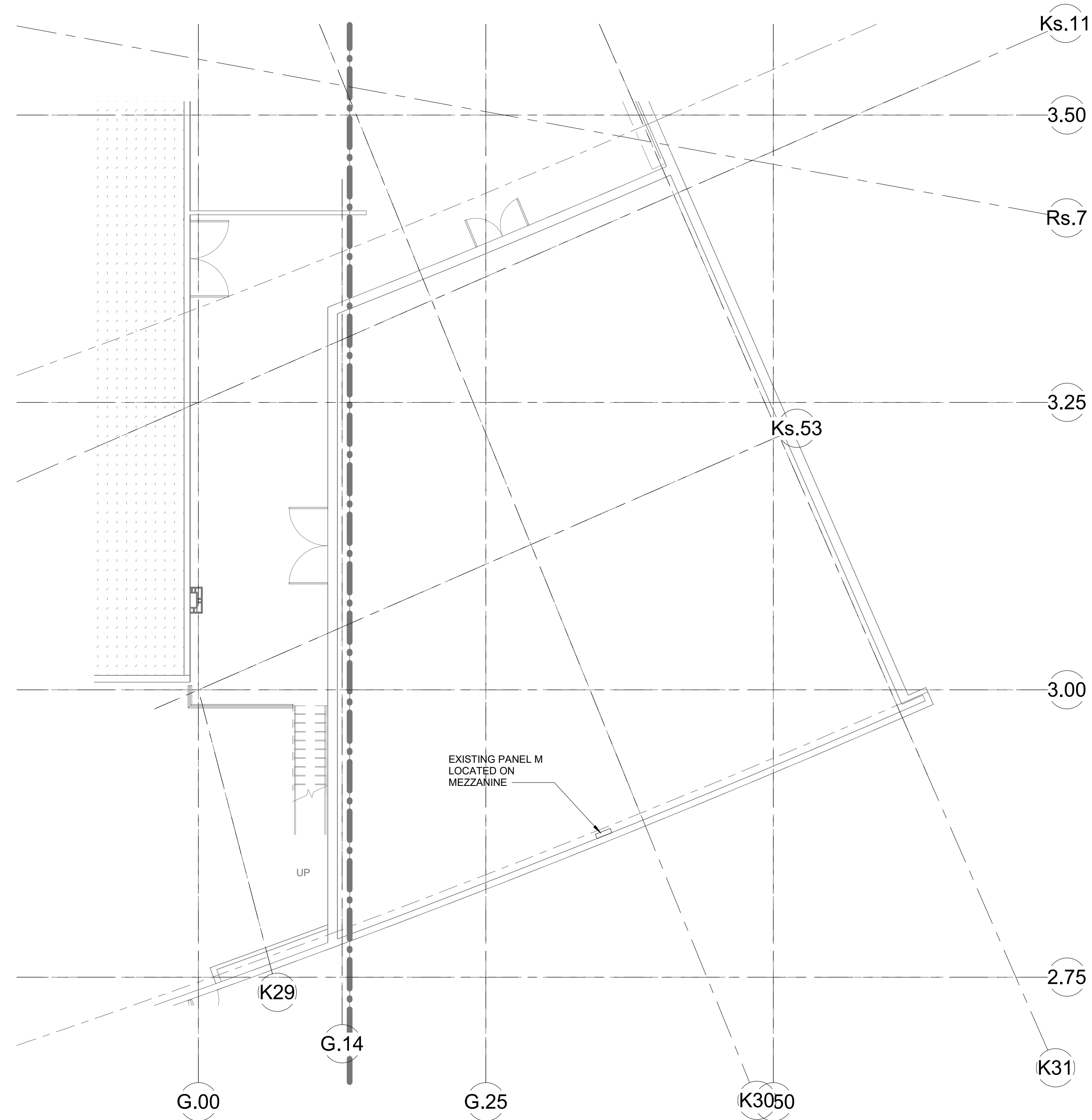
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| No. | Description | Date |
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 SITE SECURITY IMPROVEMENTS
 BID DOCUMENTS</p> | | |
|  <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> <p>Korda/Nemeth Engineering, Inc. - Consulting Engineers
 1650 Watermark Drive, Suite 200 - Columbus, Ohio 43215-7010
 TEL 614 -487 -1650 - WEB www.korda.com</p> </div> | | |
| <p align="center">ELECTRICAL SITE PLAN - NEW WORK</p> | | |
| PROJECT STATUS: | | Project Status |
| PROJECT NUMBER: | | 2026-0416 |
| DRAWN BY: Jacob L. Ruby | DATE | SHEET NUMBER |
| DESIGNED BY: Dustin J. Ruby | 09/25/2026 | E0.2 |
| CHECKED BY: Stanley J. Kmonk | | |

**NOT FOR
CONSTRUCTION**



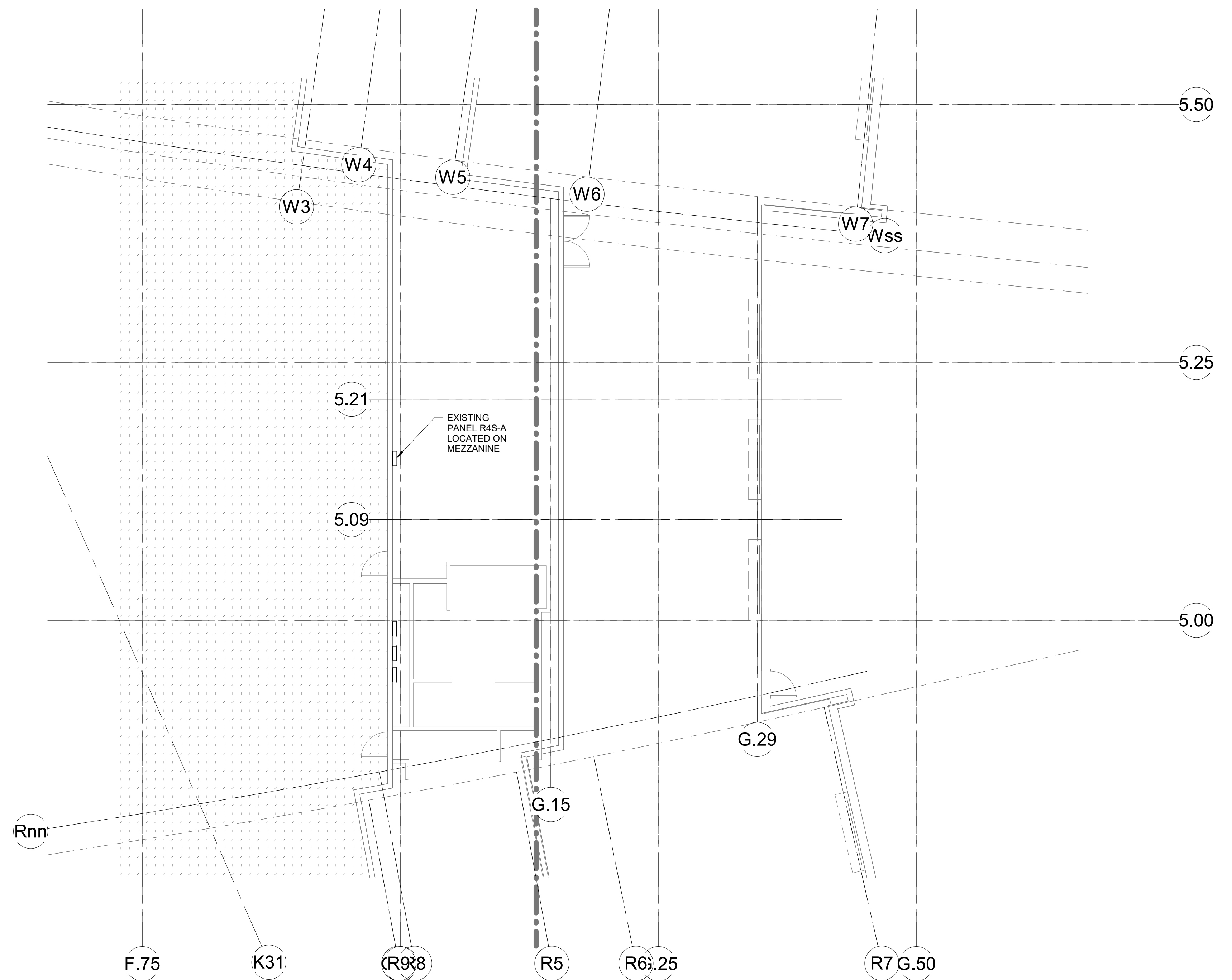
1 FLOOR PLAN
NORTH ELECTRICAL ROOM

SCALE: 1/8" = 1'-0"
0' 1' 2' 4' 8'



3 FLOOR PLAN
SOUTH ELECTRICAL ROOM

SCALE: 1/8" = 1'-0"
0' 1' 2' 4' 8'



2 FLOOR PLAN
CENTRAL ELECTRICAL ROOM

SCALE: 1/8" = 1'-0"
0' 1' 2' 4' 8'

No.			Description	Date
GREATER COLUMBUS CONVENTION CENTER SITE SECURITY IMPROVEMENTS BID DOCUMENTS				
KORDA Korda/Nemeth Engineering, Inc. Consulting Engineers 1650 Watermark Drive, Suite 200 Columbus, Ohio 43215-7010 TEL 614-487-1650 • WEB www.korda.com				
EXISTING ELECTRICAL ROOMS				
PROJECT STATUS:			Project Status	
PROJECT NUMBER:			2026-0416	
DRAWN BY: Jacob L. Ruby			DATE	SHEET NUMBER
DESIGNED BY: Dustin J. Ruby			09/25/2026	E4.1
CHECKED BY: Stanley J. Kmonk				

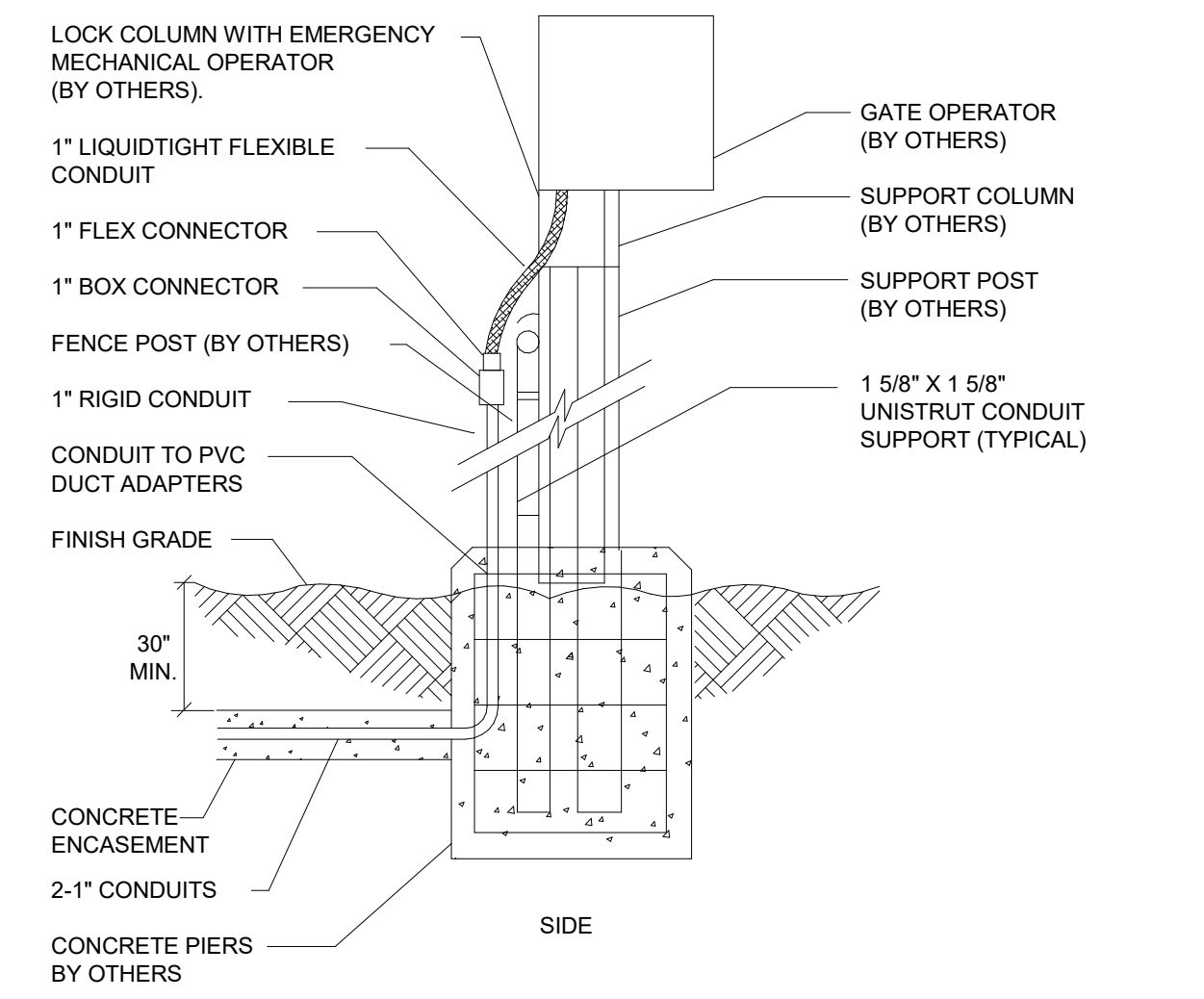
NOT FOR
CONSTRUCTION
WORKING DRAWINGS
FOR REVIEW

Panel Name: 2E-MECH-PPA												
Location: ELECTRICAL D297			Volts: 120/208 Wye			Mains Type: MCB			225.00 A			
Supply From: Recessed			Phases: 3			Mains Rating: 225.00 A			225.00 A			
Mounting: Recessed			Wires: 4			Notes:						
Legend:												
Note	Custo in Wire Size	Branch Circuit Description	Trip	#	A	B	C	#	Trip	Branch Circuit Description	Custo in Wire Size	Note
--	--	(E)SE OVERHEAD DOOR	20 A	13	1/0.5	1/0.5	--	2	20 A	(E)CRP-3	--	--
--	--	GATE POWER NE MEZZANINE	20 A	5	--	0/0.5	--	4	20 A	(E)JH LOADING DOCK WEST	--	--
--	--	(E)JH-11 SECURITY CABINET	20 A	7	0.5/0.5	--	--	8	20 A	(E)JH-10	--	--
--	--	(E)EX HALL HEATERS	20 A	9	--	0.5/0	--	10	20 A	(E)SPARE	--	--
--	--	(E)SPARE	20 A	11	--	--	0/0	12	20 A	(E)SPARE	--	--
--	--	(E)SPARE	20 A	13	0/0.5	--	--	14	20 A	(E)D295 RECEPTACLE	--	--
--	--	(E)D295 RECEPTACLE	20 A	15	--	0.5/0	--	16	20 A	(E)SPARE	--	--
--	--	(E)D295 RECEPTACLE	20 A	17	--	0.5/0.5	--	18	20 A	(E)LOAD	--	--
--	--	(E)EF-6	20 A	19,21	1/0.5	--	--	20	20 A	(E)D295 RECEPTACLE	--	--
--	--	(E)EF-9	20 A	23	--	1/0.5	--	22	20 A	(E)JH-12	--	--
--	--	(E)EF-8	20 A	25	0.5/0.5	--	0.5/0.5	24	20 A	(E)LOAD	--	--
--	--	(E)JAHU-13.14 LIGHTS & REC	20 A	27	--	0.5/0.5	--	26	20 A	(E)LOAD	--	--
--	--	(E)JAHU-12 LIGHTS & REC	20 A	29	--	0.5/0.5	--	30	20 A	(E)LOAD	--	--
--	--	(E)SPARE	20 A	31	0/0	--	--	32	20 A	(E)SPARE	--	--
--	--	(E)CRP-4	30 A	33	--	0.5/0.5	--	34	20 A	(E)TEMP CONTROL	--	--
--	--	(E)CRP-5	30 A	35	--	0.5/0	--	36	20 A	(E)SPARE	--	--
--	--	SPACE	--	37	0/0	--	--	38	--	SPACE	--	--
--	--	SPACE	--	39	--	0/0	--	40	--	SPACE	--	--
--	--	SPACE	--	41	--	--	0/0	42	--	SPACE	--	--
Phase Total KVA:					5.50	6.00	4.00					
Phase Total Amps:					47.76	51.92	33.33					
Load Classification		Connected Load	NEC Demand Factor		NEC Demand		Panel Summary					
LIGHTING		0.00 kVA	0.00%		0.00 kVA							
RECEPTACLE & MISC		0.00 kVA	0.00%		0.00 kVA		Total Conn. Load: 15.50 kVA					
MOTOR		0.00 kVA	0.00%		0.00 kVA		Total Est. Demand: 15.50 kVA					
HEATING		0.00 kVA	0.00%		0.00 kVA		Total Conn.: 43.02 A					
EXISTING		15.50 kVA	100.00%		15.50 kVA		Total Est. Demand: 43.02 A					

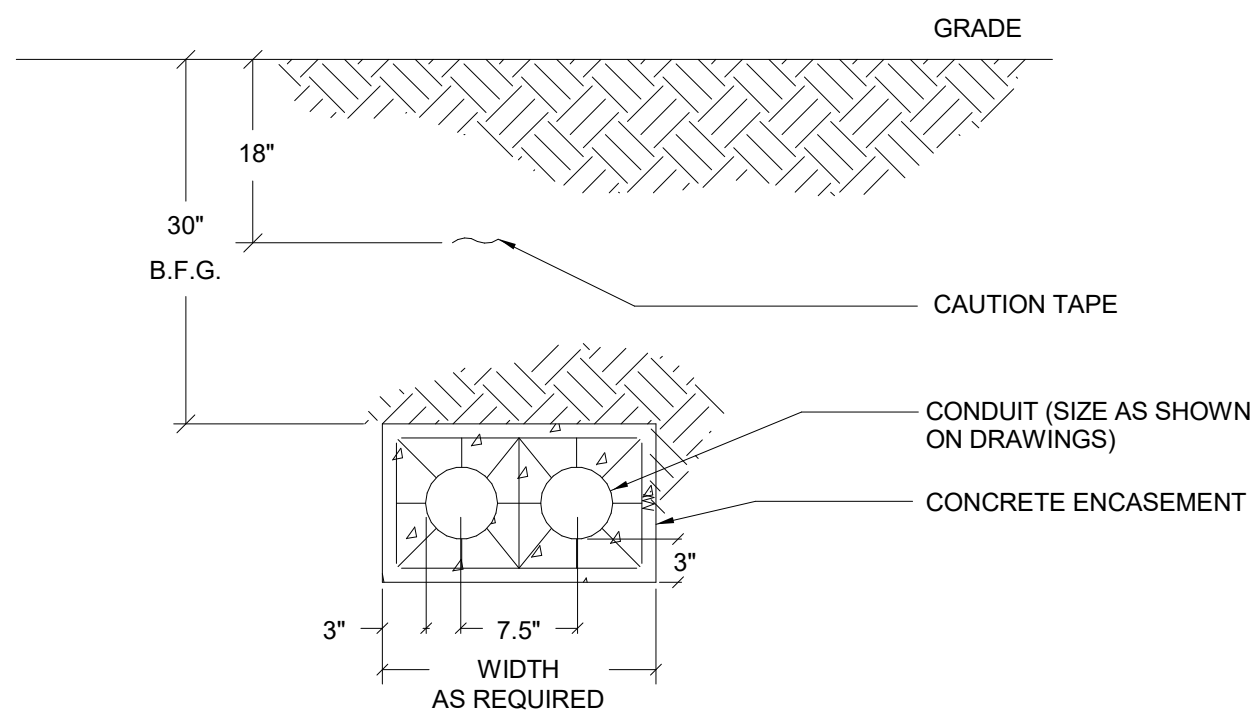
Panel Name: M												
Location: Supply From: Mounting: Legend:			Volts: 120/208 Wye Phases: 3 Wires: 4 Notes:			Mains Type: 120/208 Wye Mains Rating: 60.00 A MCB Rating: 125.00 A						
Note	Custo in Wire Size	Branch Circuit Description	Trip	#	A	B	C	#	Trip	Branch Circuit Description	Custo in Wire Size	Note
--	--	(E)GAS MONITOR SYSTEM 1ST FLOOR	20 A	1	0.5/1			2,4	20 A	(E)AIR COMPRESSOR	--	--
--	--	(E)SPARE	20 A		3,5,7	0/1		6	20 A	(E)TEMP CONTROL PANEL 1ST FLOOR	--	--
--	--	(E)HEAT TRACE 2ND FLOOR	50 A	9,11	0/0.5	0.5/0.5		10	20 A	(E)TEMP CONTROL PANEL 2ND FLOOR	--	--
--	--	(E)LOADING DOCK HEAT TRACE	20 A	13	0.5/1		0/1	12,14	20 A	(E)BOILER CONTROL PANEL	--	--
86	--	GATE POWER SOUTH MEZZANINE	20 A	15	1/0	1/0		16	--	SPACE	--	--
--	--	SPACE	--	17	--	--	0/0	18	--	SPACE	--	--
--	--	SPACE	--	19	0/0	--	--	20	--	SPACE	--	--
--	--	(E)MCB	60 A	21,23,25	--	0/0	0/0	22	--	--	--	--
					0/0		0/0	24	--	--	--	--
Phase Total KVA:			3.50	3.00	1.50							
Phase Total Amps:			31.09	26.92	12.50							
Load Classification		Connected Load	NEC Demand Factor		NEC Demand		Panel Summary					
LIGHTING		0.00 kVA	0.00%		0.00 kVA							
RECEPTACLE & MISC		0.50 kVA	100.00%		0.50 kVA		Total Conn. Load: 8.00 kVA					
MOTOR		0.50 kVA	125.00%		0.63 kVA		Total Est. Demand: 8.13 kVA					
HEATING		0.00 kVA	0.00%		0.00 kVA		Total Conn.: 22.21 A					
EXISTING		7.00 kVA	100.00%		7.00 kVA		Total Est. Demand: 22.55 A					

Panel Name: R4S-A												
Location: Supply From: Mounting: Legend:			Volts: 120/208 Wye Phases: 3 Wires: 4 Notes:			Mains Type: MCB Mains Rating: 225.00 A MCB Rating: 225.00 A						
Note	Custo in Wire Size	Branch Circuit Description	Trip	#	A	B	C	#	Trip	Branch Circuit Description	Custo in Wire Size	Note
--	--	(E)TEMP CON. CAB RM 1136	20 A	1	0.5/0.5	--	--	2	20 A	(E)TEMP CON. CAB RM 1136	--	--
--	--	(E)TEMP CON. CAB RM 1136	20 A	3	--	0.5/0.5	--	4	20 A	(E)TEMP CON. CAB RM 1136	--	--
--	--	(E)TEMP CON. CAB RM 1136	20 A	5	--	--	0.5/0.5	6	20 A	(E)LOAD	--	--
--	--	(E)FUEL TANK MONITOR	20 A	7	0.5/0.5	--	--	8	20 A	(E)PAY TELEPHONES	--	--
--	--	(E)LOAD	20 A	9	--	0.5/1	--	10	30 A	(E)GENERATOR BLOCK HEATER	--	--
--	--	(E)CHEM FEED TRAP PRIM	20 A	11	--	--	0.5/1	12	40 A	(E)HEAT SECURITY OFFICE	--	--
--	--	(E)EF15	20 A	13	0.5/1	--	--	14	30 A	(E)AIR CONDITIONER SECURITY	--	--
--	--	(E)EF16	20 A	15	--	0.5/1	--	16	--	--	--	--
--	--	SPACE	--	17	--	--	0.1	18,20	--	--	--	--
#10	--	GATE LOAD CENTER	100 A	--	19,21,23	8,33/1	--	22	--	SPACE	--	--
--	--	SPACE	--	25	0/0	--	8,33/0	24	--	SPACE	--	--
--	--	SPACE	--	27	--	0/0	--	28	--	SPACE	--	--
--	--	SPACE	--	29	--	--	0/0	30	--	SPACE	--	--
--	--	(E)HAND DRYER WOMANS RR	20 A	31	0.5/0.5	--	--	32	20 A	(E)LOAD	--	--
--	--	(E)HAND DRYER WOMANS RR	20 A	33	--	0.5/0.5	--	34	20 A	(E)SPRINT DAS FBDA 13.14	--	--
--	--	(E)HAND DRYER MENS RR	20 A	35	--	--	0.5/0.5	36	20 A	(E)LOAD	--	--
--	--	(E)UNIT HEATER RM 1132	20 A	37	0.5/0.5	--	--	38	20 A	(E)LOAD	--	--
--	--	(E)UNIT HEATER RM 1136	20 A	39	--	0.5/1	--	40,42	20 A	(E)REAR SHOW OFFICE HEATER	--	--
--	--	(E)UNIT HEATER RM 1516	20 A	41	--	--	0.5/1	--	--	--	--	--
Phase Total KVA:					14.83	14.83	14.33					
Phase Total Amps:					124.25	124.25	119.44					
Load Classification		Connected Load	NEC Demand Factor		NEC Demand		Panel Summary					
LIGHTING		0.00 kVA	0.00%		0.00 kVA							
RECEPTACLE & MISC		0.00 kVA	0.00 kVA		0.00 kVA		Total Conn. Load: 44.00 kVA					
MOTOR		25.00 kVA	125.00%		31.25 kVA		Total Est. Demand: 50.25 kVA					
HEATING		0.00 kVA	0.00%		0.00 kVA		Total Conn.: 122.13 A					
EXISTING		19.00 kVA	100.00%		19.00 kVA		Total Est. Demand: 139.48 A					

Panel Name: GH												
Location: 120/208 Wye			Volts: 120/208 Wye			Mains Type: MCB			100.00 A			
Supply From: Surface			Phases: 3			Mains Rating: 100.00 A			100.00 A			
Mounting: Surface			Wires: 4			MCB Rating:						
Legend:			Notes:									
Note	Custo in Wire Size	Branch Circuit Description	Trip	#	A	B	C	#	Trip	Branch Circuit Description	Custo in Wire Size	Note
--	--	HEAT TRACE GATE HOUSE	50 A	1,3,5	1/0.5	1/0.5	--	2	20 A	RECEPTACLE GATE HOUSE	--	--
--	--		40 A	--	--	--	--	4	20 A	LTG GATE HOUSE	--	--
#12	--	GATE POWER CENTER MEZZANINE	20 A	7	0/1	--	--	10	20 A	A/C UNIT GATE HOUSE	--	--
#12	--	CARD READER POWER	20 A	9	1/0	1/0	--	10	20 A	SPARE	--	--
--	--	SPARE	20 A	11	--	0/0	0/0	12	20 A	SPARE	--	--
--	--	SPARE	20 A	13	0/0	--	--	14	20 A	SPARE	--	--
--	--	SPARE	20 A	15	--	0/0	--	16	20 A	SPARE	--	--
--	--	SPARE	20 A	17	--	0/0	0/0	18	20 A	SPARE	--	--
--	--	SPARE	20 A	19	0/0	--	--	20	20 A	SPARE	--	--
--	--	SPARE	20 A	21	--	0/0	--	22	20 A	SPARE	--	--
--	--	SPARE	20 A	23	--	0/0	0/0	24	20 A	SPARE	--	--
--	--	SPARE	20 A	25	0/0	--	--	26	20 A	SPARE	--	--
--	--	SPARE	20 A	27	--	0/0	--	28	20 A	SPARE	--	--
--	--	SPARE	20 A	29	--	0/0	0/0	30	20 A	SPARE	--	--
Phase Total KVA:					2.50	2.50	2.00					
Phase Total Amps:					21.47	21.47	16.67					
Load Classification	Connected Load	NEC Demand Factor	NEC Demand			Panel Summary						
LIGHTING	0.00 kVA	0.00%	0.00 kVA									
RECEPTACLE & MISC	1.00 kVA	100.00%	1.00 kVA			Total Conn. Load: 7.00 kVA						
MOTOR	0.00 kVA	0.00%	0.00 kVA			Total Est. Demand: 7.00 kVA						
HEATING	0.00 kVA	0.00%	0.00 kVA			Total Conn.: 19.43 A						
EXISTING	6.00 kVA	100.00%	6.00 kVA			Total Est. Demand: 19.43 A						



1 DETAIL
VEHICLE GATE WIRING INSTALLATION N.T.S.



2 DETAIL
DUCTBANK SECTION N.T.S.

No.	Description	Date
GREATER COLUMBUS CONVENTION CENTER SITE SECURITY IMPROVEMENTS BID DOCUMENTS		
KORDA Korda/Nemeth Engineering, Inc. Consulting Engineers 1650 Watermark Drive, Suite 200 Columbus, Ohio 43215-7010 TEL 614-487-1650 • WEB www.korda.com		
ELECTRICAL DETAILS		
PROJECT STATUS:		Project Status
PROJECT NUMBER:		2026-0416
NOT FOR CONSTRUCTION	DRAWN BY: Jacob L. Ruby	DATE
	DESIGNED BY: Dustin J. Ruby	SHEET NUMBER
	WORKING DRAWINGS FOR REVIEW	09/25/2026
CHECKED BY: Stanley J. Kmonk		E7.1



No.	Description	Date	
GREATER COLUMBUS CONVENTION CENTER SITE SECURITY IMPROVEMENTS			
BID DOCUMENTS			
 Korda/Nemeth Engineering, Inc. - Consulting Engineers 1050 Watermark Drive, Suite 200 - Columbus, Ohio 43215-7010 TEL 614-457-1050 - WEB www.korda.com			
GUARD BOOTH DETAILS			
PROJECT NUMBER:		2026-0416	
DRAWN BY:		DATE	SHEET NUMBER
DESIGNED BY:		09/25/2026	SP 1.0
CHECKED BY:			

AAC ABOVE ACCESSIBLE CEILING
 ABE ABOVE FINISH FLOOR
 AFG ABOVE FINISH GRADE
 AHA AUTHORITY HAVING JURISDICTION
 ANSI AMERICAN NATIONAL STANDARDS INSTITUTE
 APC ANCHORED POLISHED CONNECTOR
 AV AUDIO VISUAL
 AVG AMERICAN VIRE GAUGE
 BAS BUILDING AUTOMATION SYSTEM
 BC BONDING CONDUCTOR
 BCT BONDING CONDUCTOR FOR TELECOMMUNICATIONS
 BOB BOV FINISH GRADE
 BICI BUILDING INDUSTRY CONSULTING SERVICE INTERNATIONAL
 BIMS BUILDING MANAGEMENT SYSTEM
 CAD COMPUTER-AIDED DESIGN
 CAT CATEGORY
 CATV COMMUNITY ANTENNA TELEVISION (CABLE TELEVISION)
 CC CONCENTRIC CABLE TELEVISION
 CM COMMUNICATIONS GENERAL-PURPOSE CABLE
 CMP COMMUNICATIONS PLENUM CABLE
 CMR COMMUNICATIONS RISER CABLE
 COAX COAXIAL CABLE
 CP CONSOLIDATION POINT
 CPE CUSTOMER PREMISES EQUIPMENT
 CRAS COMPUTER ROOM AIR CONDITIONING
 CSCI CONSTRUCTION SPECIFICATIONS INSTITUTE
 DAS DISTRIBUTED ANTENNA SYSTEM
 DC DECEMBER
 dBmV DECIBEL MILLIVOLT
 DVR DIGITAL VIDEO RECORDER
 EF ENTRANCE FACILITY
 ER EQUIPMENT ROOM
 FTI FOIL TWISTED-PAIR
 GC GENERAL CONTRACTOR
 GE GROUNDING EQUALIZER
 GEI GROUNDING EQUALIZER CONDUCTOR
 HC HORIZONTAL CROSS-CONNECT
 HD HIGH DEFINITION MULTIMEDIA INTERFACE
 HH HANDLE
 HVAC HEATING, VENTILATING, AND AIR CONDITIONING
 IC INTERMEDIATE CROSS-CONNECT
 ID INSIDE DIAMETER
 IDC INSULATED DISPLACEMENT CONNECTOR
 IS ISOLATED GROUND
 IT INPUT/OUTPUT (DEVICE)
 IP INTERNET PROTOCOL
 IS INFORMATION SYSTEMS
 IT INFORMATION TECHNOLOGY
 ITS INFORMATION TECHNOLOGY SYSTEMS
 KVM KEYBOARD / VIDEO / MOUSE
 LAN LOCAL AREA NETWORK
 LCD LIQUID CRYSTAL DISPLAY
 LED LIGHT-EMITTING DIODE
 LE MAIN CROSS-CONNECT
 MD MAIN DISTRIBUTOR
 MDF MAIN DISTRIBUTION FRAME
 MH MAINTENANCE HOLE
 MM MULTIMODE
 MULTITELECOMMUNICATIONS OUTLET ASSEMBLY
 NA NINETEEN MOUNTING HEIGHT (N) TO CENTER OF DEVICE AFF
 N/A NOT APPLICABLE
 NEC NATIONAL ELECTRICAL CODE
 NI NOT IN CONTRACT
 NT NOT TO SCALE
 NVR NETWORK VIDEO RECORDER
 OS OUTSIDE DIAMETER
 OFE OWNER-FURNISHED EQUIPMENT
 OEM ORIGINAL EQUIPMENT MANUFACTURER
 OFP OPTICAL FIBER CONDUCTIVE RISER CABLE
 OFNP OPTICAL FIBER NONCONDUCTIVE PLENUM CABLE
 OFNRP OPTICAL FIBER NONCONDUCTIVE RISER CABLE
 OPT OPTICAL LINE TERMINAL
 OTS OPTICAL NETWORK TERMINAL
 OTSP OUTSIDE PLANT
 OTDR OPTICAL TIME DOMAIN REFLECTOMETER
 PA PUBLIC ADDRESS
 PBX PRIVATE BRANCH EXCHANGE
 POE POWER OVER ETHERNET
 PON PASSIVE OPTICAL NETWORK
 POS POINT OF SALE
 PR PAIR
 PSC PUBLIC SWITCHED TELEPHONE NETWORK
 PTZ PAN, TILT, AND ZOOM
 PV POLYVINYL CHLORIDE
 QOS QUALITY OF SERVICE
 RDC REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
 REQ REQUEST TO EXIT
 RF RADIO FREQUENCY
 RFID RADIO FREQUENCY IDENTIFICATION
 RGB RED, GREEN, BLUE
 RU RACK UNIT
 RX RECEIVER
 RS STRUCTURED CABLING SYSTEM
 S/TP SCREENED TWISTED-PAIR
 SF FILL FORM FACTOR
 SFT SCREENED / FOIL TWISTED-PAIR
 SM SINGLE MODE
 STP SHIELDED TWISTED-PAIR
 TBB TELECOMMUNICATIONS BONDING BACKBONE
 TC TELECOMMUNICATIONS CLOSET
 TDD TELECOMMUNICATIONS DEVICE FOR THE DEAF
 TDDM TELECOMMUNICATIONS DISTRIBUTION METHODS MANUAL
 TE TELECOMMUNICATIONS ENCLOSURE
 TBC TELECOMMUNICATIONS EQUIPMENT BONDING CONDUCTOR
 TBB TELECOMMUNICATIONS GROUNDING BUSBAR
 TMGR TELECOMMUNICATIONS MAIN GROUNDING BUSBAR
 TNC TELECOMMUNICATIONS OUTLET
 TV TELEVISION
 TX TRANSMITTER
 U/FTP UNSHIELDED TWISTED-PAIR WITH FOIL SCREENED TWISTED-PAIR CONDUCTORS
 UL UNDERWRITERS LABORATORIES INC.
 UNO UNLESS NOTED OTHERWISE
 UPS UNINTERRUPTIBLE POWER SUPPLY
 USOC UNIVERSAL SERVICE ORDER CODE
 UTP UNSHIELDED TWISTED-PAIR
 UTP UNSHIELDED TWISTED-PAIR WITH UNSHIELDED TWISTED-PAIR CONDUCTORS
 V/LAN VIRTUAL LAN
 VOIP VOICE OVER INTERNET PROTOCOL
 VPN PRIVATE NETWORK
 WAN WIDE AREA NETWORK
 WAO WORK AREA OUTLET
 WAP WIRELESS ACCESS POINT
 WLAN WIRELESS LOCAL AREA NETWORK

	1. SOME SYMBOLS MAY NOT BE USED.		
	2. MOUNTING HEIGHTS ARE TO CENTER U.N.O.		MOUNTING HEIGHT UNLESS NOTED OTHERWISE
<u>SYMBOL</u>	<u>DESCRIPTION</u>		
	<u>VOICE/DATA SYMBOLS</u>		
▼ 1	(1) CAT6 UTP		18"
	<u>SECURITY SYMBOLS</u>		
	INTERIOR SECURITY SYSTEM CAMERA (1) CAT6 UTP EXTERIOR SECURITY SYSTEM CAMERA (1) CAT6 UTP CEILING MOUNTED; WALL MOUNTED; *PTZ = PAN, TILT, ZOOM,		92" 144"
	SECURITY SYSTEM CARD READER, INCLUDES DOOR POSITION SWITCH(ES)		46"
	INTERCOM: BASE, DOOR STATION		46"

1. DASHED SYMBOLS INDICATE EXISTING DEVICES TO BE REMOVED.
2. SOLID SYMBOLS WITH LIGHT LINEWEIGHT INDICATE EXISTING DEVICES TO REMAIN.
3. DASHED SYMBOLS WITH SUBSCRIPT "RL" INDICATE EXISTING DEVICES TO BE RELOCATED.
4. SOLID SYMBOLS WITH SUBSCRIPT "RD" INDICATE RELOCATED DEVICES

AC	ABOVE COUNTER
C	CEILING MOUNTED OUTLET
F	FLOOR MOUNTED OUTLET
S	SURFACE RACEWAY OUTLET
M	MODULAR FURNITURE OUTLET
W	WALL MOUNTED
WG	WIRE GUARD
WP	WEATHER PROOF

1. ALL CATEGORY CABLEING AS SPECIFIED IN DIVISION 27 AND/OR DIVISION 28, INCLUDING BUT NOT LIMITED TO CABLEING FOR NURSE CALL, CCTV, ACCESS CONTROL, AV-OVER-IP, CONTROL, NETWORK, AND HDBASET, SHALL BE PROVIDED BY DIVISION 27 STRUCTURED CABLEING CONTRACTOR. ALL CATEGORY CABLEING FOR DIVISION 27 AND DIVISION 28 APPLICATIONS SHALL COMPLY WITH INSTALLATION, TESTING, AND CERTIFICATION REQUIREMENTS PER SPECIFICATION SECTION 27 10 00.

1. DO NOT SCALE DRAWINGS. VERIFY DIMENSIONS IN FIELD PRIOR TO COMMENCEMENT OF WORK.

2. WHEREVER THE WORD "REQUIRED" IS USED IT SHALL MEAN TO "FURNISH AND INSTALL".

3. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO ESTABLISH A STANDARD OF QUALITY. THE OWNER RESERVES THE RIGHT TO APPROVE METHOD AND MATERIAL, NOT REFLECTED HEREIN.

4. CONTRACTOR SHALL VISIT SITE PRIOR TO BID AND VERIFY THAT CONDITIONS ARE AS INDICATED. CONTRACTOR SHALL INCLUDE IN HIS BID COSTS REQUIRED TO MAKE HIS WORK MEET EXISTING CONDITIONS.

5. WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER TO THE SATISFACTION OF THE OWNER.

6. WORK, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE AND NATIONAL CODES, ORDINANCES AND STANDARDS.

7. PROVIDE RECORD DRAWINGS, INCLUDE ALL ADDENDUM ITEMS, CHANGE ORDERS, ALTERATIONS, REWORKINGS, ETC.

8. VERIFY EXACT LOCATION OF EQUIPMENT PRIOR TO ROUGH-IN.

9. ALL CABLEING THAT PASSES THROUGH OR ORIGINATES IN EXPOSED CEILING SPACES SHALL BE INSTALLED IN LISTED METALLIC RACEWAYS. REFER TO ELECTRICAL REQUIREMENTS SECTION FOR RACEWAY TYPE. RACEWAYS ON OR BELOW GRADE SHALL BE SCHEDULE 40 PVC. TRANSITIONS FROM ON-TO ABOVE GRADE SHALL BE WITH RIGID STEEL ELBOWS. EMT FITTINGS SHALL BE WITH LEADABLE IRON OR STEEL. CONNECTORS SHALL BE INSULATED THROAT TYPE.

10. THERE SHALL BE NO MORE THAN 20 90 DEGREE BENDS BETWEEN PULL BOXES. PULL BOXES AND CABLE TRAYS SHOWN ON DRAWINGS SHALL BE SUPPORTED BY OR MINIMUM 12" SPACING. CONTRACTOR SHALL INSTALL PULL BOXES ACCORDING TO FIELD CONDITIONS.

11. ALL CABLEING ABOVE ACCESSIBLE CEILING AREAS, WHERE NOT IN CABLE TRAY, SHALL BE SUPPORTED WITH A J-HOOK SUPPORT SYSTEM. J-HOOK SPACING SHALL VARY BETWEEN 4" AND 5" ON CENTER. J-HOOK SHALL NOT BE SUPPORTED BY OR MINIMUM 12" SPACING. CONTRACTOR SHALL PROVIDE CEILING GRID WIRES OR ANY OTHER BUILDING ANCHURY SYSTEM SUCH AS ELECTRICAL OR PLUMBING CONDUIT.

12. REFER TO ARCHITECTURAL PLANS FOR WALL CONSTRUCTION.

13. RACEWAYS SHALL BE RUN AS INCONSPICUOUSLY AS POSSIBLE. VERTICAL RUNS SHALL OCCUR IN CORNERS OF ROOMS. HORIZONTAL RUNS SHALL OCCUR ALONG BASEBOARD OF WALL WITH VERTICAL RUNS UP TO THE DOWN GRESS BRASS PLATE AT CORNER BOXES, TEES OR ELBOWS.

14. ALL CONDUITS IN AREAS WITHOUT SUSPENDED CEILINGS SHALL BE RUN AS INCONSPICUOUSLY AS POSSIBLE, HIDDEN BEHIND BASE, CLOSE TO DECK, ETC. OBTAIN APPROVAL OF CONDUIT RUNS BELOW BEAMS WITH OWNER'S REPRESENTATIVE.

15. ADD STEEL BRIDGING BETWEEN PURLINS/JOISTS/BEAMS AS NECESSARY TO SUPPORT THE WEIGHT OF SUSPENDED DEVICES AND FIXTURES.

16. ALL DEVICES IN CEILINGS IN A ROOM SHALL BE ALIGNED.

17. AT EXISTING LOCATION WHERE WALL FURRING DEPTH IS TOO SHALLOW FOR A STANDARD DEPTH JUNCTION BOX, CONTRACTOR SHALL CHISEL OUT SURROUNDING MATERIAL TO THE BOX IS FLUSH WITH WALL. WHERE CONDUIT IS TOO DEEP, CONTRACTOR SHALL CHANNEL OUT SURROUNDING MATERIAL, EXPOSED SURFACE MOUNTED CONDUIT AND JUNCTION BOXES ARE PROHIBITED.

18. PROVIDE SURFACE RACEWAY SIZE ADEQUATE FOR QUANTITY OF DATA CABLES.

19. COORDINATE WITH OWNER FOR EXACT MOUNTING HEIGHT AND LOCATION OF ALL WALL-MOUNTED SECURITY CAMERAS.

20. FOR ALL EXTERIOR NETWORK DEVICES CONNECTING WITH CATEGORY CABLEING, PROVIDE SURGE PROTECTION DEVICE IN TECHNOLOGY ROOM (OR NEAR TELECOMMUNICATIONS ENCLOSURE SERVING NETWORK DEVICE, IF THERE IS NO TECHNOLOGY ROOM).

21. REFER TO SITE PLANS FOR SITE REQUIREMENTS.

22. PROVIDE ONE 2 INCH SLEEVE INTO EACH ROOM FROM THE CORRIDOR WHERE WALLS GO UP TO THE FLOOR OR ROOF DECK ABOVE, UNLESS OTHERWISE NOTED. PROVIDE ONE 2 INCH SLEEVE ABOVE HEIGHT OF SUSPENDED CEILING, AS CLOSE TO FLOOR OR ROOF DECK AS POSSIBLE.

23. ALL DEVICES SHOWN IN CASEWORK/MILLWORK FOR SLAB-ON-GRADE FLOORS THAT ARE NOT OTHERWISE SHOWN TO BE FED FROM THE WALL OR A SERVICE POLE SHALL PLAN FOR CABLEING TO BE INDOOR/OUTDOOR OR SPATIALIZED.

24. FOR ALL FLOOR BOXES AND "POKE THRU" DEVICES, PROVIDE A PATHWAY FOR FUTURE LOW-VOLTAGE CABLEING, REGARDLESS IF ANY DATA OR AV IS CALLED OUT OR NOT. FOR FLOOR BOXES, THIS SHOULD BE A CONDUIT OVER TO AND UP THE WALL AT A STRUCTURAL COLUMN TO AN ACCESSIBLE CEILING. FOR "POKE THRU'S" WITH OPEN OR HARD ID CEILING BELOW, THIS SHOULD BE A CONDUIT TO AN ACCESSIBLE CEILING. FOR "POKE THRU'S" WITH ID CEILING BELOW, NO ADDITIONAL CONDUIT IS REQUIRED AS THE CURRENT / FUTURE CABLEING CAN USE J-HOOKS.

25. REFER TO T700 SERIES DRAWINGS FOR DETAILS AND DIAGRAMS REGARDING AV CABLEING AND DEVICES THAT MAY NOT BE SHOWN ON THE FLOOR PLAN.

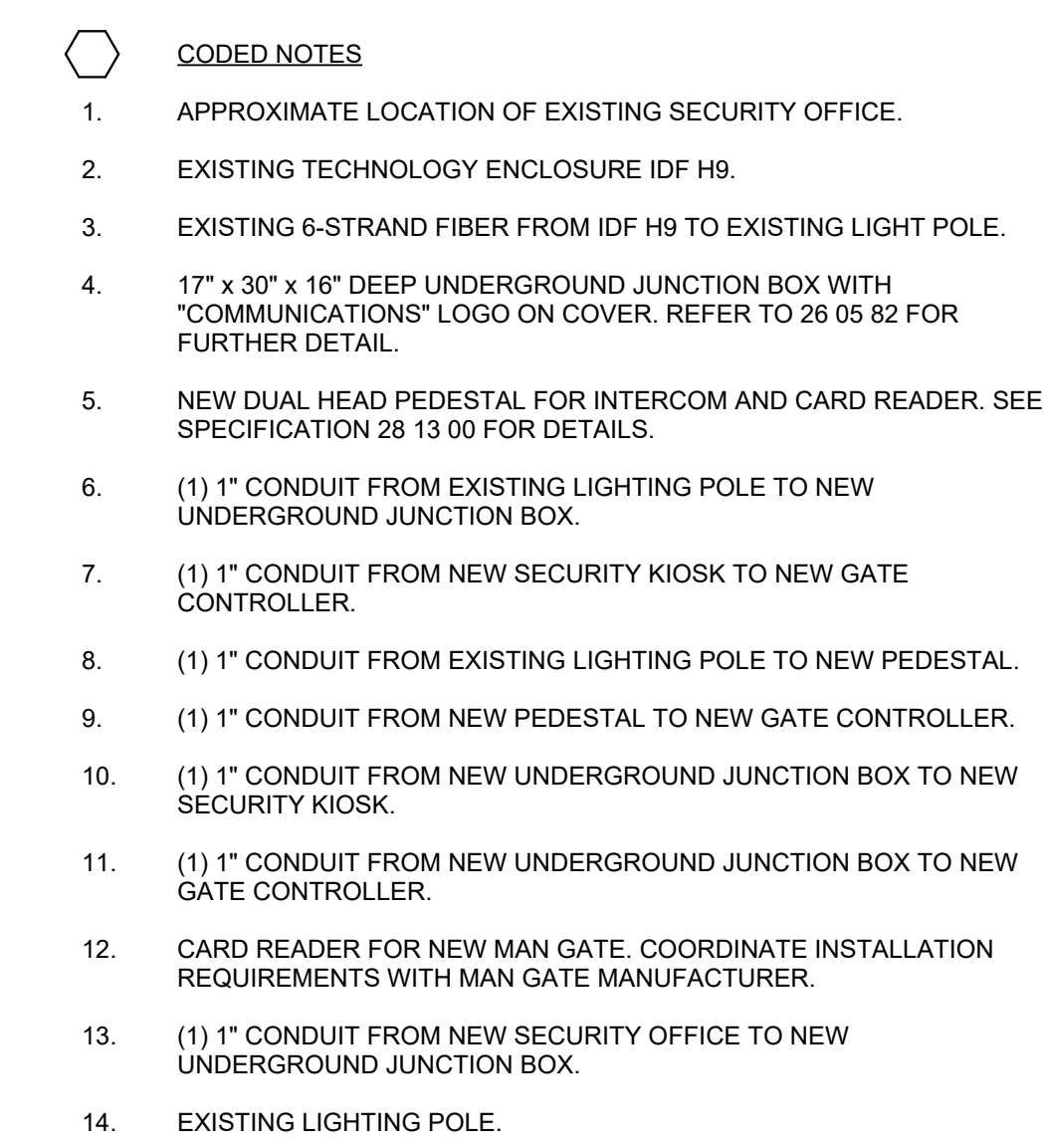
1.	FOR ALL VOICE/DATA APPLICATIONS, EXCEPT FOR INDIVIDUAL SECURITY DEVICES, 1" MINIMUM CONDUIT IS REQUIRED.
2.	CONDUIT FILL CALCULATIONS ARE BASED ON 25% SPARE FUTURE CAPACITY.
3.	FOR MIXED CABLE TYPES IN THE SAME CONDUIT, PERFORM CONDUIT FILL CALCULATIONS FOR MAXIMUM CROSS-SECTIONAL AREA OF 30%.
4.	VERIFY ALL CABLE TYPES ARE OF SIMILAR O.D. AS BASIS OF DESIGN.



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1650 Watermark Drive, Suite 200 - Columbus, Ohio 43215-7010
TEL 614-487-1650 - WEB www.korda.com

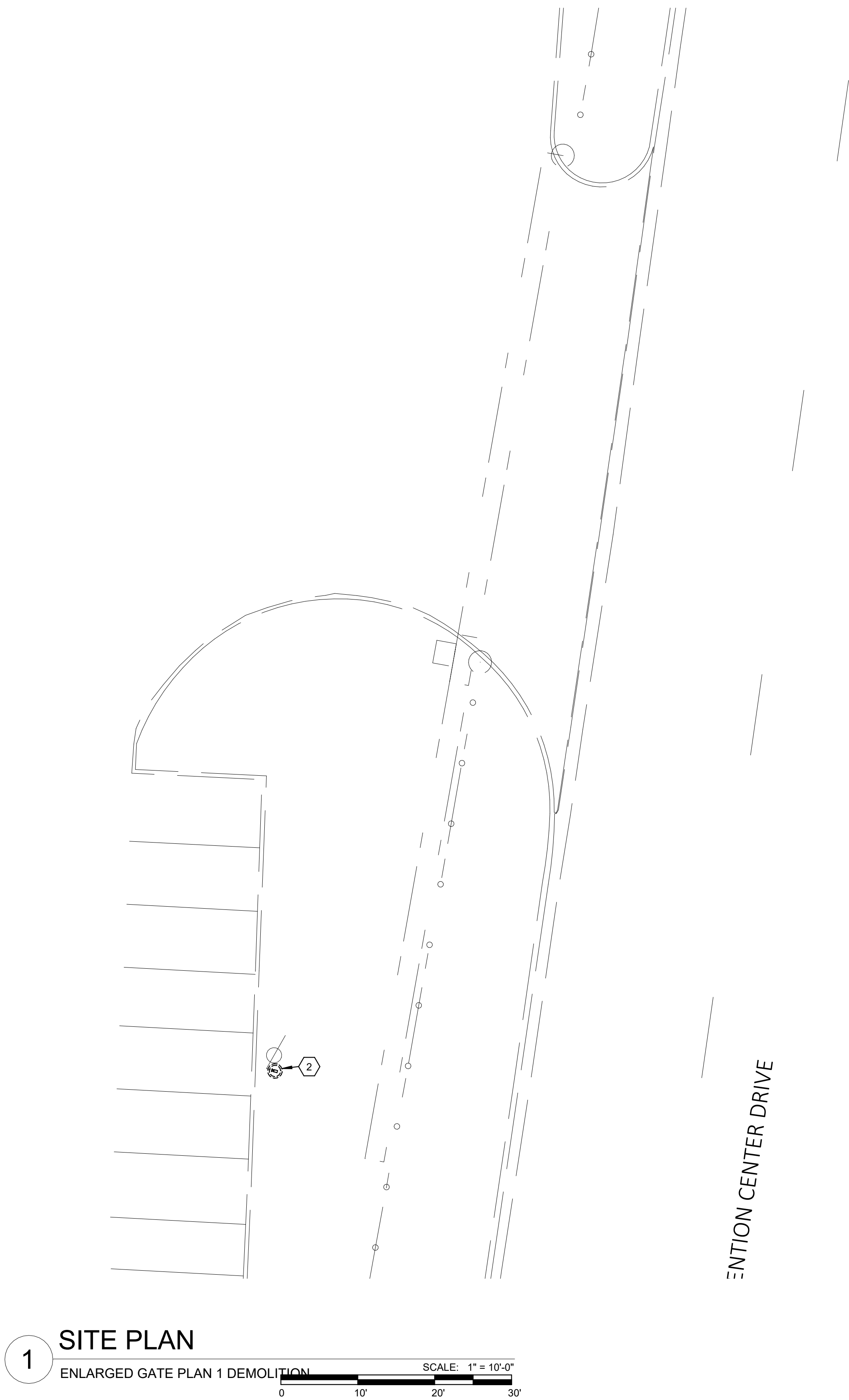
PROJECT STATUS:		Project Status	
PROJECT NUMBER:		2026-0416	
DRAWN BY: Nicolas Elgie	DATE	SHEET NUMBER	
DESIGNED BY: Nicolas Elgie	09/25/2026	T0.0	
CHECKED BY: Justin Schultz			

**NOT FOR
CONSTRUCTION**
WORKING DRAWINGS
FOR REVIEW



No.	Description		Date		
GREATER COLUMBUS CONVENTION CENTER SITE SECURITY IMPROVEMENTS					
BID DOCUMENTS					
					
Korda/Nemeth Engineering, Inc. - Consulting Engineers 1050 Watermark Drive, Suite 200 • Columbus, Ohio 43215-7010 TEL 614-487-1050 • WEB www.korda.com					
TECHNOLOGY SITE PLAN OVERALL					
PROJECT STATUS:			Project Status		
PROJECT NUMBER:			2026-0416		
DRAWN BY:	Nicolas Elgie		DATE	SHEET NUMBER	
DESIGNED BY:	Nicolas Elgie		09/25/2026	T0.1	
CHECKED BY:	Justin Schultz				

**NOT FOR
CONSTRUCTION**



1 SITE PLAN
ENLARGED GATE PLAN 1 DEMOLITION SCALE: 1" = 10'-0"

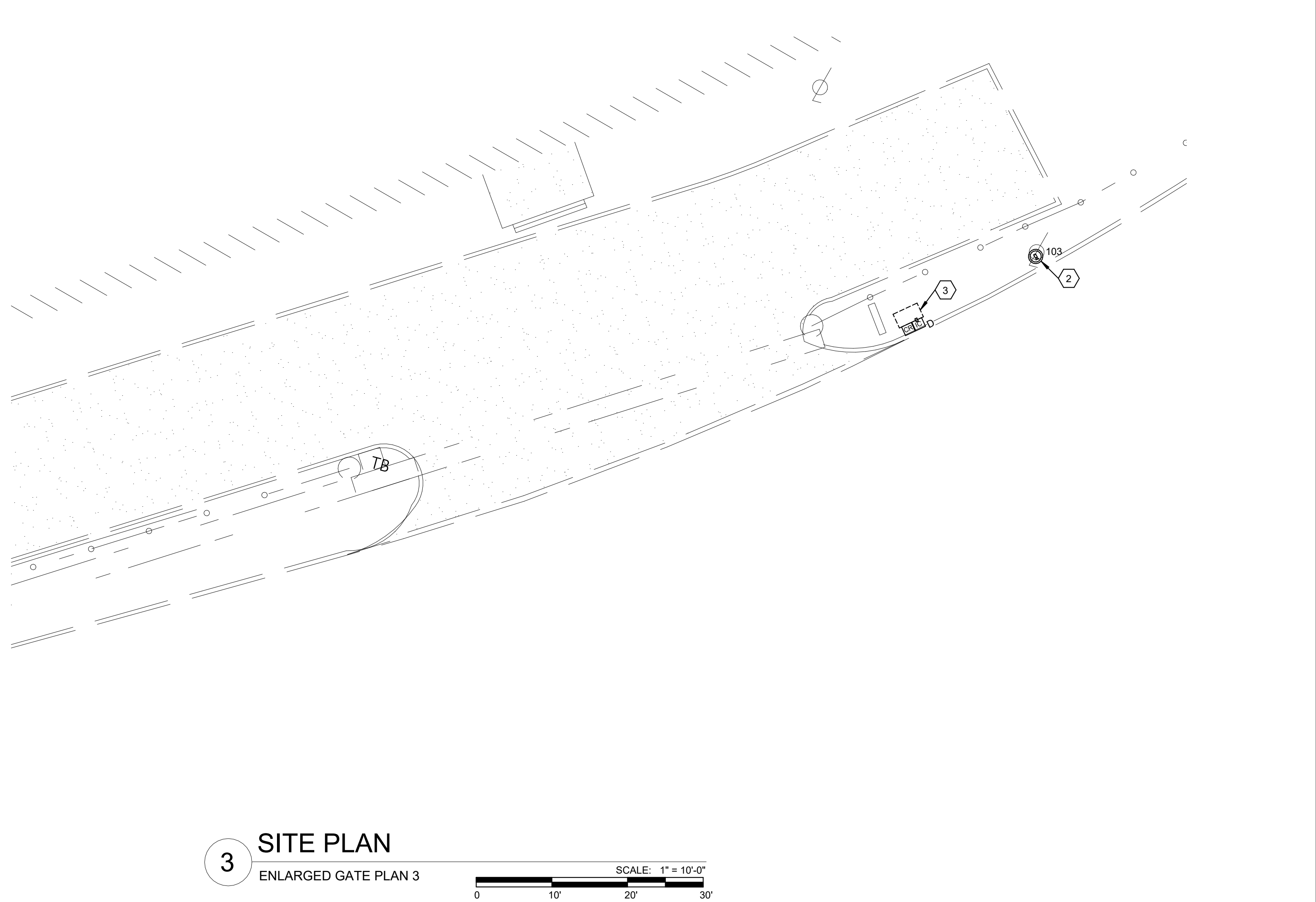
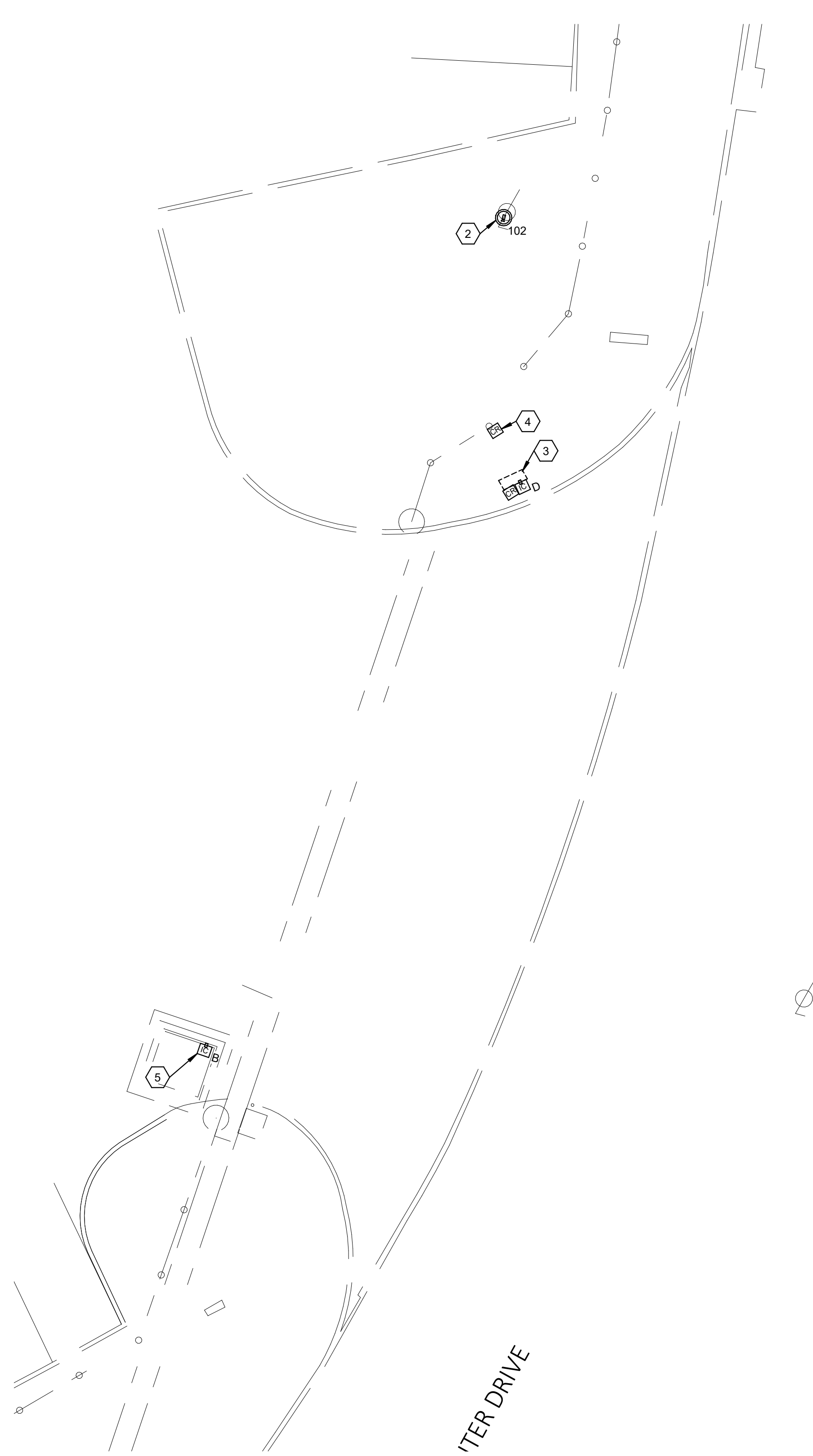
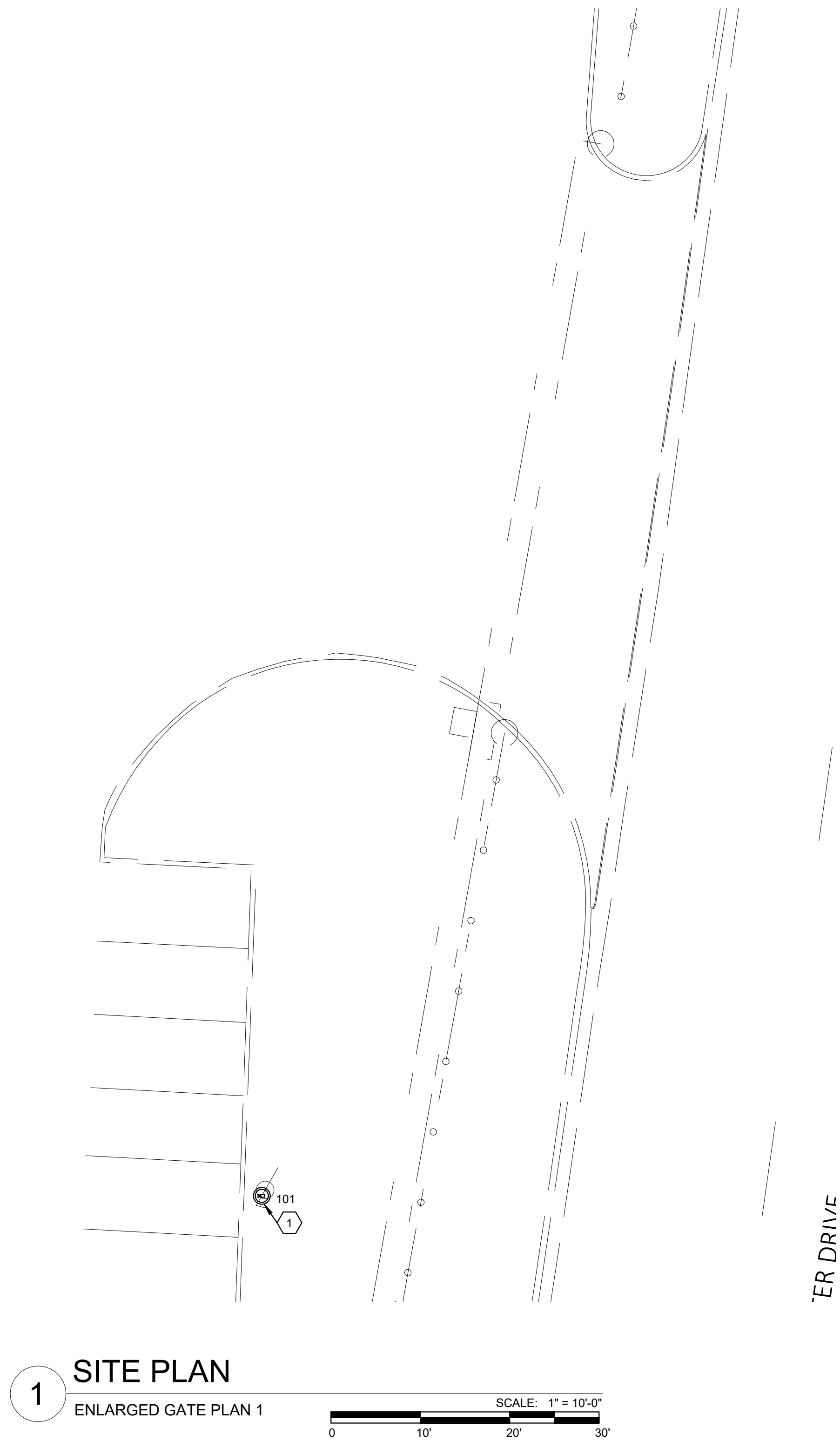


2 SITE PLAN
ENLARGED GATE PLAN 2 DEMOLITION SCALE: 1" = 10'-0"

- CODED NOTES
1. EXISTING ABANDONED FIBER CONNECTION TO BE DEMOLISHED.
 2. ONLY CAMERA TO BE DEMOLISHED. NEMA ENCLOSURE AND ALL COMPONENTS INSIDE TO REMAIN.

No.	Description	Date
GREATER COLUMBUS CONVENTION CENTER SITE SECURITY IMPROVEMENTS BID DOCUMENTS		
KORDA Korda/Nemeth Engineering, Inc. - Consulting Engineers 1650 Watermark Drive, Suite 200 - Columbus, Ohio 43215-7010 TEL 614-487-1650 - WEB www.korda.com		
TECHNOLOGY SITE ENLARGED DEMOLITION PLANS		
PROJECT STATUS:		Project Status
PROJECT NUMBER:		2026-0416
DRAWN BY:	Nicolas Elgie	DATE
DESIGNED BY:	Nicolas Elgie	SHEET NUMBER
CHECKED BY:	Justin Schultz	09/25/2026
T1.1		

NOT FOR
CONSTRUCTION
WORKING DRAWINGS
FOR REVIEW

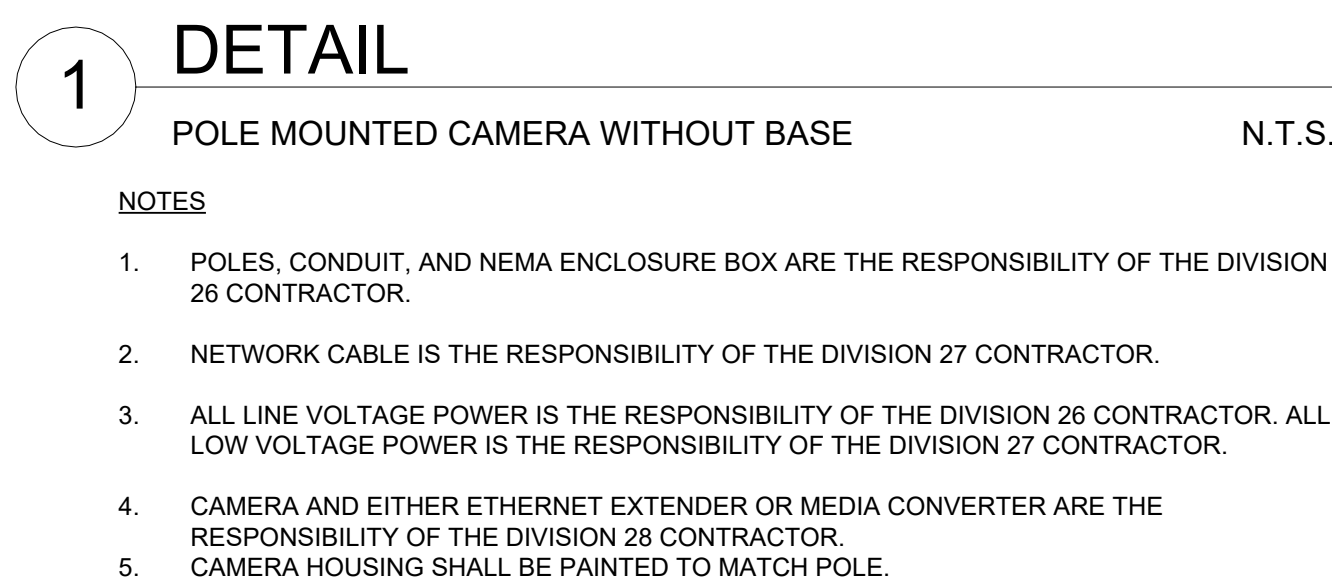


CODED NOTES

1. NEW CAMERA TO BE INSTALLED ON EXISTING SITE LIGHTING POLE. CAMERA BY DIV. 28. DIV. 27 CONTRACTOR TO PROVIDE (2) NEW 2-STRAND OSP MM OM4 FIBER CABLES AND FUSION SPLICE TO EXISTING 6-STRAND MM FIBER CABLE. DIV. 27 CONTRACTOR SHALL PROVIDE A FIBER OPTIC FUSION SPLICE TRAY WITHIN EXISTING ENCLOSURE. SIZED AS REQUIRED TO ACCOMMODATE ALL FUSION SPLICES AND MAINTAIN MINIMUM FIBER BEND RADIUS REQUIREMENTS. BASIS OF DESIGN MANUFACTURERS: CORNING, COMMSCOPE, OR ENGINEER APPROVED EQUIVALENT. NEW 2-STRAND FIBER CABLES SHALL BE RUN TO MEDIA CONVERTERS ON OTHER LIGHTING POLES. SEE SITE PLAN FOR PATHWAYS.
2. NEW CAMERA TO BE INSTALLED ON EXISTING SITE LIGHTING POLE. CAMERA AND MEDIA CONVERTER / ENCLOSURE BY DIV. 28. DIV. 27 CONTRACTOR SHALL PROVIDE SFP MODULES AT BOTH ENDS. SEE SPECIFICATION 28 23 00 FOR MEDIA CONVERTER / ENCLOSURE DETAILS.
3. DUAL HEAD PEDESTAL FOR INTERCOM AND CARD READER. PROVIDE (2) OSP CAT6 CABLES FROM MEDIA CONVERTER AT NEARBY LIGHT POLE.
4. CARD READER TO BE INSTALLED ON MAN GATE. PROVIDE (1) OSP CAT6 CABLE FROM MEDIA CONVERTER AT NEARBY LIGHT POLE.
5. INTERCOM FOR NEW SECURITY KIOSK. PROVIDE (1) OSP CAT6 CABLE FROM MEDIA CONVERTER AT NEARBY LIGHT POLE.

No.	Description	Date
GREATER COLUMBUS CONVENTION CENTER SITE SECURITY IMPROVEMENTS BID DOCUMENTS		
KORDA Korda/Nemeth Engineering, Inc. - Consulting Engineers 1650 Watermark Drive, Suite 200 - Columbus, Ohio 43215-7010 TEL 614-487-1650 - WEB www.korda.com		
TECHNOLOGY SITE ENLARGED NEW WORK PLANS		
PROJECT STATUS:		Project Status
PROJECT NUMBER:		2026-0416
DRAWN BY:	Nicolas Elgie	DATE
DESIGNED BY:	Nicolas Elgie	SHEET NUMBER
CHECKED BY:	Justin Schultz	T2.1

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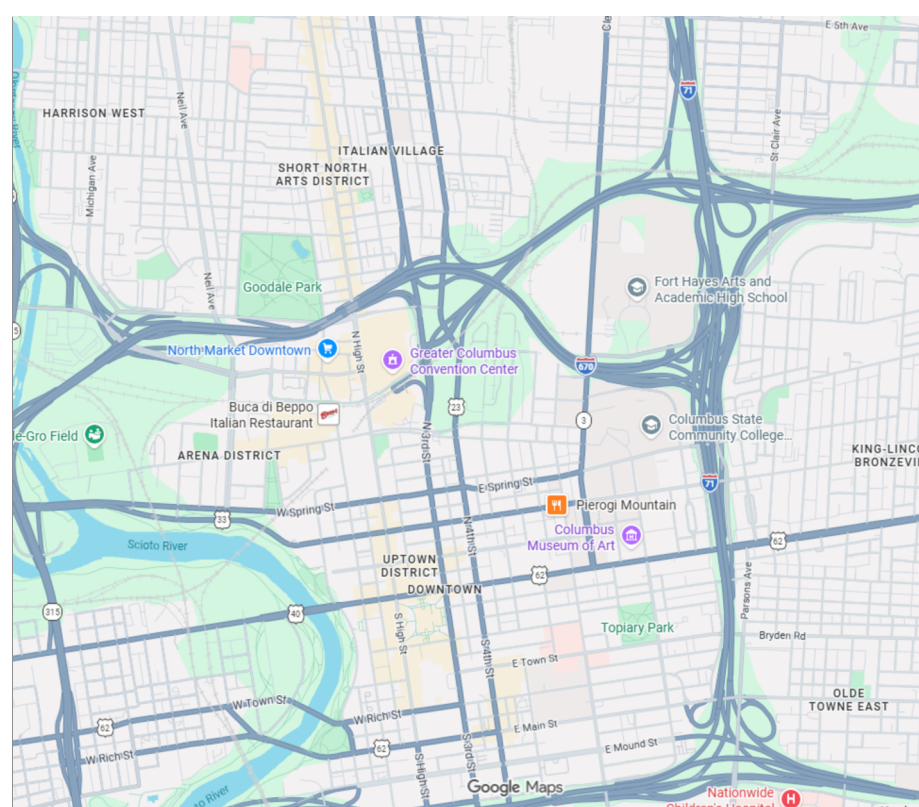


CAMERA SCHEDULE					
NUMBER	TYPE	MOUNTING	ENVIRONMENT	DESCRIPTION	SHEET
101	4-WAY MULTISENSOR	POLE MOUNTED	EXTERIOR	4-WAY MULTISENSOR	T2.1
102	4-WAY MULTISENSOR	POLE MOUNTED	EXTERIOR	4-WAY MULTISENSOR	T2.1
103	4-WAY MULTISENSOR	POLE MOUNTED	EXTERIOR	4-WAY MULTISENSOR	T2.1

No.	Description		Date
GREATHER COLUMBUS CONVENTION CENTER SITE SECURITY IMPROVEMENTS			
BID DOCUMENTS			
 Korda/Nemeth Engineering, Inc. - Consulting Engineers 1050 Watermark Drive, Suite 200 - Columbus, Ohio 43215-7010 TEL 614-467-1950 • WEB www.korda.com			
TECHNOLOGY DETAILS			
PROJECT STATUS:			Project Status
PROJECT NUMBER:			2026-0416
DRAWN BY: Nicolas Elgie	DATE	SHEET NUMBER	
DESIGNED BY: Nicolas Elgie	09/25/2026	T7.1	
CHECKED BY: Justin Schultz			

**NOT FOR
CONSTRUCTION**

WORKING DRAWINGS
FOR REVIEW



(applicable for all survey sheets)

- | | | | |
|--|--|--|---------------------------------------|
| | Building Wall | | Lighting Pull Box |
| | Curb | | Fiber Optic Pull Box |
| | Curb and Gutter | | Air Conditioning Unit |
| | Pavement/Walk | | Electric Pull Box |
| | Index Contour | | Telephone Pull Box/Pedestal |
| | Intermediate Contour | | Traffic Pull Box |
| | Water line | | Unknown Utility Pull Box |
| | Chilled Water line | | Traffic Signal Pedestal |
| | Gas Line | | Area Drain |
| | Combined Sewer | | Clean Out |
| | Sanitary Sewer | | Down Spout |
| | Storm Sewer | | Ground Light |
| | Manhole | | Stamess/Test Header |
| | Open Grate Manhole | | Fire Hydrant |
| | Curb Inlet | | Post Indicator Valve |
| | Valve | | Irrigation Control Valve |
| | Underground Electric line | | Fire Department Connection |
| | Steam and Condensation Return line | | Monitoring Well |
| | Electric Manhole | | Gas Line Marker |
| | Underground Telephone | | Sanitary Sewer Line Marker |
| | Underground Fiber Optic | | Telephone Line Marker |
| | Telephone Pole | | Water Line Marker |
| | Telephone Manhole | | Guypole |
| | Overhead Signal Line | | Guy Wire Anchor |
| | Overhead Signal Line | | Traffic Signal |
| | Underground Traffic Line | | Top of Casting Elevation |
| | Unknown Pole | | Information Obtained From Record Plan |
| | Power Pole | | Abandoned Utility |
| | Power/Light Pole | | Spot Elevation |
| | Light Pole | | Top of Curve Elevation |
| | Fence | | Bottom of Curve Elevation |
| | Right of Way Line | | Control Point |
| | Easement Line | | Aerial Target |
| | Setback Line | | Boring Location |
| | Property Line | | Traffic Bollard |
| | Original Subdivision Lot Lines | | Sign |
| | FEMA Flood Zone Boundaries per FEMA Graphics Plotting Only | | Flag Pole |
| | Further route of utility unknown | | Tower |
| | Hedge Row | | Round Cover |
| | Tree Line/Shrub Line | | Square Cover |
| | Bushes | | Concrete Pavement, Walk, Slab |
| | Trees | | Brick Walk |
| | Picnic Table | | |
| | Trash Can | | |
| | Parking Block | | |
| | Bench | | |
| | Handicap Ramp | | |

Not all symbols necessarily used

CONTROL POINTS				
No.	Northing	Easting	Elevation	Description
1	719272.102	1828514.978	759.47	MAG Nail Set
2	718783.973	1828528.177	752.07	MAG Nail Set
3	718504.247	1828463.511	749.46	MAG Nail Set
4	718267.884	1828120.093	745.74	MAG Nail Set
5	717985.688	1827704.126	766.36	MAG Nail Set
6	718511.583	1827623.617	752.86	MAG Nail Set
7	717617.196	1827753.429	755.40	MAG Nail Set

*All coordinates provided are grid coordinates based on State Plane Coordinates Ohio South Zone NAD 83 with 2011 NSRS adjustment (epoch 2010.00) as established by GPS observations using the Ohio Department of Transportation Real-Time Network (ODOT RTN) with GEOID18. Horizontal and vertical units are in U.S. Survey Feet.

No.	Elevation	Description
-----	-----------	-------------

No.	Elevation	Description
1	759.06	Chiseled "X" on East Flange Bolt of Fire Hydrant
2	752.07	Chiseled Square on Northeast Corner of Concrete Light Pole Base
3	751.32	Chiseled Square on North Side of the Bridge Pier Base
4	759.61	Chiseled Square on Northwest Corner of Concrete Light Pole Base
5	763.81	Chiseled "X" on West Flange Bolt of Fire Hydrant
6	755.49	Chiseled "X" on Northeast Flange Bolt of Fire Hydrant

*Elevations are based on NAVD 88 utilizing The Ohio Department of Transportation Ohio Real Time Network (ODOT RTN) with GEOID18. Source Benchmark is Franklin County Survey Control Designation N308 with an elevation of 752.910 (NAVD 88). Source Benchmark was verified by GPS methods. Horizontal and vertical units are in U.S. Survey Feet.

1. All underground utility locations are shown as accurately as possible based on surface evidence (valves and manholes), markings found in the field, and/or record plans received from the owner or utility companies. Items noted (rec) were obtained from existing plans. Utility locations are not necessarily complete or correct. Any utility in close proximity to proposed work should be "potholed" for exact location prior to construction. OUPS Ticket # 2611903792-000.

2. A title report, containing documentation or easements of record was not provided. Not all easements affecting the property may be shown.

3. The elevations on this survey are based on NAVD 88. Record drawings of buildings and infrastructure may exist having a differing datum. Exercise caution when utilizing this survey by correlating record drawings and proposed work with survey information shown on this drawing.

4. Benchmarks and control points shown on this survey may have been disturbed, since the completion of this survey. Verify that existing monumentation correlates with data shown on this survey prior to use.

5. Utilities noted (Ab) are denoted as such per record plan and may have been abandoned or removed. Their existence and/or status has not been verified.

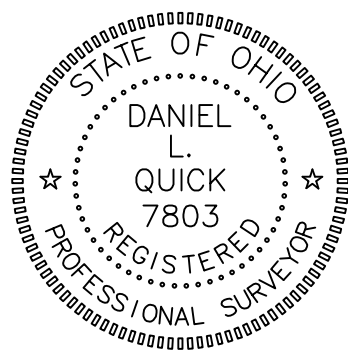
6. Buildings are located from the surveyed at grade edge. Location of the interior and underground structural footprint has not been verified. Due to possible variations in building exterior above the at grade edge, the building location should be used for site plan use only.

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8. The lots delineated on this plat are found on F.E.M.A. community panel No. 39049C0307K dated 06/17/08. The property is located in Zone X and are therefore not in a flood hazard area.

9. Trees shown do not indicate dripline or root area.

10. Building overhangs are in an approximate location.



CERTIFICATION

I hereby certify that this plat is a true and correct representation of a survey performed under my responsible direction and supervision and is correct to the best of my knowledge.

09/25/2026
DATE

09/25/2026



WWW.KORDA.COM

DRAWN BY:

DESIGNED BY: _____

CHECKED BY: _____

PROJECT NUMBER:

DRAWN BY: CAD

35210152.91

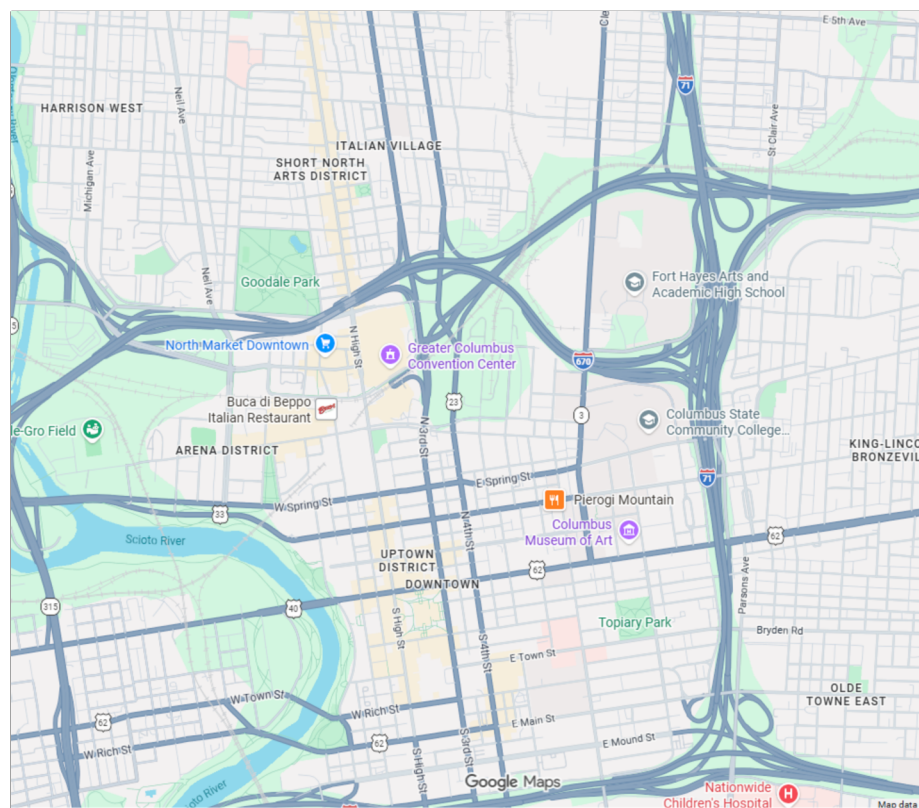
DESIGNED BY: _____

2026-0416

DATE	SHEET NUMBER
------	--------------

DATE	SHEET NUMBER

TS10



LEGEND

(applicable for all survey sheets)

	Building/Wall		Lighting Pull Box
	Curb		Fiber Optic Pull Box
	Curb and Gutter		Air Conditioning Unit
	Pavement/Walk		Electric Pull Box
	Index Contour		Telephone Pull Box/Pedestal
	Water line		Traffic Pull Box
	Chilled Water line		Unknown Utility Pull Box
	Gas Line		Traffic Signal Pedestal
	Combined Sewer		Area Drain
	Sanitary Sewer		Clean Out
	Storm Sewer		Down Spout
	Manhole		Ground Light
	Open Grate Manhole		Siamese/Test Header
	Curb Inlet		Fire Hydrant
	Valve		Post Indicator Valve
	Underground Electric line		Irrigation Control Valve
	Steam and Condensation Return line		Fire Department Connection
	Electric Manhole		Monitoring Well
	Underground Telephone		Gas Line Marker
	Underground Fiber Optic		Sanitary Sewer Line Marker
	Telephone Pole		Telephone Line Marker
	Telephone Manhole		Underground Traffic Line
	Overhead Signal Line		Unknown Pole
	Overhead Signal Line		Power Pole
	Underground Traffic Line		Power/Light Pole
	Unknown Pole		Light Pole
	Power Pole		Fence
	Power/Light Pole		Right of Way Line
	Light Pole		Easement Line
	Fence		Setback Line
	Right of Way Line		Property Line
	Easement Line		Original Subdivision Lot Lines
	Setback Line		FEMA Flood Zone Boundaries
	Property Line		per FEMA Graphics Plotting Only
	Original Subdivision Lot Lines		Further route of utility unknown
	FEMA Flood Zone Boundaries		Hedge Row
	per FEMA Graphics Plotting Only		Tree Line/Shrub Line
	Further route of utility unknown		Bushes
	Hedge Row		Trees
	Tree Line/Shrub Line		Picnic Table
	Bushes		Trash Can
	Trees		Parking Block
	Picnic Table		Bench
	Trash Can		Handicap Ramp
	Parking Block		
	Bench		
	Handicap Ramp		

Not all symbols necessarily used

CONTROL POINTS

No.	Northing	Easting	Elevation	Description
1	719272.102	1828514.978	759.49	MAG Nail Set
2	718783.973	1828528.177	752.07	MAG Nail Set
3	718504.247	1828463.511	749.46	MAG Nail Set
4	718267.884	1828120.093	745.74	MAG Nail Set
5	717985.688	1827704.126	766.36	MAG Nail Set
6	718511.583	1827623.617	752.86	MAG Nail Set
7	717617.196	1827753.429	755.40	MAG Nail Set

*All coordinates provided are grid coordinates based on State Plane Coordinates Ohio South Zone NAD 83 with 2011 NSRS adjustment (epoch 2010.00) as established by GPS observations using the Ohio Department of Transportation Real-Time Network (ODOT RTN) with GEOID18. Horizontal and vertical units are in U.S. Survey Feet.

BENCHMARKS

No.	Elevation	Description
1	759.06	Chiseled "X" on East Flange Bolt of Fire Hydrant
2	752.07	Chiseled Square on Northeast Corner of Concrete Light Pole Base
3	751.32	Chiseled Square on North Side of the Bridge Pier Base
4	759.61	Chiseled Square on Northwest Corner of Concrete Light Pole Base
5	763.81	Chiseled "X" on West Flange Bolt of Fire Hydrant
6	755.49	Chiseled "X" on Northeast Flange Bolt of Fire Hydrant

*Elevations are based on NAVD 88 utilizing The Ohio Department of Transportation Ohio Real Time Network (ODOT RTN) with GEOID18. Source Benchmark is Franklin County Survey Control Designation N308 with an elevation of 752.910 (NAVD 88). Source Benchmark was verified by GPS methods. Horizontal and vertical units are in U.S. Survey Feet.

NOTES:

- All underground utility locations are shown as accurately as possible based on surface evidence (valves and manholes), markings found in the field, and/or record plans received from the owner or utility companies. Items noted (rec) were obtained from existing plans. Utility locations are not necessarily complete or correct. Any utility in close proximity to proposed work should be "potholed" for exact location prior to construction. OUPS Ticket # 2611963792-000.
- A title report, containing documentation or easements of record was not provided. Not all easements affecting the property may be shown.
- The elevations on this survey are based on NAVD 88. Record drawings of buildings and infrastructure may exist having a differing datum. Exercise caution when utilizing this survey by correlating record drawings and proposed work with survey information shown on this drawing.
- Benchmarks and control points shown on this survey may have been disturbed, since the completion of this survey. Verify that existing monumentation correlates with data shown on this survey prior to use.
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KORDA

KORDA NEMETH ENGINEERING
WWW.KORDA.COM

DESIGNED BY: CAQ
CHECKED BY: DLQ
PROJECT NUMBER: 2026-0416

GREATER COLUMBUS CONVENTION CENTER
SITE SECURITY IMPROVEMENTS
BID DOCUMENTS

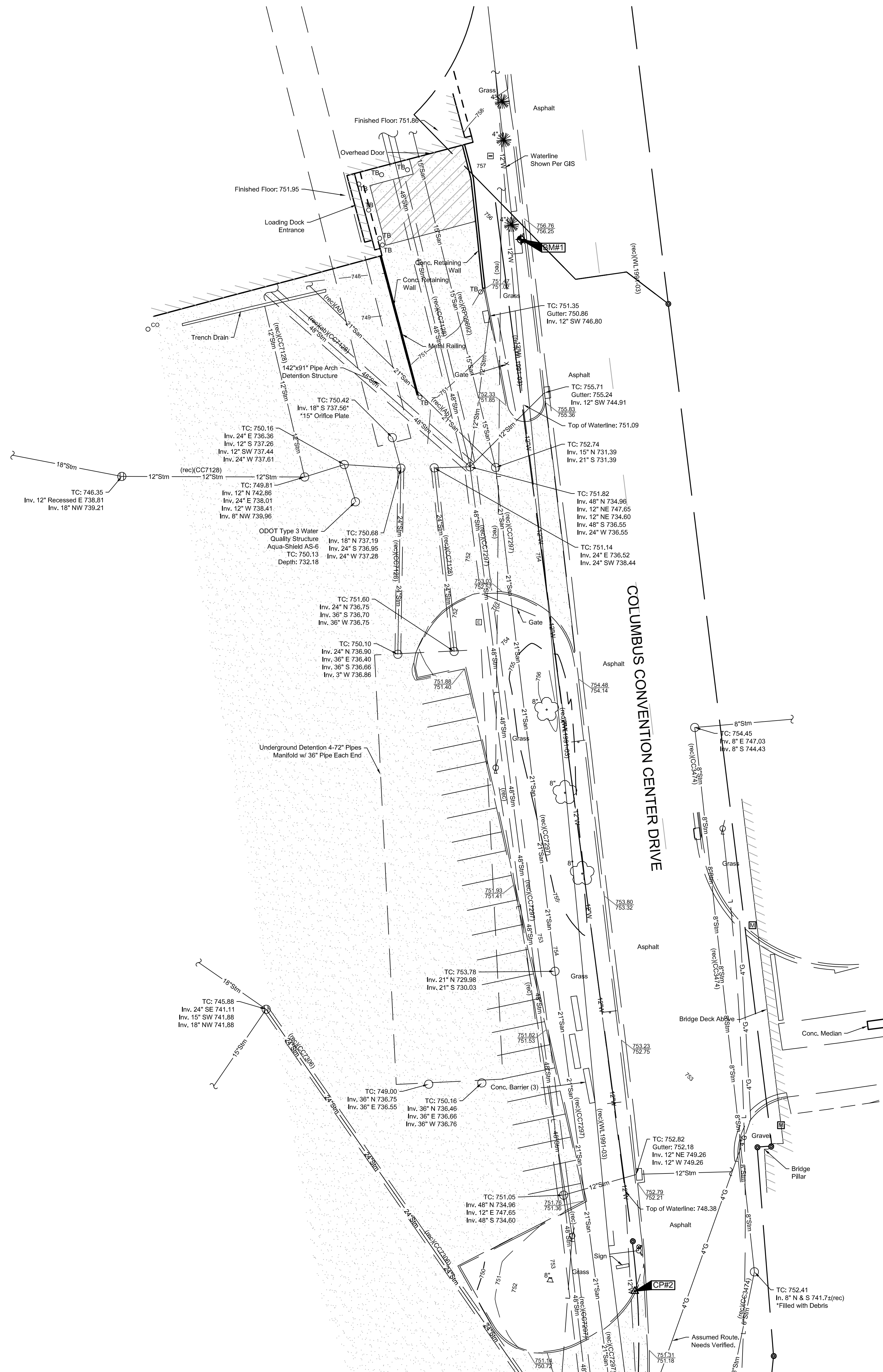
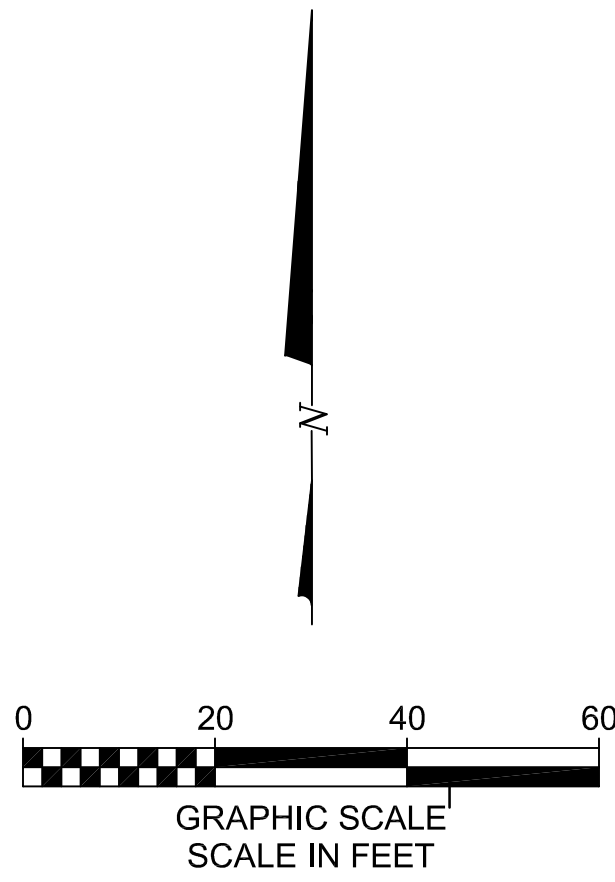
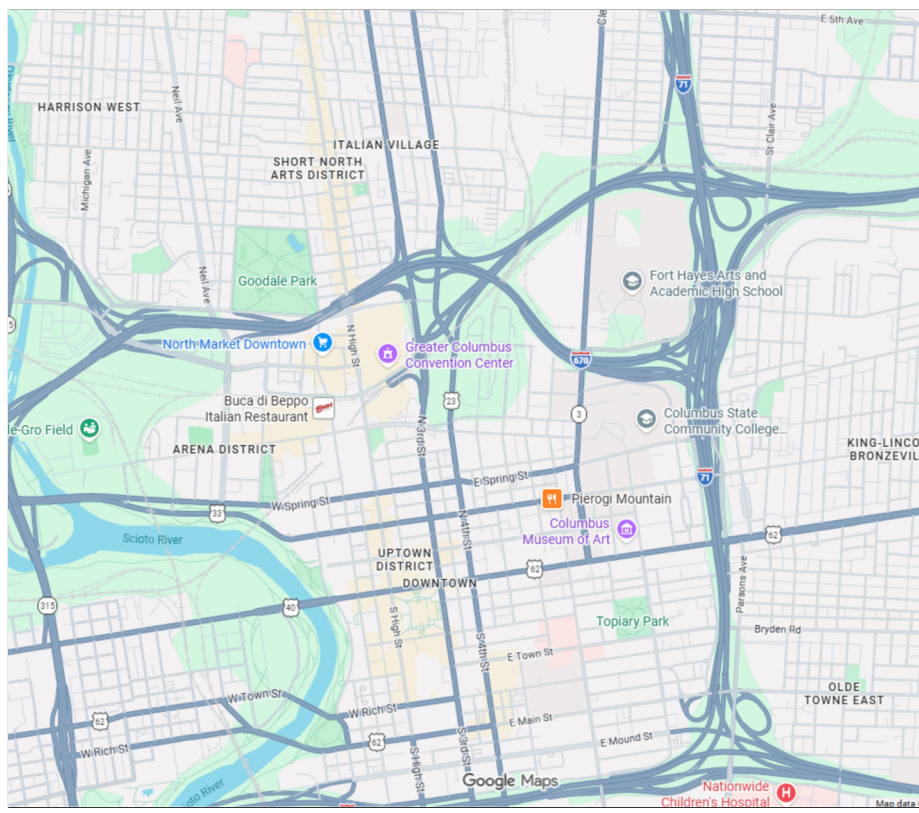
KORDA

Korda/Nemeth Engineering, Inc. Consulting Engineers
1650 Watermark Drive, Suite 200 • Columbus, Ohio 43215-7010
TEL 614-487-1650 • WEB www.korda.com

PROJECT NUMBER: 2026-0416
DRAWN BY: CAQ
DESIGNED BY: DLQ
CHECKED BY: DLQ

DATE: 09/25/2026
SHEET NUMBER: 151.1

NTS



1. All underground utility locations are shown as accurately as possible based on surface evidence (valves and manholes), markings found in the field, and/or record plans received from the owner or utility companies. Items noted (rec) were obtained from existing plans. Utility locations are not necessarily complete or correct. Any utility in close proximity to proposed work should be "polished" for exact location prior to construction. OUPS Ticket # **2611903792-000**.
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	Manhole		Ground Light
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	Curb Inlet		Fire Hydrant
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	Underground Fiber Optic		Sanitary Sewer Line Marker
	Telephone Pole		Telephone Line Marker
	Telephone Manhole		Water Line Marker
	Overhead Signal Line		Guyote
	Overhead Signal Line		Guy Wire Anchor
	Underground Traffic Line		Traffic Signal
	Unknown Pole		TC: 736.50
	Power Pole		(rec)
	Power/Light Pole		(Ab)
	Light Pole		109.50
	Fence		738.23
	Right of Way Line		109.23
	Easement Line		△ or ●
	Setback Line		✱
	Property Line		● B-7
	Original Subdivision Lot Lines		○ TB
	FEMA Flood Zone Boundaries per FEMA Graphics Plotting Only		— —
	Further route of utility unknown		○
	Hedge Row		⌈
	Tree Line/Shrub Line		○
	Bushes		□
	Trees		Concrete Pavement, Walk, Stairs
	Picnic Table		Brick Walk
	Trash Can		
	Parking Block		
	Bench		
	Handicap Ramp		

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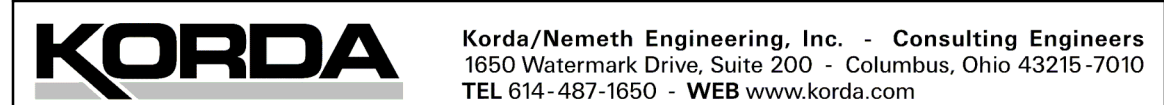
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No.	Description	Date

GREATER COLUMBUS CONVENTION CENTER
SITE SECURITY IMPROVEMENTS
BID DOCUMENTS



KORDA: NEMETH ENGINEERING		PROJECT NUMBER:		2026-0416	
WWW.KORDA.COM		DRAWN BY:		CAQ	DATE
DRAWN BY:		DESIGNED BY:			SHEET NUMBER
DESIGNED BY:		CHECKED BY:			09/26/2026
CHECKED BY:		PROJECT NUMBER:		2026-0416	TS1.2
PROJECT NUMBER:		CHECKED BY:		DLQ	