DATE: October 16, 2024

DEPARTMENT OF GENERAL SERVICES
BUREAU OF CAPITAL PROJECT DESIGN MANAGEMENT
1800 HERR STREET
HARRISBURG, PENNSYLVANIA

ADDENDUM NO. 3

on

PROJECT NO. DGS C-0961-0044 PHASE 001
PROJECT TITLE - DMVA - Biddle AGS - Building 237 Renovations
PROFESSIONAL:
Zimmerman Studio
Zimmerman Studio, South Broad Street, Philadelphia, PA, USA
Philadelphia, PA, 19144

If you submitted a bid prior to this Addendum being issued, your bid has been discarded and you must re-submit your bid(s) prior to the bid opening date and time.

Project No. DGS 0961-0044 Phase 1
Biddle AGS - Building 237 Renovations
Zimmerman Studio LLC
1. Administrative Changes - All Contracts
Item 1 - See attached Addendum 3 PDF
3. Specification Changes - All Contracts
Item 1 - See attached Addendum 3 PDF
3. Drawing Changes - All Contracts
Item 1 - See Addendum 3 PDF

DEPARTMENT OF GENERAL SERVICES
BUREAU PRE-CONSTRUCTION
1800 HERR STREET
HARRISBURG, PENNSYLVANIA

ADDENDUM NO. 3

10.11.2024

PROJECT NO. DGS C-0961-0044 PHASE 1
PROJECT TITLE – Biddle AGS Building 237 Renovations
PROFESSIONAL'S NAME AND ADDRESS-Zimmerman Studio LLC, 1927 South Broad St, First Floor Philadelphia, PA 19148

ADMINISTRATIVE CHANGES – ALL CONTRACTS

Item 01- CLARIFICATION: The project is not Federally-funded and "Buy American" is not a requirement.

CHANGES - .1 CONTRACT

Item 01 – CLARIFICATION: The tile and mastic along with covebase, ceiling panels were tested on December 23, 2016 and ACM were not detected.

Item 02 – CLARIFICATION: Sodding & lawn renovation is for trailer laydown and areas of potential disturbance.

Item 03 - Section 101000 2.2 E:. DELETE portion of paragraph "Apply minimum… rough edges" Add "Print the back side of non-glare 1/8" clear acrylic then print the tactile text and Braille on the front." Section 101000 2.2 F Delete paragraph in its entirety.

Item 04 - Section 31200 1.9: DELETE parapgraphs A., B., C., in its entirety.

Item 05 - Section 31200 3.3: DELETE from 3.4 "The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents."

Item 06 Section 329113 Paragraph 1.4: DELETE subparagraph B.

Item 07: Section 087100: ADD Paragraph 2.7 Accessories for pairs of Doors Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release.

1. Provide filler bar so that combined length of coordinator and filler bar matches door width.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Ingersoll-Rand Company. (IR)
      1) Series: COR Coordinators and filler bar.
   b. Rockwood Manufacturing Company: (RM)
      1) Series: 1600 Coordinators and filler bar.
   c. Trimco.
      1) Product: 3094 and filler bar.

Item 08 - Section 087100: ADD Paragraph 2.15 Auxilary Electrified Door Hardware Section Manufacturers: : Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:

3. DORMA Architectural Hardware; a division of DORMA Group North America.

4. Hager Companies.
5. Horton Automatics.
6. Von Duprin; an Ingersoll-Rand company.

B. Products:
1. Wireless receiver (interior).
2. Electrical Power Transfer EPT-2.
3. Flex loop.
4. Request to Exit Device:
   a. Manufacturer: Honeywell.
5. Power Supply Series PS873.
6. Door Position Sensor (DPS).
7. Security Operator (provided by Owner).
8. Junction Boxes.

Item 09 - Drawing C-04: ADDED 10/C-04 Restoration of Concrete Pavement Detail, 8/C-04 Concrete Joint Detail.

Item 10 - Drawing C-01: – DELETE Contaminated Soils note from drawing.

Item 11 - Drawing EX-01: - DELETE Contaminated Soils note from drawing.

Item 12 - Section 122413: DELETE Paragraph 2.3 and Paragraph 2.5.

Item 13 - Spec 064020 CLARIFICATION: AWI Participation is a DGS Design Requirement.

Item 14 - Drawings A-1.2, A2.2: ADD Note ".1 Contractor is responsible for cutting and patching the roof necessitated by .3 and .2 Work. .1 is responsible for supplying the curb. .1 Contractor is responsible for setting and flashing the curb. .1 Contractor is responsible for installing steel framing support.

Item 15 – C-01: CLARIFICATION: The condition of the 550 ga underground waste oil tank to be removed is unknown. The amount of remaining oil is unknown. Soils were tested in the vicinity and no contamination was found.

CHANGES .2 CONTRACT

Item 01- Drawing H-101: ADD UH-3 tag to unit heater in Vestibule #101.

Item 02- Drawing H-101 ADD note "NG meter is furnished and installed by PECO, contractor shall install all piping and building equipment up to meter and contact PECO to schedule their installation of the meter and their witnessing of the piping pressure testing. Minimum of 5-weeks' notice shall be provided".

Item 03 - Drawing H-601: DELETE "Glycol" from "Glycol Heating Hot Water" title.

Item 04 - H-601 Change Abbreviations HHWS to HWS and HHWR to HWR".

Item 05 – Section 220503: CLARIFICATION-Soldered Joints are acceptable.

Item 06 - Drawing H-601: CLARIFICATION: The project is not Federally-funded and "Buy American" is not a requirement.

Item 07- CLARIFICATION: There's no budget for .3 contract. There is a total budget for all contracts.

Item 08 - CLARIFICATION: No permits are required for the project.

Item 09 - Drawings HD-100, H-100: ADD note “1 Contractor is responsible for cutting and patching the roof necessitated by .2 Work. .1 is responsible for supplying the curb. 1 Contractor is responsible for setting and flashing the curb. .1 Contractor is responsible for installing steel framing support.

Item 10 -HD-100: ADD Note :”.1 Contractor is responsible for removing concrete and patching. .3 Contractor is responsible for excavation, removal of equipment and piping and backfill.

Item 11 - CLARIFICATION: There's no budget for .2 contract. There is a total budget for all contracts.

Item 12 - CLARIFICATION: BAS information is provided in the specification section as well as on H-500.

Item 13 -Section 064020: CLARIFICATION AWI Participation is a DGS Design Requirement.

Item 14 – CLARIFICATION: Water meter is provided by Automatic Logics (Controls Contractor) and installed by the Plumbing Contractor.” Note exists on H502

CHANGES .3 CONTRACT

Item 01- Drawings PD-100, P-100: ADD Note “1 Contractor is responsible for cutting and patching the roof necessitated by .3 Work. .1 is responsible for supplying the curb. 1 Contractor is responsible for setting and flashing the curb. .1 Contractor is responsible for installing steel framing support.

Item 02 – P-100 ADD Note “Water meter is provided by Automatic Logics (Controls Contractor) and installed by the Plumbing Contractor.” Note exists on H502

Item 03 - Section 220503- CLARIFICATION Pro press fittings areacceptable for domestic water above ground only.

Item 04 - Section 220503 CLARIFICATION Mega press fittings are not acceptable for gas piping connections.

Item 05 - Section 220503: CLARIFICATION There is no BAS integration to the mixing valve.

Item 06 - PD-100 : ADD Note “.1 Contractor is responsible for removing concrete and patching. .3 Contractor is responsible for excavation, removal of equipment and piping and backfill.”

Item 07 - P-100: CHANGE Note 4 amended to read: .3 Contractor supplies the drains and .1 Contractor installs them.

Item 08 -P-100: ADD Note to read ”Meter by Controls Contractor and installed by PC. PC to provide PRV”

Item 09: PD-101: ADD Note “.1 Contractor is responsible for removing RWCs, gutters, and concrete around cast iron boots. .3 Contractor is responsible for removing cast iron boot and pipe connections as needed to connect new cast iron boots to stormwater.

SECTION 087100

DOOR HARDWARE

PART 1 - GENERAL

1.1 STIPULATIONS

A. The specifications sections “General Conditions to the Construction Contract”, “Special Conditions”, and “Division 01 – General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 SUMMARY

A. Section includes:

1. Mechanical door hardware for swinging doors and coiling doors.

B. Products furnished, but not installed, under this Section include the products listed below. Coordinating and scheduling the purchase and delivery of these products remain requirements of this Section.

1. Permanent lock cores to be installed by the Client Agency.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
2. Content: Include the following information:
   a. Identification number, location, hand, size, and material of each door and frame.
   b. Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
   c. Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Professional, and Client Agency about door hardware and keying.

B. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

C. Accessibility Requirements: For door hardware on doors in an accessible route, comply with ICC/ANSI A117.1.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. Comply with the following maximum opening-force requirements:
3. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver keys and permanent cores to the Client Agency by registered mail or overnight package service.

1.6 WARRANTY

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

1. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.
   a. Exit Devices: Five years from date of Substantial Completion.
   b. Manual Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:

1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.

C. All locks shall be furnished with removable core cylinders, and shall be a factory recorded continuation or extension of an existing keying system previously furnished for this institution.

1. New building: A new keying schedule shall be started in accordance with Paragraph E. The keying records for both new buildings and existing buildings belong to the

Commonwealth of Pennsylvania and on request, in writing, will be furnished in accordance with Paragraph B.

2. Existing system where small quantities of cores are required: The Institution shall specify the keyway required and uncombinated cores and key blanks needed. The combinating will be done by the Institution.
3. Existing system where large quantities of cores are required: The Institution shall furnish the keying records to the Director of the Key Record Department of the Lock Company, so that cores can be combinated in the factory and in accordance with paragraph B.

D. The Key Coding records shall be sent by Registered Mail to the Institution's Facility Maintenance Manager at the completion of the Project. These records shall go directly from the Manufacturer to the Institution and shall not pass through the hands of the Hardware Distributor.

E. Cylinders shall be furnished complete with collars, construction cores, 7-pin interchangeable cores, and two keys per cylinder. Cylinders shall be of correct type and length, fitted with correct cam or bar for operation of lock, and furnished with back plates and screws where required.

F. Construction cores shall be supplied to the General Contractor during the period of construction. These construction cores shall be returned to the Manufacturer after the permanent master keyed cores are installed.

G. Cores are to be Grand Master Keyed, Master Keyed, Keyed alike in Groups, and/or Keyed individually, as approved by the Institution. A Keying Schedule showing each door location, Manufacturer's lock number, Manufacturer's cylinder type number, finish, length, cam or bar type, and keying detail, shall be prepared by the Cylinder Manufacturer's Representative for the Hardware Supplier, and submitted to the Institution for approval. The Cylinder Manufacturer's Representative shall provide technical assistance and information to the Institution in establishing the keying system. Master keyed cores shall be installed by the General Contractor.

H. Furnish six (6) Master Keys for each group. Furnish six (6) Grand Master Keys and one (1) Control Key, if a new Grand Master Key System is established. The above keys shall be included with the shipment of permanent cores.

2.2 HANGING DEVICES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:
   a. Hager Companies (Basis of Design).
      1) Product: BB1279 Series.
   b. Stanley Commercial Hardware; Div. of The Stanley Works.
      1) Product: FBB179 Series.
   c. Best
   d. Or equal as approved by the Professional
2. Hinge Mounting: Full mortise.
3. Hinge Size: 4-1/2 inches by 4-1/2 inches.
4. Square corners.
5. Provide non-removable pins when hinge barrel is located on non-secure side of door.

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a

minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:
   a. Bommer Industries (BO).(Basis of Design)
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
   c. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
   d. Or equal as approved by the Professional

2.3 MECHANICAL OCKS AND LATCHES

A. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.

B. Manufacturer: Provide products by Best Access Systems, an Assa Abloy Company.

1. Locksets shall be compatible with the Institution’s existing standard Best interchangeable cores.

2. The above item has been approved by the Department as a proprietary item. No other item will be accepted. Section 9.6 and 9.7 of the General Conditions to the Construction Contract does not apply to the above item.

C. Bored Locks: BHMA A156.2; Grade 1. 4000 Series.

1. Product: 9K Series.

D. Lever Handle: Design as selected by the Professional from full range, of available styles.

E. Dummy Trim: Match lever design selected for project.

2.4 EXIT DEVICES AND AUXILIARY ITEMS

A. Exit Devices and Auxiliary Items: BHMA A156.3.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:
   a. Allegion
   b. Corbin Russwin
   c. Von Duprin; an Ingersoll-Rand company.(Basis of Design)
   d. Product: 98 Series.
      1) Rim exit device.
      2) Smooth case.
      3) Cylinder dogging.
      4) Vertical rod where indicated for inactive leaf operation.
      5) Lever trim on secure side of door as selected by the Professional from full range of available styles.

e. Or equal as approved by the Professional

2.5 LOCK CYLINDERS

A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.

1. Manufacturer: Best Access Systems (AGS Standard).

2. Cylinders shall be compatible with the Institution's existing standard Best interchangeable cores.

B. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 5 construction master keys.

C. The above item has been approved by the Department as a proprietary item. No other item will be accepted. Section 9.6 and 9.7 of the General Conditions to the Construction Contract does not apply to the above item.

2.6 OPERATING TRIM

A. Operating Trim: BHMA A156.6; stainless steel, unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. IVES Hardware; an Ingersoll-Rand company. (Basis of Design)
      1) Product: Flush Pull 962.
   b. Rockwood Manufacturing Company.
      1) Product: RM94.
   c. Best
   d. Or equal as approved by the Professional.

2.7 ACCESSORIES FOR PAIRS OF DOORS

A. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release.

1. Provide filler bar so that combined length of coordinator and filler bar matches door width.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Ingersoll-Rand Company. (IR)
      1) Series: COR Coordinators and filler bar.
   b. Rockwood Manufacturing Company: (RM)
      1) Series: 1600 Coordinators and filler bar.
   c. Trimco.
      1) Product: 3094 and filler bar.

2.8 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Manufacturers: Subject to compliance with requirements, provide products by the following, or equal as approved by the Professional:

   a. Von Duprin

   b. TruDoor

   c. LCN Closers; an Ingersoll-Rand company.(Basis of Design)

      Series: 4040XP Heavy-duty Closer (Basis of Design).
      Provide parallel arm when closer is mounted on push side of door.
      Provide plated cover for closer mechanism.

   d. Or equal as approved by the Professional

2.9 MECHANICAL STOPS AND HOLDERS

A. Wall-Mounted Stops: BHMA A156.16; polished wrought stainless steel base metal.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal as approved by the Professional:
   a. IVES Hardware; an Ingersoll-Rand company (Basis of Design).
      1) Product: 407-1/2 Wall Door Stop.
   b. Rockwood Manufacturing Company.
      1) Product: 409/410/411 Series.
   c. McMaster Carr
   d. Or equal as approved by the Professional

2.10 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders: BHMA A156.8.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or equal as approved by the Professional:

   a. Glynn-Johnson; an Ingersoll-Rand company (Basis of Design).
      1) Products:
         a) Concealed: 100 Series.
   b. Rockwood Manufacturing Company.
      1) Products:
         a) Concealed: Series 11000.
   c. Ives
   d. Or as approved by the Professional.

2.11 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following :
    a. National Guard Products.(Basis of Design)
        1) Product: 5050 Silicone bulb.
    b. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
        1) Product: S88 Silicone gasketing.
    c. Reese Enterprises, Inc.
        1) Product: 638 Series.
    d. Or equal as approved by the Professional

C. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

D. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

E. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following :

1. National Guard Products (NG).
2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
3. Reese Enterprises, Inc. (RE).
4. Or equal as approved by the Professional.

2.12 THRESHOLDS

A. Thresholds: Multi-part assembly consisting of threshold rest(s) and grooved plate with thermal break; fabricated as indicated on drawings.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:
    a. National Guard Products.
    b. Pemko Manufacturing Co.; an ASSA ABLOY Group company (Basis of Design).
        1) Type 1:
            a) Floor Plate/Safety Tread 200.
            b) Floor Plate/Safety Tread 19325 (6-1/2 inches wide). Provide thermal break within grooved plate.
    c. Reese Enterprises, Inc.
    d. Zero International.
    e. Or equal as approved by the Professional.

2. Total Assembly Width: Full width of opening indicated.
3. Depth: Match wall depth.
4. Cope around frame jamb.

2.13 METAL PROTECTIVE TRIM UNITS

A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch-thick stainless steel; with manufacturer's standard machine or self-tapping screw fasteners.

1. Height: 6 inches, unless otherwise noted.
2. Width:
   a. Two inches less than door width on stop side of door.
   b. One inch less than door width on non-stop side of door.
3. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following: :
   a. IVES Hardware; an Ingersoll-Rand company.
   b. Rockwood Manufacturing Company.
   c. Trimco Architectural Hardware.
   d. Or equal as approved by the Professional

2.14 AUXILIARY DOOR HARDWARE

A. Hat and Coat Hook Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:

1. Manufacturer: Hafele America Co.
   Product: 842.02.906 (Basis of Design).
2. McMaster-Carr
3. Gamco
4. Or equal as approved by the Professional.

2.15 AUXILIARY ELECTRIFIED DOOR HARDWARE

A. Manufacturers: : Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:

1. DORMA Architectural Hardware; a division of DORMA Group North America.
2. Hager Companies.
3. Horton Automatics.
4. Von Duprin; an Ingersoll-Rand company.

B. Products:
1. Wireless receiver (interior).
2. Electrical Power Transfer EPT-2.
3. Flex loop.
4. Request to Exit Device:
   a. Manufacturer: Honeywell.
5. Power Supply Series PS873.
6. Door Position Sensor (DPS).
7. Security Operator (provided by Owner).
8. Junction Boxes.

2.16 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

2.17 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

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

PART 3 - EXECUTION

3.1 INSTALLATION

A. Steel Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

B. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.

C. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

D. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent.

E. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Furnish permanent cores to the Client Agency for keying and installation.

F. Perimeter Gasketing: Apply to head and jambs, forming seal between door and frame.
1. At double doors, apply to astragal.

G. Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

DOOR HARDWARE SCHEDULE

Door Hardware Set No. 1

Location: Single Exterior Exit Door (Doors 102-2, 103-2, 121-1, 122-1)

Qty.	Description	Item	Finish
1	Hanging Devices	Geared Continuous Hinge	626
1	Exit Device	Rim Exit Device with Lever	630
2	Securing Device	Key Cylinder	626
1	Protective Trim Units	Kickplate	630
1	Closer	Surface Closer with Stop and Hold Open	626
1 set	Miscellaneous	Weatherstripping	
1	Miscellaneous	Door Sweep	
1	Miscellaneous	Threshold	Aluminum

Door Hardware Set No. 2

Location: Single Interior Door Office Function (Doors 104-1, 112-1, 113-1, 114-1, 115-1)

Qty.	Description	Item	Finish
3	Hanging Devices	Hinges	626
1	Securing Device	Cylindrical Lockset Office Function	626
1	Securing Device	Key Cylinder	
2	Protective Trim Units	Kick plate	630
1	Miscellaneous	Wall Stop	
2	Accessories	Hat and Coat Hook	
	Miscellaneous	Silencers	

Door Hardware Set No. 3

Location: Single Interior Door -Privacy Function (Door 116-1)

Qty.	Description	Item	Finish
3	Hanging Devices	Hinges	626
1	Securing Device	Cylindrical Lockset Privacy Function	626
1	Securing Device	Key Cylinder	
2	Protective Trim Units	Kick plate	630
1	Closer	Surface Closer with Hold open	626
1	Miscellaneous	Wall Stop	
2	Accessories	Hat and Coat Hook	
	Miscellaneous	Silencers	

Door Hardware Set No. 4

Location: Single Interior Door in Restroom (Doors 106-1, 117A-1, 117-1, 118A-1, 118-1)

Qty.	Description	Item	Finish
3	Hanging Devices	Hinges	626
1	Securing Device	Cylindrical Lockset Passage Function	626
1	Securing Device	Key Cylinder	
2	Protective Trim Units	Kick plate	630
1	Closer	Surface Closer with Hold open	626
1	Miscellaneous	Wall Stop	
2	Accessories	Hat and Coat Hook	
	Miscellaneous	Silencers	

Door Hardware Set No. 5

Location: Single Interior Door - Storeroom Function (Doors 107-1,109-1, 110-1, 120-1)

Qty.	Description	Item	Finish
3	Hanging Devices	Hinges	626
1	Securing Device	Cylindrical Lockset Storeroom Function	626
1	Securing Device	Key Cylinder	
2	Protective Trim Units	Kick plate	630
1	Miscellaneous	Wall Stop	
1	Miscellaneous	Silencers	

Door Hardware Set No. 6

Location: Building Entrance (Door 101-3)

Qty.	Description	Item	
2	Hanging Devices	Continuous Geared Hinge	
1	Exit Device (active leaf)	Rim Exit Device	630
1	Exit Device (inactive leaf)	Rim Exit Device (exposed vertical rod), blank exterior.	630
1	Securing Device	Key Cylinder	630
2	Operating Trim	Vertical Rod Pull	
1	Closer (inactive leaf)	Surface-mounted closer with Stop.	630
4	Protective Trim Units	Metal Kickplate	630
1	Accessories	Coordinator and Filler Bar	
1	Miscellaneous	Automatic Door Operator	
1	Miscellaneous	Door Switch (Exterior)	630
1	Miscellaneous	Door Switch (Interior)	630
1	Miscellaneous	Wall Actuator (Secure)	630
1	Miscellaneous	Wall Actuator (Non-secure)	630
1	Miscellaneous	Wireless Receiver	
1	Miscellaneous	Threshold - Type 1	Mill
1	Miscellaneous	Bollard Post	630
1	Miscellaneous	Electric Strike	
1	Miscellaneous	Flex Loop	
1	Miscellaneous	Card Reader (by Owner)	Black
1	Miscellaneous	Request to Exit Device	
1	Miscellaneous	Door Position Sensor	
2	Miscellaneous	Door Sweep	630
	Miscellaneous	Weatherstripping	

Door Hardware Set No. 7

Double Doors From Entry (Doors 101-1, 101-2)

Qty.	Description	Item

8	Hanging Devices	Hinge	626
1	Securing Device (active leaf)	Key Cylinder	626
1	Securing Device (active leaf)	Bored Lockset, Entrance function	626
1	Securing Device (inactive leaf - bottom)	Manual Flush Bolt with dust-proof strike	626
1	Securing Device (inactive leaf - top)	Automatic Flush Bolt	626
1	Closer (active leaf)	Surface closer with stop function.	626
2	Operating Trim (inactive leaf)	Flush Pulls	626
4	Protective Trim Units	Metal Kickplate	630
1	Holder or Stop	Wall Bumper	626
1	Accessories for Pairs of Doors	Astragal	630

Door Hardware Set No. 8

Double Doors into Storage (Doors 103-1)

8	Hanging Devices	Hinge
1	Securing Device (active leaf)	Key Cylinder
1	Securing Device (active leaf)	Bored Lockset, Storeroom function
1	Securing Device (inactive leaf - bottom)	Manual Flush Bolt with dust-proof strike
1	Securing Device (inactive leaf - top)	Constant-Latching Flush Bolt
1	Closer	Surface closer with stop function
2	Operating Trim (inactive leaf)	Flush Pulls
2	Protective Trim Units	Metal Kickplate
2	Miscellaneous	Hat and Coat Hook

Door Hardware Set No. 9
Single Door into Weapons Vault, with Card Reader Access (Wall Bumper), *Fail-Secure Operation* (Door 105-1)

Qty.	Description	Item	
4	Hanging Devices	Hinge	626
1	Securing Device	Bored lockset, Storeroom function.	626
1	Securing Device	Key Cylinder	626
1	Closer	Surface closer with stop function	626
2	Protective Trim Units	Metal Kickplate	630
1	Holder or Stop	Wall Bumper	626
1	Miscellaneous	Electric Strike	
1	Miscellaneous	Card Reader (by Owner)	
2	Miscellaneous	Hat and Coat Hooks	
1 set	Miscellaneous	Perimeter Gasketing	

Door Hardware Set No. 10
Location: Overhead Coiling Door (Door 102-1, 103-3)

Qty.	Description	Item	Finish
1	Securing Device	Key Cylinder	

Door Hardware Set No. 11
Single Door to Exterior (Door 111-1, 120-2)

Qty.	Description	Item

4	Hanging Devices	Hinge
1	Securing Device	Bored Lockset with Entrance function
1	Securing Device	Key Cylinder
1	Closer	Surface Closer with Stop
2	Protective Trim Units	Metal Kickplate
1	Miscellaneous	Threshold - Type 2
1	Miscellaneous	Door Position Sensor
1	Miscellaneous	Door Sweep
1 set	Miscellaneous	Weatherstripping

END OF SECTION 087100

SECTION 101400

SIGNAGE

PART 1 - GENERAL

1.1 STIPULATIONS

A. The specifications sections “General Conditions to the Construction Contract”, “Special Conditions”, and “Division 01 – General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 RELATED DOCUMENTS

A. The specifications sections “General Conditions to the Construction Contract”, “Special Conditions”, and “Division 01 – General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.3 SUMMARY

A. This Section includes the following:

1. Room panel signs.

1.4 DEFINITIONS

A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication and installation details for signs.

1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
2. Provide message list, typestyles, graphic elements, including tactile characters and Braille, and layout for each sign.

C. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:

1. Aluminum.
2. Acrylic sheet.

D. Sign Schedule: Use same designations indicated on Drawings.

E. Qualification Data: For Installer and fabricator.

F. Maintenance Data: For signs to include in maintenance manuals.

G. Warranty: Special warranty specified in this Section.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

C. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.

D. Regulatory Requirements: Comply with applicable provisions in ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements: Verify recess openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 COORDINATION

A. Coordinate placement of anchorage devices with templates for installing signs.

1.9 WARRANTY

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

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

a. Deterioration of metal and polymer finishes beyond normal weathering.
b. Deterioration of embedded graphic image colors and sign lamination.

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum Castings: ASTM B 26/B 26M, of alloy and temper recommended by sign manufacturer for casting process used and for use and finish indicated.

B. Aluminum Sheet and Plate: ASTM B 209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 5005-H32.

C. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 6063-T5.

D. Steel:
1. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, stretcher-leveled standard of flatness.
2. Steel Members Fabricated from Plate or Bar Stock: ASTM A 529/A 529M or ASTM A 572/A 572M, 42,000-psi (290-MPa) minimum yield strength.
3. For steel exposed to view on completion, provide materials having flat, smooth surfaces without blemishes. Do not use materials whose surfaces exhibit pitting, seam marks, roller marks, rolled trade names, or roughness.

E. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).

2.2 ROOM PANEL SIGNS

A. Available Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:

1. Mohawk Sign Systems. (Basis of Design).
2. Best Sign Systems, Inc.
3. ASI-Modulex, Inc.
4. Or equal as approved by the Professional.

B. Interior Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally from corner to corner, complying with the following requirements:
1. Acrylic Sheet: 0.125 inch thick.
2. Edge Condition: Square cut.
3. Corner Condition: Square.
4. Mounting: Aluminum Framed trim.

a. Wall mounted with concealed anchors.
b. Manufacturer's standard anchors for substrates encountered.

5. Color: As selected by the Professional from manufacturer's full range.
6. Tactile Characters: Characters and Grade 2 Braille raised 1/32 inch (0.8 mm) above surface with contrasting colors.

C. Panel Sign Frames:

1. Extruded-Aluminum Frames: Mitered and welded.

a. Color: As selected by the Professional from manufacturer's full range.
b. Profile: Square.
c. Corner Condition: Rounded to radius indicated.
d. Mounting: As indicated.

1) Wall mounted with concealed anchors.
2) Manufacturer's standard noncorroding anchors for substrates encountered.

D. Tactile and Braille Sign: Manufacturer's standard process for producing text and symbols complying with ADA-ABA Accessibility Guidelines and with ICC/ANSI A117.1. Text shall be accompanied by Grade 2 Braille. Produce precisely formed characters with square-cut edges free from burrs and cut marks; Braille dots with domed or rounded shape.

1. Panel Material: Opaque acrylic sheet.
2. Raised-Copy Thickness: Not less than 1/32 inch.

E. Subsurface Copy: ~~Apply minimum 4-mil-thick vinyl copy to back face of clear acrylic sheet forming panel face to produce precisely formed opaque image. Image shall be free of rough edges~~**. Print the back side of non-glare 1/8" clear acrylic then print the tactile text and Braille on the front**

~~F. Subsurface Engraved Acrylic Sheet: Reverse-engrave back face of clear acrylic sheet. Fill resulting copy with enamel. Apply opaque background color coating over enamel-filled copy.~~

G. Colored Coatings for Acrylic Sheet: For copy and background colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and are UV and water resistant for five years for application intended.

1. Color: As selected by the Professional from manufacturer's full range.

H. Panel Sign Schedule:

1. Provided by sign manufacturer based on room and door identifications found on the Drawings.

2.3 ACCESSORIES

A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.4 FABRICATION

A. General: Provide manufacturer's standard signs of configurations indicated.

1. Welded Connections: Comply with AWS standards for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded surfaces of welding flux and dress exposed and contact surfaces.
2. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.

3. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
4. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.5 FINISHES, GENERAL

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

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

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 ALUMINUM FINISHES

A. Clear and Color Anodic Finish: Manufacturer's standard Class 1 clear anodic coating, 0.018 mm or thicker, over a satin (directionally textured) mechanical finish, complying with AAMA 611.

2.7 ACRYLIC SHEET FINISHES

A. Colored Coatings for Acrylic Sheet: For copy and background and frame colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and that are UV and water resistant for five years for application intended.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. Verify that items, including anchor inserts, and electrical power are sized and located to accommodate signs.

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

3.2 INSTALLATION

A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.

1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches of sign without encountering protruding objects or standing within swing of door.

B. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.Select appropriate mounting methods from subparagraphs below.

1. Silicone-Adhesive Mounting: Attach signs to irregular, porous, or vinyl-covered surfaces.
2. Shim Plate Mounting: Provide 1/8-inch-thick, concealed aluminum shim plates with predrilled and countersunk holes, at locations indicated, and where other mounting methods are not practicable. Attach plate with fasteners and anchors suitable for secure attachment to substrate. Attach panel signs to plate using method specified above.
3. Mechanical Fasteners: Use nonremovable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

3.3 CLEANING AND PROTECTION

A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by the Client Agency.

END OF SECTION 101400

SECTION 122413

ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 STIPULATIONS

A. The specifications sections “General Conditions to the Construction Contract”, “Special Conditions”, and “Division 01 – General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

A. Section Includes:

1. Motor operated roller shades @ Multipurpose
2. Manual operated roller shades, except at Multipurpose.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

B. Shop Drawings: Show fabrication and project specific installation details for roller shades, including shadeband materials, their orientation to rollers, their seam and batten locations and relationship to adjacent construction.

1. Indicate locations of joints in exposed closure panels.

C. Samples for Initial Selection: For each type and color of shadeband material.

1. Include Samples of accessories involving color selection.
2. Shadeband Material: Not less than 12 inches square. Mark inside face of material if applicable.
3. Installation Accessories: Finishes applied to metal substrate, 6 inches long, minimum.

D. Roller-Shade Schedule: Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of shadeband material, signed by product manufacturer.

C. Product Test Reports: For each type of shadeband material, for tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roller shades to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:
   1. MechoSystems. (Basis of Design)
   2. Hunter Douglas
   3. Legrand
   4. Or equal as approved by the Professional

B. Source Limitations: Obtain roller shades from single source from single manufacturer.

2.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

A. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.

   1. Bead Chains: Manufacturer's Standard.

a. Loop Length: Full length of roller shade.
b. Limit Stops: Provide upper and lower ball stops.

2. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller-shade weight and lifting heavy roller shades.

a. Provide for shadebands that weigh more than 10 lb or for shades as recommended by manufacturer, whichever criteria are more stringent.

2.3 TOP DOWN ROLLER SHADES

A. Motorized Operating Mechanisms: Provide factory-assembled shade-operator systems of size and capacity and with features, characteristics, and accessories suitable for conditions indicated and recommended by manufacturer for use with shades indicated.

1. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. IQ2+ Encoded Electric Motors for operating roller shades.

a. Electrical Characteristics: Single phase, 24 Hz.

3. Remote Controls Individual wall-switch control stations.

B. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.

1. Roller Mounting Configuration: Single roller
2. Roller Drive-End Location: Right side of inside face of shade
3. Direction of Shadeband Roll: Regular, from back of roller
4. Shadeband-to-Roller Attachment: Manufacturer's standard method Removable spline fitting integral channel in tube

C. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

~~2.3 BOTTOM UP MOTOR CONTROL SYSTEMS~~

~~A. FTS Control System: Specifications and design of shade motors and motor control system are based on the Fabric Tension System by MechoShade Systems, Inc.~~
~~Motor Control System:~~
~~a. FTS Control Module: synchronizing relays in 10" X 8" X 6" electrical control enclosure. FTS module must be accessible and mounted below plane of shade in closed position. One FTS module required per shade.~~
~~b. Control system components shall provide appropriate (spike and brown out) over-current protection (+/- 10 percent of line voltage) for each of the four individual motor circuits and shall be rated by UL or ETL as a recognized component of this system and tested as an integrated system.~~

~~Wall Switches:~~
~~c. Three-button architectural flush mounted switches with metal cover plate and no exposed fasteners.~~

d. Connect local wall switches to control system components via low voltage (12V DC) 4-conductor modular cable equipped with RJ-11 type connectors supplied, installed and certified under Division 16 - Electrical.

Mecho Network Control (Mecho Net Interface)

e. The system shall have the capability of two-way digital communication with the EDU's over a common backbone.

f. Each EDU shall possess 8 addresses capable of being employed for various levels of group control. These addresses shall be configurable via a handheld configurator and/or a PC controller. A 9th unique address shall enable the EDU(s) to be independently controlled and configured over the network via a handheld configurator and/or a PC controller.

g. Low Voltage Communication Network Implementation.

h. The low voltage network shall employ a bus topology with daisy chained network connections between nodes over a CAT5 cable (4 UTP) or over a 2 UTP cable employing at least 1 pair at 16 AWG for power and 1 pair at 22 AWG for data.

i. The low voltage network (+/- 13VDC) shall be powered by the nodes attached to it. These nodes could be line voltage powered EDU's attached to 120 VAC or 230 VAC. Alternatively, low voltage nodes shall be powered typically by a centralized low voltage power supply. If a CAT5 network cable is employed and the node draws less than 1W then the node may be powered supplied by an associated line voltage EDU.Network Capacity: 4000 ft max, 250 nodes max. The number and size of a centralized DC supply shall vary depending upon the network requirements.

2.4 SHADEBAND MATERIALS

A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

B. Light-Blocking Fabric: Opaque fabric, stain and fade resistant.

1. Source: Roller-shade manufacturer.
   a. Basis of Design: Classic Blackout, 700 Series.
2. Type: Fiberglass textile with PVC film bonded to both sides.
3. Orientation on Shadeband: Up the bolt.
4. Features: Washable.
5. Colors:
   a. Interior (room side): Black.
   b. Exterior: White.
6. Seams: As indicated on drawings

C. Shade Fabrication

B. Fabricate shade cloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 1/8 inch (3.18 mm) in either direction per 8 feet (2438 mm) of shade height due to warp distortion or weave design.

C. Provide battens in standard shades as required to assure proper tracking and uniform rolling of the shade bands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer's standards or, in absence of such standards, shall be

responsible for establishing appropriate standards to assure proper tracking and rolling of the shadecloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.

D. For railroaded shade bands, provide seams in railroaded multi-width shade bands as required to meet size requirements and in accordance with seam alignment as acceptable to Architect. Seams shall be properly located. Furnish battens in place of plain seams when the width, height, or weight of the shade exceeds manufacturer's standards. In absence of such standards, assure proper use of seams or battens as required to, and assure the proper tracking of the railroaded multi-width shade bands

E. Provide battens for railroaded shades when width-to-height (W:H) ratios meet or exceed manufacturer's standards. In absence of manufacturer's standards, be responsible for proper use and placement of battens to assure proper tracking and roll of shade bands.

~~2.5 SHADEBAND MATERIALS~~

~~A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701 Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.~~

~~B. Light-Blocking Fabric: Opaque fabric, stain and fade resistant.~~

~~1. Source: Roller-shade manufacturer.~~
~~a. Basis of Design: Classic Blackout, 700 Series.~~
~~2. Type: Fiberglass textile with PVC film bonded to both sides.~~
~~3. Orientation on Shadeband: Up the bolt.~~
~~4. Features: Washable.~~
~~5. Colors:~~
~~a. Interior (room side): Black.~~
~~b. Exterior: White.~~
~~6. Seams: As indicated on drawings~~

2.6 INSTALLATION ACCESSORIES

A. Catch pin.

2.7 ROLLER-SHADE FABRICATION

A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:

1. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible.

1. Railroaded Materials: Railroad material where material roll width is less than the required width of shadeband. Provide battens and seams as required by railroaded material to produce shadebands with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of shadeband.

2. Hem bar for light-filtering shades: Steel or extruded aluminum bar, enclosed in sealed pocket of shadeband material.

2.8 ROLLER SHADE SCHEDULE

A. Shade Assembly RS-1:

1. Fabric: Light-blocking.
2. Accessories:

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance of the Work.

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

3.2 ROLLER-SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.

1. Opaque Shadebands: Located so shadeband is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.

3.3 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

A. Clean roller-shade surfaces after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.

C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

D. END OF SECTION 122413

SECTION 312000

EARTH MOVING

1.1 STIPULATIONS

A. The specifications sections “General Conditions to the Construction Contract”, “Special Conditions” and “Division 01 - General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for walks, pavements and plants.
3. Excavating and backfilling for buildings and structures.
4. Drainage course for concrete slabs-on-grade.
5. Subbase course for concrete walks and pavements.
6. Subsurface drainage backfill for walls and trenches.
7. Excavating and backfilling trenches for utilities and pits for buried utility structures.

B. Related Requirements:

1. Section 013200 "Construction Progress Documentation", Section 013233 "Photographic Documentation" for recording pre-excavation and earth-moving progress.
2. Section 311000 "Site Clearing" for site stripping, grubbing, stripping topsoil, and removal of above- and below-grade improvements and utilities.
3. Section 315000 "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.
4. Section 329200 "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.

1.4 BASIS OF DESIGN

A. Excavation for this Project shall be considered unclassified and shall include all types of earth and soil, any pebbles, boulders, and bedrock, municipal trash, rubbish and garbage and all types of debris of the construction industry such as wood, stone, concrete, plaster, brick, mortar, steel and iron shapes, pipe, wire, asphaltic materials, paper and glass. Unclassified excavation does not include unforeseen concrete foundations, walls, or slabs. All such materials encountered which are identified by this paragraph as unclassified shall be removed to the required widths and depths to create a finished product as shown and/or noted on the drawings and as written in the specifications. No additional compensation shall be made to the contractor for this unclassified excavation. The materials defined by this paragraph as unclassified will not be considered to be concealed conditions or unknown physical conditions below the surface of the ground for purposes of interpreting the language in the General Conditions to the Construction Contract.

1.5 SUBSURFACE INFORMATION

A. Any available data concerning subsurface materials or conditions based on soundings, test pits or test borings, has been obtained by the Department for its own use in designing this Project. The Test Boring location drawings and the Test Boring Logs, as well as the Laboratory Test Results, contained within the Geotechnical Report are incorporated into the construction contract as a Contract Document. The remainder of the Geotechnical Report, with all other exhibits, is available for informational/guidance purposes only; it is not to be relied on by prospective Bidders. The Report is available to Bidders but the Bidders must agree and acknowledge that the information and recommendations in the Report are not warranted for accuracy, correctness or completeness, and is not incorporated into the construction contract as a Contract Document.

B. Test Boring logs reflect the conditions at the specific locations of each Test Boring only. The Contractor accepts full responsibility for any conclusions drawn with respect to conditions between Test Borings. Bidders may perform their own investigation of existing subsurface conditions, with the Department's approval. Excavation for the Project is "Unclassified", as fully described in the Earthwork Section.

1.6 APPROVAL OF BEARING STRATA

A. The Contractor shall furnish adequate advance notification to the Department and the Professional of times when footing excavations or paving subgrades are to be completed, so that the Construction Stage Geotech Quality Assurance Agent can verify that the bearing quality of the soil has been properly inspected and/or tested by the Contractor. Formwork and concreting shall follow only after approval by the Construction Stage Geotech Quality Assurance Agent.

B. Should the bearing at the levels indicated be found by the Professional and the Department to be inadequate, they may order the excavation carried down to sound bearing. Such excavation shall be classed as additional work and payment be made on the basis of an agreed price according to the General Conditions. Should suitable bearing be found at a lesser depth than indicated, the Professional and the Department may order the reduction of excavation specified or shown on the drawings, and the Contractor shall allow a credit for excavation thus omitted on the same basis.

1.7 QUALITY CONTROL TESTING

A. The Contractor shall perform all necessary Quality Control tests and procedures for the performance of the work, in accordance with Section 014000 and this section, to produce the end results specified. The Contractor's Quality Control Agent shall maintain clear and orderly records of such tests and procedures and make them available for field review and approval of the Professional and the Department. The Contractor's bid shall include the cost of all Quality Control tests and inspections.

B. The Contractor shall submit its plan for Quality Control testing to the Professional and the Department for review and comments. The Professional shall consult with its Quality Assurance Agent in arriving at its opinion.

C. Quality Control tests shall include tests on fill material, optimum moisture content and maximum density and field density tests of fill layers. The Quality Control Agent shall comment on the suitability of all subgrades, and the subgrades shall be acceptable to the Consulting Geotechnical Engineer.

D. Handwritten copies of field test reports shall be provided to the Contractor. They shall be given to the Contractor and inspector within two (2) hours of completion, but in no event shall the technician leave the site without providing the Contractor and inspector with a copy of the test results. This shall include density, % moisture, plan location, elevation, comments and any other relevant data. Comments shall include any condition that might have an adverse effect on the operations, including weather, drainage, etc.

E. The Contractor shall request consultation with the Consulting Geotechnical Engineer on any problems that arise during construction. Copies of the daily in-place soil density tests shall be faxed to the consultant by the Contractor through the testing agency within twenty-four (24) hours of the time the tests are made.

F. The Contractor shall approve each subgrade and each fill layer before proceeding to the next layer. Any area which does not meet density, % moisture or other requirements at any time, shall be suitably reworked and retested by the Contractor at his own expense.

G. The Professional and/or the Department will perform all Quality Assurance Testing and Inspection Services deemed necessary for the assurance of the Professional and/or the Department. This does not relieve the Contractor of his responsibilities. The Department will bear the cost of Quality Assurance tests and inspections.

H. The Geotechnical Consultant should provide recommendations on the compaction standards to be used on the project and for which applications. Compaction standards are to be based on Modified Proctor standards, as defined by ASTM D1557 or Standard Proctor standards as defined by ASTM D698.

I. Earthwork specifications shall stipulate that surface water and ground water should be prevented from entering excavations, from ponding on prepared subgrades and from flooding Project site and surrounding area. Earthwork specifications shall also stipulate that subgrades shall be protected from softening, undermining, washout and damage by rain or water accumulation and in no case shall the site be left open and unsealed at the end of the day.

1.8 COORDINATION

A. Each Prime Contractor shall be responsible for providing all trenching, excavation, filling, backfilling, and concrete work required by their respective contract work, and shall comply with the requirements of the applicable specification sections of Division 3 and Division 31 for same.

~~1.9 UNIT PRICES~~

~~A. Work of this Section is affected by unit prices for earth moving specified in Section 012200 "Unit Prices."~~

~~B. Quantity allowances for earth moving are included in Section 012100 "Allowances."~~

~~C. Rock Measurement: Volume of rock actually removed, measured in original position, but not to exceed the following. Unit prices for rock excavation include replacement with approved materials.~~

~~1. 24 inches outside of concrete forms other than at footings.~~
~~2. 12 inches outside of concrete forms at footings.~~
~~3. 6 inches outside of minimum required dimensions of concrete cast against grade.~~

4. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
5. 6 inches beneath bottom of concrete slabs-on-grade.
6. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.

1.10 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by a geotechnical testing agency, according to ASTM D1586.

I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

J. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

K. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

L. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.11 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct pre-excavation conference at Building 237.

1. Review methods and procedures related to earthmoving, including, but not limited to, the following:

a. Personnel and equipment needed to make progress and avoid delays.
b. Coordination of Work with utility locator service.
c. Coordination of Work and equipment movement with the locations of tree- and plant-protection zones.
d. Extent of trenching by hand or with air spade.
e. Field quality control.

1.12 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D2487.
2. Laboratory compaction curve according to ASTM D698

C. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

1.13 QUALITY ASSURANCE

1.14 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Utility Locator Service: Notify Pennsylvania One Call for area where Project is located before beginning earth-moving operations.

D. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified Section 311000 "Site Clearing" are in place.

E. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D2487 or a combination of these groups; free of rock or gravel larger than [3 inches] in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487 or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Sub-base Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.

I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and zero to 5 percent passing a No. 4 sieve.

J. Sand: ASTM C33/C33M; fine aggregate.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 GEOTEXTILES

A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.

2. Apparent Opening Size: No. 40 sieve, maximum; ASTM D4751.
3. Permittivity: 0.2 per second, minimum; ASTM D4491.
4. UV Stability: 50 percent after 500 hours' exposure; ASTM D4355.

2.3 CONTROLLED LOW-STRENGTH MATERIAL

A. Controlled Low-Strength Material: Self-compacting, low-density, flowable concrete material produced from the following:

1. Portland Cement: ASTM C150/C150M, Type I.
2. Fly Ash: ASTM C618, Class C or F.
3. Normal-Weight Aggregate: ASTM C33/C33M, 3/4-inch nominal maximum aggregate size.
4. Water: ASTM C94/C94M.

B. Produce conventional-weight, controlled low-strength material with 80-psi compressive strength when tested according to ASTM C495/C495M.

PART 3 - EXECUTION

3.1 PREPARATION

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

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

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

3.2 DEWATERING

A. Provide dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

D. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. ~~The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents.~~ Changes in the Contract Time may be authorized for rock excavation.

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

a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

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

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

3.5 EXCAVATION FOR STRUCTURES

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

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

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

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: As indicated.

C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.8 EXCAVATION FOR ELEVATOR CYLINDER – N/A

3.9 SUBGRADE INSPECTION

A. Notify Architect when excavations have reached required subgrade.

B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

~~C. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices~~

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.10 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.11 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

B. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.12 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, damp proofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.13 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 "Cast-in-Place Concrete."

D. Trenches under Roadways: Provide 6-inch thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches Concrete is specified in Section 033000 "Cast-in-Place Concrete."

E. Backfill voids with satisfactory soil while removing shoring and bracing.

F. Initial Backfill:

1. Soil Backfill: Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

    a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

2. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches over the pipe or conduit. Coordinate backfilling with utilities testing.

G. Final Backfill:

1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.

H. Warning Tape: Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.14 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill..
5. Under footings and foundations, use engineered fill.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.15 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.16 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D698

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at [95] percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at [92] percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at [85] percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at [85] percent.

3.17 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch
2. Walks: Plus or minus 1 inch
3. Pavements: Plus or minus 1/2 inch

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.18 SUBSURFACE DRAINAGE

A. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted

layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches .

1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D698 with a minimum of two passes of a plate-type vibratory compactor.
2. Place and compact impervious fill over drainage backfill in 6-inch- thick compacted layers to final subgrade.

3.19 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

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

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
1. Shape subbase course[and base course] to required crown elevations and cross-slope grades.
2. Place subbase course[and base course] 6 inches or less in compacted thickness in a single layer.
3. Place subbase course[and base course] that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
4. Compact subbase course[and base course] at optimum moisture content to required grades, lines, cross sections, and thickness to not less than [95] percent of maximum dry unit weight according to[ASTM D698

3.20 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
1. Place drainage course 6 inches or less in compacted thickness in a single layer.
2. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D698.

3.21 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

C. Testing agency will test compaction of soils in place according to ASTM D1556, ASTM D2167, ASTM D2937, and ASTM D6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab but in no case fewer than three tests.

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

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

3.22 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

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

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

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

3.23 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

Section 321723

Pavement Markings

PART 1 GENERAL

1.1 STIPULATIONS

The specifications sections “General Conditions to the Construction Contract”, “Special Conditions” and “Division 01 - General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full

1.2 SUMMARY

A. SECTION INCLUDES

1. Painted pavement markings.

1.3 RELATED REQUIREMENTS

A. Section 321216 - Asphalt Paving.

B. Section 321313 - Concrete Paving.

1.4 PRICE AND PAYMENT PROCEDURES

A. Allowances:

1. See Section 012100 - Allowances for allowances affecting this section.
2. Include cash allowance for pavement markings.

~~B. Prices:~~

~~1. See Section 012200 - Unit Prices for additional requirements.~~
~~2. Basis of Measurement for Linear Painted or Plastic Pavement Markings: By linear foot (linear meter).~~
~~3. Basis of Measurement for Painted or Plastic Pavement Markings Symbols or Text: Per unit.~~
~~4. Basis of Measurement for Raised Pavement Markings: Per unit.~~

C. Alternates:

1. See Section 012300 - Alternates for product alternates affecting this section.
2. This section includes base bid item(s).

1.5 REFERENCE STANDARDS

A. AASHTO M 237 - Standard Specification for Epoxy Resin Adhesives for Bonding Traffic Markers to Hardened Portland Cement and Asphalt Concrete; 2005 (Reapproved 2019).

B. AASHTO M 247 - Standard Specification for Glass Beads Used in Pavement Markings; 2013 (Reapproved 2018).

C. AASHTO M 249 - Standard Specification for White and Yellow Reflective Thermoplastic Striping Material (Solid Form); 2012 (Reapproved 2020).

D. AASHTO MP 24 - Standard Specification for Waterborne White and Yellow Traffic Paints; 2015 (Reapproved 2020).

E. ASTM D4505 - Standard Specification for Preformed Retroreflective Pavement Marking Tape for Extended Service Life; 2012 (Reapproved 2017).

F. ASTM E303 - Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester; 1993 (Reapproved 2018).

G. FHWA MUTCD - Manual on Uniform Traffic Control Devices; 2023.

1.6 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work of this section with adjoining work.
B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by affected installers.

1.7 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Shop Drawings: Indicate survey control points and pavement markings.
C. Shop Drawings: Indicate traffic management plan with barricades, cones, and temporary markings.
D. Product Data: Manufacturer's data sheets on each product to be used.
E. Certificates: Submit for each batch stating compliance with specified requirements.

1. Painted pavement markings.

1.8 Manufacturer's Instructions:

A. Preparation instructions and recommendations.
B. Storage and handling requirements and recommendations.
C. Installation methods.

1.9 Manufacturer's qualification statement.

A. Installer's qualification statement.

1.10 Maintenance Materials: Furnish the following for Owner's use in maintenance of project

A. See Section 016000 - Product Requirements for additional provisions.
B. Extra Paint: 2 containers, 1 gallon (4 liter) size, of each type and color.
C. Extra Markers: 5 percent, of each type and color.

1.11 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience and approved by manufacturer.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Deliver paint in containers of at least 5 gallons (18 L) accompanied by batch certificate.
B. Deliver glass beads in containers suitable for handling and strong enough to prevent loss during shipment, accompanied by batch certificate.
C. Store products in manufacturer's unopened packaging until ready for installation.
D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.13 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.
B. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F (10 degrees C) or more than 95 degrees F (35 degrees C).

1.14 SEQUENCING

A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of markings.

PART 2 PRODUCTS

1.15 MANUFACTURERS

A. Painted Pavement Markings:

1. Dunn-Edwards Corporation; Vin-L-Stripe Specialty Interior/Exterior Flat Zone Marking Paint.
2. Dunn-Edwards Corporation; Vin-L-Stripe Specialty Interior/Exterior Velvet Zone Marking Paint.
3. PPG Traffic Solutions; Ennis Flint Fast Dry Waterborne Traffic Paint, 9852x Series.
4. Substitutions: See Section 016000 - Product Requirements.

1.16 Painted Pavement Markings

A. Comply with Pennsylvania Department of Transportation standards.
B. Comply with FHWA MUTCD.
C. Painted Pavement Markings: As indicated on drawings.

1. Marking Paint: In accordance with AASHTO MP 24.

a. Parking Lots: Yellow.
b. Symbols and Text: White.
c. Wheelchair Symbols: Provide blue and white.

2. Reflective Glass Beads: Type 1, in accordance with AASHTO M 247.
3. Obliterating Paint: Type I, in accordance with AASHTO MP 24.

a. Bituminous Pavement: Black.
b. Concrete Pavement: Gray.

PART 3 EXECUTION

1.17 EXAMINATION

A. Identify existing markings for removal.
B. Verification of Conditions: Verify that pavement is dry and ready for installation.
C. Notify Architect of unsatisfactory conditions before proceeding.

1.18 PREPARATION

A. Establish survey control points for locating and dimensioning of markings.
B. Place barricades, warning signs, and flags as necessary to alert approaching traffic.
C. Clean surfaces prior to installation.

1. Remove dust, dirt, and other debris.
2. Remove rubber deposits, existing paint markings, and other coatings.

D. Temporary Markings: Apply as directed by Architect.
E. Apply paint stencils by type and color at necessary intervals.

1.19 INSTALLATION

A. General:

1. Position pavement markings as indicated on drawings.
2. Field location adjustments require approval of Architect.
3. Allow traffic movement without hindrance.

B. Painted Pavement Markings:

1. Apply in accordance with manufacturer's instructions.
2. Apply in accordance with Pennsylvania Department of Transportation (Penn-DOT) standards.
3. Apply in accordance with FHWA MUTCD standards.
4. Obliterating Paint: Apply as necessary to cover existing markings completely.
5. Marking Paint: Apply uniformly, with sharp edges.
   a. Applications: One coat.
6. Wet Film Thickness: 0.015 inch (0.4 mm), minimum.
7. Stencils: Lay flat against pavement, align with striping, remove after application.
8. Glass Beads: Apply directly to paint, 10 second lag time, 6 lbs/gal (720 g/L) of paint, uniform thickness and coverage.
9. Length Tolerance: Plus or minus 3 inches (75 mm).
10. Width Tolerance: Plus or minus 1/8 inch (3 mm).

1.20 TOLERANCES

A. Maximum Variation From True Position: 3 inches (76 mm).
B. Maximum Offset From True Alignment: 3 inches (76 mm).

1.21 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.
B. Perform field inspection for deviations from true alignment or material irregularities.
C. If inspections indicate work does not meet specified requirements, rework and reinspect at no cost to Owner.
D. Allow the pavement marking to set at least the minimum time recommended by manufacturer.

1.22 CLOSEOUT ACTIVITIES

A. See Section 017800 - Closeout Submittals for additional requirements.
B. Temporary Markings: Remove without damaging surfaces.

1.23 PROTECTION

A. Prevent approaching traffic from crossing newly applied pavement markings.
B. Replace damaged or removed markings at no additional cost to Owner.
C. Preserve survey control points until pavement marking acceptance.

END OF SECTION 321723

SECTION 087100

DOOR HARDWARE

PART 1 - GENERAL

1.1 STIPULATIONS

A. The specifications sections “General Conditions to the Construction Contract”, “Special Conditions”, and “Division 01 – General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 SUMMARY

A. Section includes:

1. Mechanical door hardware for swinging doors and coiling doors.

B. Products furnished, but not installed, under this Section include the products listed below. Coordinating and scheduling the purchase and delivery of these products remain requirements of this Section.

1. Permanent lock cores to be installed by the Client Agency.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
2. Content: Include the following information:
   a. Identification number, location, hand, size, and material of each door and frame.
   b. Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
   c. Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Professional, and Client Agency about door hardware and keying.

B. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

C. Accessibility Requirements: For door hardware on doors in an accessible route, comply with ICC/ANSI A117.1.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. Comply with the following maximum opening-force requirements:
3. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver keys and permanent cores to the Client Agency by registered mail or overnight package service.

1.6 WARRANTY

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

1. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.
   a. Exit Devices: Five years from date of Substantial Completion.
   b. Manual Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:

1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.

C. All locks shall be furnished with removable core cylinders, and shall be a factory recorded continuation or extension of an existing keying system previously furnished for this institution.

1. New building: A new keying schedule shall be started in accordance with Paragraph E. The keying records for both new buildings and existing buildings belong to the

Commonwealth of Pennsylvania and on request, in writing, will be furnished in accordance with Paragraph B.

2. Existing system where small quantities of cores are required: The Institution shall specify the keyway required and uncombinated cores and key blanks needed. The combinating will be done by the Institution.
3. Existing system where large quantities of cores are required: The Institution shall furnish the keying records to the Director of the Key Record Department of the Lock Company, so that cores can be combinated in the factory and in accordance with paragraph B.

D. The Key Coding records shall be sent by Registered Mail to the Institution's Facility Maintenance Manager at the completion of the Project. These records shall go directly from the Manufacturer to the Institution and shall not pass through the hands of the Hardware Distributor.

E. Cylinders shall be furnished complete with collars, construction cores, 7-pin interchangeable cores, and two keys per cylinder. Cylinders shall be of correct type and length, fitted with correct cam or bar for operation of lock, and furnished with back plates and screws where required.

F. Construction cores shall be supplied to the General Contractor during the period of construction. These construction cores shall be returned to the Manufacturer after the permanent master keyed cores are installed.

G. Cores are to be Grand Master Keyed, Master Keyed, Keyed alike in Groups, and/or Keyed individually, as approved by the Institution. A Keying Schedule showing each door location, Manufacturer's lock number, Manufacturer's cylinder type number, finish, length, cam or bar type, and keying detail, shall be prepared by the Cylinder Manufacturer's Representative for the Hardware Supplier, and submitted to the Institution for approval. The Cylinder Manufacturer's Representative shall provide technical assistance and information to the Institution in establishing the keying system. Master keyed cores shall be installed by the General Contractor.

H. Furnish six (6) Master Keys for each group. Furnish six (6) Grand Master Keys and one (1) Control Key, if a new Grand Master Key System is established. The above keys shall be included with the shipment of permanent cores.

2.2 HANGING DEVICES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:
   a. Hager Companies (Basis of Design).
      1) Product: BB1279 Series.
   b. Stanley Commercial Hardware; Div. of The Stanley Works.
      1) Product: FBB179 Series.
   c. Best
   d. Or equal as approved by the Professional
2. Hinge Mounting: Full mortise.
3. Hinge Size: 4-1/2 inches by 4-1/2 inches.
4. Square corners.
5. Provide non-removable pins when hinge barrel is located on non-secure side of door.

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a

minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:
   a. Bommer Industries (BO).(Basis of Design)
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
   c. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
   d. Or equal as approved by the Professional

2.3 MECHANICAL OCKS AND LATCHES

A. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.

B. Manufacturer: Provide products by Best Access Systems, an Assa Abloy Company.

1. Locksets shall be compatible with the Institution’s existing standard Best interchangeable cores.

2. The above item has been approved by the Department as a proprietary item. No other item will be accepted. Section 9.6 and 9.7 of the General Conditions to the Construction Contract does not apply to the above item.

C. Bored Locks: BHMA A156.2; Grade 1. 4000 Series.

1. Product: 9K Series.

D. Lever Handle: Design as selected by the Professional from full range, of available styles.

E. Dummy Trim: Match lever design selected for project.

2.4 EXIT DEVICES AND AUXILIARY ITEMS

A. Exit Devices and Auxiliary Items: BHMA A156.3.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:
   a. Allegion
   b. Corbin Russwin
   c. Von Duprin; an Ingersoll-Rand company.(Basis of Design)
   d. Product: 98 Series.
      1) Rim exit device.
      2) Smooth case.
      3) Cylinder dogging.
      4) Vertical rod where indicated for inactive leaf operation.
      5) Lever trim on secure side of door as selected by the Professional from full range of available styles.

e. Or equal as approved by the Professional

2.5 LOCK CYLINDERS

A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.

1. Manufacturer: Best Access Systems (AGS Standard).

2. Cylinders shall be compatible with the Institution's existing standard Best interchangeable cores.

B. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 5 construction master keys.

C. The above item has been approved by the Department as a proprietary item. No other item will be accepted. Section 9.6 and 9.7 of the General Conditions to the Construction Contract does not apply to the above item.

2.6 OPERATING TRIM

A. Operating Trim: BHMA A156.6; stainless steel, unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. IVES Hardware; an Ingersoll-Rand company. (Basis of Design)
      1) Product: Flush Pull 962.
   b. Rockwood Manufacturing Company.
      1) Product: RM94.
   c. Best
   d. Or equal as approved by the Professional.

2.7 ACCESSORIES FOR PAIRS OF DOORS

A. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release.

1. Provide filler bar so that combined length of coordinator and filler bar matches door width.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Ingersoll-Rand Company. (IR)
      1) Series: COR Coordinators and filler bar.
   b. Rockwood Manufacturing Company: (RM)
      1) Series: 1600 Coordinators and filler bar.
   c. Trimco.
      1) Product: 3094 and filler bar.

2.8 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Manufacturers: Subject to compliance with requirements, provide products by the following, or equal as approved by the Professional:

   a. Von Duprin

   b. TruDoor

   c. LCN Closers; an Ingersoll-Rand company.(Basis of Design)

      Series: 4040XP Heavy-duty Closer (Basis of Design).
      Provide parallel arm when closer is mounted on push side of door.
      Provide plated cover for closer mechanism.

   d. Or equal as approved by the Professional

2.9 MECHANICAL STOPS AND HOLDERS

A. Wall-Mounted Stops: BHMA A156.16; polished wrought stainless steel base metal.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal as approved by the Professional:
   a. IVES Hardware; an Ingersoll-Rand company (Basis of Design).
      1) Product: 407-1/2 Wall Door Stop.
   b. Rockwood Manufacturing Company.
      1) Product: 409/410/411 Series.
   c. McMaster Carr
   d. Or equal as approved by the Professional

2.10 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders: BHMA A156.8.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or equal as approved by the Professional:

   a. Glynn-Johnson; an Ingersoll-Rand company (Basis of Design).
      1) Products:
         a) Concealed: 100 Series.
   b. Rockwood Manufacturing Company.
      1) Products:
         a) Concealed: Series 11000.
   c. Ives
   d. Or as approved by the Professional.

2.11 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following :
    a. National Guard Products.(Basis of Design)
        1) Product: 5050 Silicone bulb.
    b. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
        1) Product: S88 Silicone gasketing.
    c. Reese Enterprises, Inc.
        1) Product: 638 Series.
    d. Or equal as approved by the Professional

C. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

D. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

E. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following :

1. National Guard Products (NG).
2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
3. Reese Enterprises, Inc. (RE).
4. Or equal as approved by the Professional.

2.12 THRESHOLDS

A. Thresholds: Multi-part assembly consisting of threshold rest(s) and grooved plate with thermal break; fabricated as indicated on drawings.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:
    a. National Guard Products.
    b. Pemko Manufacturing Co.; an ASSA ABLOY Group company (Basis of Design).
        1) Type 1:
            a) Floor Plate/Safety Tread 200.
            b) Floor Plate/Safety Tread 19325 (6-1/2 inches wide). Provide thermal break within grooved plate.
    c. Reese Enterprises, Inc.
    d. Zero International.
    e. Or equal as approved by the Professional.

2. Total Assembly Width: Full width of opening indicated.
3. Depth: Match wall depth.
4. Cope around frame jamb.

2.13 METAL PROTECTIVE TRIM UNITS

A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch-thick stainless steel; with manufacturer's standard machine or self-tapping screw fasteners.

1. Height: 6 inches, unless otherwise noted.
2. Width:
   a. Two inches less than door width on stop side of door.
   b. One inch less than door width on non-stop side of door.
3. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following: :
   a. IVES Hardware; an Ingersoll-Rand company.
   b. Rockwood Manufacturing Company.
   c. Trimco Architectural Hardware.
   d. Or equal as approved by the Professional

2.14 AUXILIARY DOOR HARDWARE

A. Hat and Coat Hook Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:

1. Manufacturer: Hafele America Co.
   Product: 842.02.906 (Basis of Design).
2. McMaster-Carr
3. Gamco
4. Or equal as approved by the Professional.

2.15 AUXILIARY ELECTRIFIED DOOR HARDWARE

A. Manufacturers: : Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following:

1. DORMA Architectural Hardware; a division of DORMA Group North America.
2. Hager Companies.
3. Horton Automatics.
4. Von Duprin; an Ingersoll-Rand company.

B. Products:
1. Wireless receiver (interior).
2. Electrical Power Transfer EPT-2.
3. Flex loop.
4. Request to Exit Device:
   a. Manufacturer: Honeywell.
5. Power Supply Series PS873.
6. Door Position Sensor (DPS).
7. Security Operator (provided by Owner).
8. Junction Boxes.

2.16 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

2.17 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

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

PART 3 - EXECUTION

3.1 INSTALLATION

A. Steel Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

B. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.

C. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

D. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent.

E. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Furnish permanent cores to the Client Agency for keying and installation.

F. Perimeter Gasketing: Apply to head and jambs, forming seal between door and frame.
1. At double doors, apply to astragal.

G. Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

DOOR HARDWARE SCHEDULE

Door Hardware Set No. 1

Location: Single Exterior Exit Door (Doors 102-2, 103-2, 121-1, 122-1)

Qty.	Description	Item	Finish
1	Hanging Devices	Geared Continuous Hinge	626
1	Exit Device	Rim Exit Device with Lever	630
2	Securing Device	Key Cylinder	626
1	Protective Trim Units	Kickplate	630
1	Closer	Surface Closer with Stop and Hold Open	626
1 set	Miscellaneous	Weatherstripping	
1	Miscellaneous	Door Sweep	
1	Miscellaneous	Threshold	Aluminum

Door Hardware Set No. 2

Location: Single Interior Door Office Function (Doors 104-1, 112-1, 113-1, 114-1, 115-1)

Qty.	Description	Item	Finish
3	Hanging Devices	Hinges	626
1	Securing Device	Cylindrical Lockset Office Function	626
1	Securing Device	Key Cylinder	
2	Protective Trim Units	Kick plate	630
1	Miscellaneous	Wall Stop	
2	Accessories	Hat and Coat Hook	
	Miscellaneous	Silencers	

Door Hardware Set No. 3

Location: Single Interior Door -Privacy Function (Door 116-1)

Qty.	Description	Item	Finish
3	Hanging Devices	Hinges	626
1	Securing Device	Cylindrical Lockset Privacy Function	626
1	Securing Device	Key Cylinder	
2	Protective Trim Units	Kick plate	630
1	Closer	Surface Closer with Hold open	626
1	Miscellaneous	Wall Stop	
2	Accessories	Hat and Coat Hook	
	Miscellaneous	Silencers	

Door Hardware Set No. 4

Location: Single Interior Door in Restroom (Doors 106-1, 117A-1, 117-1, 118A-1, 118-1)

Qty.	Description	Item	Finish
3	Hanging Devices	Hinges	626
1	Securing Device	Cylindrical Lockset Passage Function	626
1	Securing Device	Key Cylinder	
2	Protective Trim Units	Kick plate	630
1	Closer	Surface Closer with Hold open	626
1	Miscellaneous	Wall Stop	
2	Accessories	Hat and Coat Hook	
	Miscellaneous	Silencers	

Door Hardware Set No. 5

Location: Single Interior Door - Storeroom Function (Doors 107-1,109-1, 110-1, 120-1)

Qty.	Description	Item	Finish
3	Hanging Devices	Hinges	626
1	Securing Device	Cylindrical Lockset Storeroom Function	626
1	Securing Device	Key Cylinder	
2	Protective Trim Units	Kick plate	630
1	Miscellaneous	Wall Stop	
1	Miscellaneous	Silencers	

Door Hardware Set No. 6

Location: Building Entrance (Door 101-3)

Qty.	Description	Item	
2	Hanging Devices	Continuous Geared Hinge	
1	Exit Device (active leaf)	Rim Exit Device	630
1	Exit Device (inactive leaf)	Rim Exit Device (exposed vertical rod), blank exterior.	630
1	Securing Device	Key Cylinder	630
2	Operating Trim	Vertical Rod Pull	
1	Closer (inactive leaf)	Surface-mounted closer with Stop.	630
4	Protective Trim Units	Metal Kickplate	630
1	Accessories	Coordinator and Filler Bar	
1	Miscellaneous	Automatic Door Operator	
1	Miscellaneous	Door Switch (Exterior)	630
1	Miscellaneous	Door Switch (Interior)	630
1	Miscellaneous	Wall Actuator (Secure)	630
1	Miscellaneous	Wall Actuator (Non-secure)	630
1	Miscellaneous	Wireless Receiver	
1	Miscellaneous	Threshold - Type 1	Mill
1	Miscellaneous	Bollard Post	630
1	Miscellaneous	Electric Strike	
1	Miscellaneous	Flex Loop	
1	Miscellaneous	Card Reader (by Owner)	Black
1	Miscellaneous	Request to Exit Device	
1	Miscellaneous	Door Position Sensor	
2	Miscellaneous	Door Sweep	630
	Miscellaneous	Weatherstripping	

Door Hardware Set No. 7

Double Doors From Entry (Doors 101-1, 101-2)

Qty.	Description	Item

8	Hanging Devices	Hinge	626
1	Securing Device (active leaf)	Key Cylinder	626
1	Securing Device (active leaf)	Bored Lockset, Entrance function	626
1	Securing Device (inactive leaf - bottom)	Manual Flush Bolt with dust-proof strike	626
1	Securing Device (inactive leaf - top)	Automatic Flush Bolt	626
1	Closer (active leaf)	Surface closer with stop function.	626
2	Operating Trim (inactive leaf)	Flush Pulls	626
4	Protective Trim Units	Metal Kickplate	630
1	Holder or Stop	Wall Bumper	626
1	Accessories for Pairs of Doors	Astragal	630

Door Hardware Set No. 8

Double Doors into Storage (Doors 103-1)

8	Hanging Devices	Hinge
1	Securing Device (active leaf)	Key Cylinder
1	Securing Device (active leaf)	Bored Lockset, Storeroom function
1	Securing Device (inactive leaf - bottom)	Manual Flush Bolt with dust-proof strike
1	Securing Device (inactive leaf - top)	Constant-Latching Flush Bolt
1	Closer	Surface closer with stop function
2	Operating Trim (inactive leaf)	Flush Pulls
2	Protective Trim Units	Metal Kickplate
2	Miscellaneous	Hat and Coat Hook

Door Hardware Set No. 9
Single Door into Weapons Vault, with Card Reader Access (Wall Bumper), *Fail-Secure Operation* (Door 105-1)

Qty.	Description	Item	
4	Hanging Devices	Hinge	626
1	Securing Device	Bored lockset, Storeroom function.	626
1	Securing Device	Key Cylinder	626
1	Closer	Surface closer with stop function	626
2	Protective Trim Units	Metal Kickplate	630
1	Holder or Stop	Wall Bumper	626
1	Miscellaneous	Electric Strike	
1	Miscellaneous	Card Reader (by Owner)	
2	Miscellaneous	Hat and Coat Hooks	
1 set	Miscellaneous	Perimeter Gasketing	

Door Hardware Set No. 10
Location: Overhead Coiling Door (Door 102-1, 103-3)

Qty.	Description	Item	Finish
1	Securing Device	Key Cylinder	

Door Hardware Set No. 11
Single Door to Exterior (Door 111-1, 120-2)

Qty.	Description	Item

4	Hanging Devices	Hinge
1	Securing Device	Bored Lockset with Entrance function
1	Securing Device	Key Cylinder
1	Closer	Surface Closer with Stop
2	Protective Trim Units	Metal Kickplate
1	Miscellaneous	Threshold - Type 2
1	Miscellaneous	Door Position Sensor
1	Miscellaneous	Door Sweep
1 set	Miscellaneous	Weatherstripping

END OF SECTION 087100

Section 334211

STORMWATER GRAVITY PIPE

PART 1 GENERAL

1.1 STIPULATIONS

A. The specifications sections “General Conditions to the Construction Contract”, “Special Conditions” and “Division 01 - General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 SECTION INCLUDES

A. Stormwater drainage piping.
B. Stormwater pipe accessories.

1.3 RELATED REQUIREMENTS

A. Sections:

1. Section 033000 - Cast-in-Place Concrete: Concrete for cleanout base pad construction.
2. Section 312316 - Excavation: Excavating of trenches.
3. Section 312316.13 - Trenching: Excavating, bedding, and backfilling.
4. Section 312323 - Fill: Bedding and backfilling.
5. Section 330561 - Concrete Manholes.
6. Section 334230 - Stormwater Drains.
7. Section 334600 - Stormwater Management.

1.4 PRICE AND PAYMENT PROCEDURES

~~A. See Section 012200 - Unit Prices, for additional unit price requirements.~~
~~B. Pipe and Fittings:~~

~~1. Basis of Measurement: By the linear feet.~~
~~2. Basis of Payment: Includes hand trimming excavation, bedding and backfilling, pipe and fittings, connection to building service piping and to municipal system.~~

1.5 REFERENCE STANDARDS

A. ASTM Specifications:

1. ASTM C14 - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe; 2020.
2. ASTM C14M - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe (Metric).; 2020.
3. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe; 2022a.

4. ASTM C76M - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Metric); 2022a.
5. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets; 2021.
6. ASTM C443M - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric); 2021.ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2020a.

1.6 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of stormwater gravity piping with size, location and installation of stormwater drains according to Section 334230.
B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.
C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.7 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data indicating pipe, pipe accessories,
C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
D. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.
E. Field Quality Control Submittals: Document results of field quality control testing.
F. Project Record Documents
G. Record location of pipe runs, connections, and invert elevations. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

PART 2 PRODUCTS

2.1 STORMWATER PIPE MATERIAL

A. Provide products that comply with applicable code(s).
B. Corrugated Steel Pipe: AASHTO M 36 Type I; nominal diameter of 24 inches, 24 in end joints; helical lock seam; coated inside and out with 0.050 inch (1.3 mm) thick bituminous coating.
C. Coupling Bands: Galvanized steel, 0.052 inches (1.3 mm) thick x 10 inches (250 mm) wide; connected with two neoprene "O" ring gaskets and two galvanized steel bolts.

2.2 PIPE ACCESSORIES

A. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.
B. Finish: Manufacturer's standard factory applied powder coat finish.
C. Color: To be selected by Architect from manufacturer's standard range.
D. Accessories: Manufacturer's standard stainless steel fasteners, stainless steel building wall anchors, and rubber coupling.

2.2 STORMWATER MANHOLES

A. Manholes shall be brick, cast-in-place concrete, or precast reinforced concrete manhole

B. sections. Manholes built into sanitary sewers with inverts below elevation 0.00 City datum or into any
C. intercepting sewers shall be restricted to cast-in-place concrete or precast reinforced concrete sections.
D. Manholes shall be constructed with steps and/or ladder bars from the inverts of the sewer or stormwater conduit to the top of the manhole.
E. Manholes built into sanitary sewers or combined sewers shall be fitted with cast iron frames and solid covers. Manhole built into stormwater conduits shall be fitted with cast iron frames and solid or vented covers.

PART 3 - EXECUTION

3.1 TRENCHING

A. See Section 312316 - Excavation and Section 312323 - Fill for additional requirements
B. Hand trim excavation for accurate placement of pipe to elevations indicated.
C. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.2 INSTALLATION

A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.
B. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal
C. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch (3 mm) in 10 feet (3 m).
D. Connect to building storm drainage system, foundation drainage system, and utility/municipal system.
E. Make connections through walls through sleeved openings, where provided.
F. Install continuous trace wire 6 inches (150 mm) above top of pipe; coordinate with Section 312316.13.

3.3 FIELD QUALITY CONTROL

A. Perform field inspection in accordance with Section 014000 - Quality Requirements.
B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

3.4 PROTECTION

A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

END OF SECTION 334211

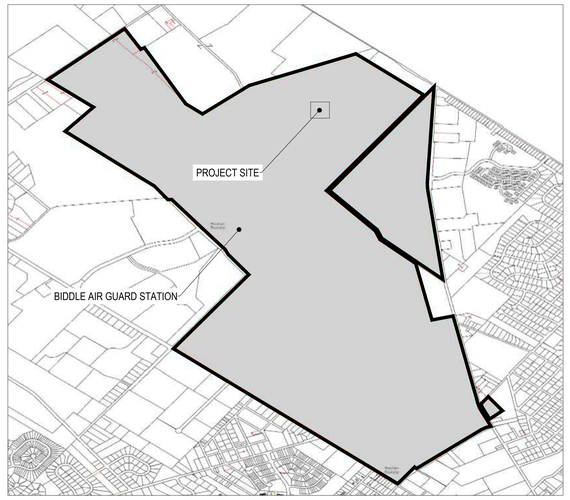
PA NAD83 (2011) SOUTH ZONE

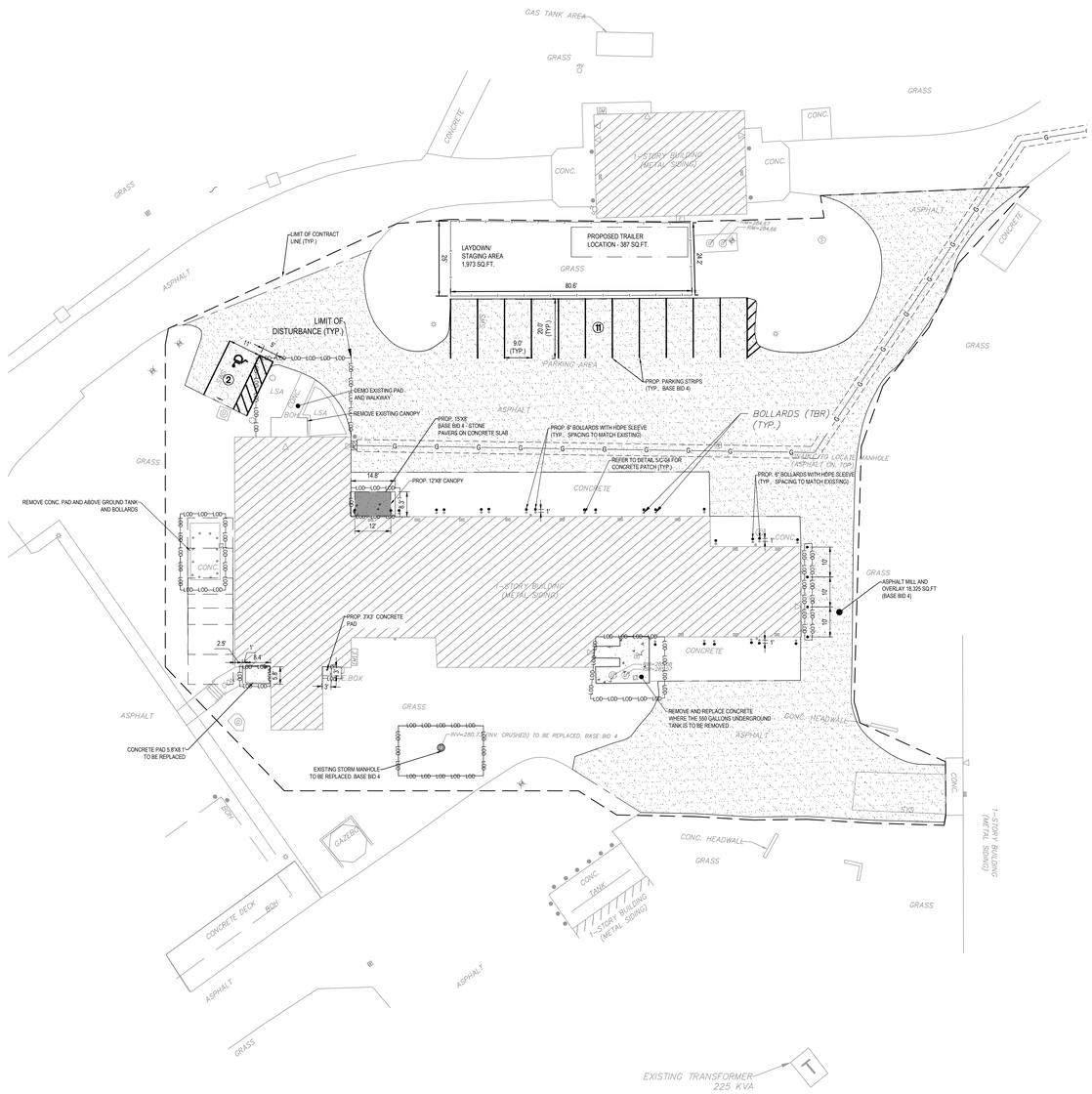
SURVEY NOTES:

1. THE SURVEY IS BASED UPON PHYSICAL CONDITIONS FOUND AT THE SUBJECT SITE, AND THE FOLLOWING REFERENCES
   1.1. *SITE PLAN - ELECTRICAL, VEHICLE MAINTENANCE FACILITY BY LS DESING GROUP, P.C. DATED JANUARY 27, 1984.
   1.2. *SITE PLAN & DETAILS, VEHICLE MAINTENANCE FACILITY BY LS DESING GROUP, P.C. DATED JANUARY 27, 1984.
2. TOPOGRAPHIC & UTILITY INFORMATION SHOWN BASED ON A FIELD SURVEY PERFORMED BY LANGAN ENGINEERING & ENVIRONMENTAL SERVICES DURING AUGUST 2023.
3. THE MERIDIAN IS REFERENCED TO THE PENNSYLVANIA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM 1983 (NAD83).
4. VERTICAL DATUM IS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88).
5. OFFSETS (IF SHOWN) ARE FOR SURVEY REFERENCES ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION OF ANY TYPE.
6. BOUNDARY, WETLANDS, ENVIRONMENTAL AND/OR HAZARDOUS MATERIALS LOCATION, IF ANY, NOT COVERED UNDER THIS CONTRACT.
7. UNLESS SPECIFICALLY NOTED HEREON, STORM AND SANITARY SEWER INFORMATION (INCLUDING PIPE INVERT, PIPE MATERIAL, AND PIPE SIZE) WAS OBSERVED AND MEASURED AT FIELD LOCATED STRUCTURES (MANHOLES/CATCH BASINS, ETC.). CONDITIONS CAN VARY FROM THOSE ENCOUNTERED AT THE TIMES WHEN AND LOCATIONS WHERE DATA IS OBTAINED. DESPITE MEETING THE REQUIRED STANDARD OF CARE THE SURVEYOR CANNOT AND DOES NOT WARRANT THAT PIPE MATERIAL AND/OR PIPE SIZE THROUGHOUT THE PIPE RUN ARE THE SAME AS THOSE OBSERVED AT EACH STRUCTURE, OR THAT THE PIPE RUN IS STRAIGHT BETWEEN THE LOCATED STRUCTURES. ADDITIONAL UTILITY (WATER, GAS, ELECTRIC ETC) DATA MAY BE SHOWN FROM FIELD LOCATED SURFACE MARKINGS (BY UNDERGROUND SERVICES, INC.), EXISTING STRUCTURES, AND/OR FROM EXISTING DRAWINGS, UNLESS SPECIFICALLY NOTED HERE-ON THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE SHOWN UNDERGROUND UTILITIES ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE, NOR ARE IN THE EXACT LOCATION OR CONFIGURATION INDICATED HEREON. PRIOR TO ANY DESIGN OR CONSTRUCTION THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION OF UTILITY TYPE AND FOR FIELD LOCATIONS.
8. THIS PLAN IS NOT VALID UNLESS STAMPED WITH THE SEAL OF THE UNDERSIGNED PROFESSIONAL OR DIGITAL SIGNED AND SEALED.

GENERAL NOTES:

1. BUILDING 237 IS PART OF BIDDLE AIR GUARD STATION PROPERTY. THE PARCEL ID FOR THE PROPERTY IS 360004050009.
2. THE TOTAL TRACT ACREAGE OF THE BIDDLE AIR GUARD STATION PER PROPERTY RECORD IS 1006.32 ACRES
3. THE PROPOSED ACREAGE OF THE SITE IMPROVEMENT IS 0.0093 ACRES (404 SQFT)





LEGEND
DEMO
BUILDING OVERHANG
CONCRETE PAD
BOLLARD

LEGEND
EXISTING
BUILDING
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WALL
BOLLARD
FENCE
PAVEMENT MARKING
GUARD RAIL
LIGHT
MONITORING WELL
GAS METER
ELECTRIC MANHOLE
STORM MANHOLE
SANITARY MANHOLE
ELECTRIC METER
FIRE HYDRANT
ELECTRIC METER
SEWER
DOOR
GAS VALVE
TREE/ BUSH

LEGEND
PROPOSED
BUILDING CANOPY
CONCRETE SIDEWALK
SANITARY MANHOLE
ASPHALT MILL & OVERLAY
BOLLARD
GAS LINE
EDGE OF TRENCH
LIMITS OF DISTURBANCE
STAGING/ LAYDOWN AREA
PROPOSED TRAILER
LIMIT OF CONTRACT LINE
PROJECT BOUNDARY LINE

ASPHALT MILL AND OVERLAY GENERAL NOTES:

1. HATCHED AREA = 18,325 SQ FT TO MILL & OVERLAY.
2. PAINT & RE-STRIPE NEW PARKING LAYOUT.
3. AREAS OF DISTURBED GROUND TO BE REGRADED WITH STORM DRAINAGE SLOPE MIN 2% TO MAINTAIN POSITIVE DRAINAGE.
4. MATCH UP TO EXISTING PAVING.
5. CONTRACTOR TO REMOVE EXISTING BOLLARDS, BACKFILL AND PATCH WITH CONCRETE.

JURISDICTION	# OF PARKING SPOTS	REQUIRED # OF HANDICAP PARKING SPOTS	STALL WIDTH	STALL LENGTH
HORSHAM TOWNSHIP	13	1	9 feet	20 feet

10/11/2024 - ADDENDUM #3			

RECORD REVISIONS

Construction Documents – August 26, 2024

REGISTERED PROFESSIONAL ENGINEER — JAMES C. GLEATON JR. — ENGINEER PE035010E — COMMONWEALTH OF PENNSYLVANIA

PROFESSIONAL ENGINEER EXPIRES 09-30-2025

SIGNATURE

10/11/2024
DATE

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
DGS C-0961-0044 PHASE 01

BUILDING 237 RENOVATION
BIDDLE AIR GUARD STATION
HORSHAM, PA 19044

SITE & DEMO PLAN

PENNSYLVANIA ONE CALL SYSTEM, INC. 1-800-242-1776 DIAL 8-1-1 BEFORE YOU DIG

PENNSYLVANIA ACT 287 REQUIRES NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE COMMONWEALTH

GRAPHIC SCALE
0 20 40 60
(IN FEET)
1 inch = 20 ft.

VERIFY SCALE

BAR IS ONE (1) INCH LONG ON ORIGINAL DRAWING:
0 1
IF BAR IS NOT ONE (1) INCH LONG, ADJUST SCALE ACCORDINGLY

CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. VARIANCE FROM CONTRACT DOCUMENTS NOT PERMITTED WITHOUT PROFESSIONAL & BUREAU OF CONSTRUCTION APPROVAL.

DRAWN BY	DATE	DRAWING No.
JYL	08/26/2024	C-01
CHECKED BY	SCALE	
JG	AS NOTED	

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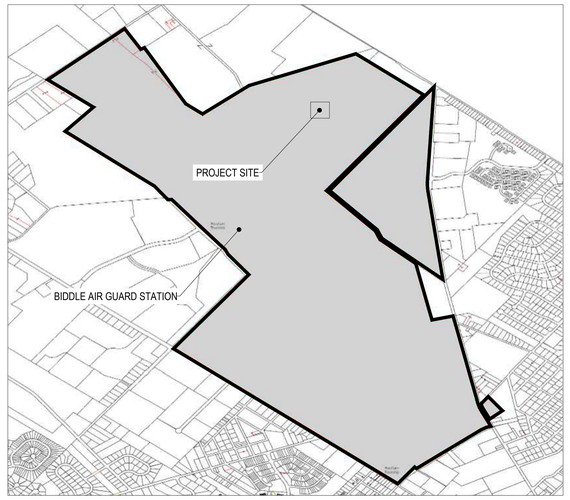

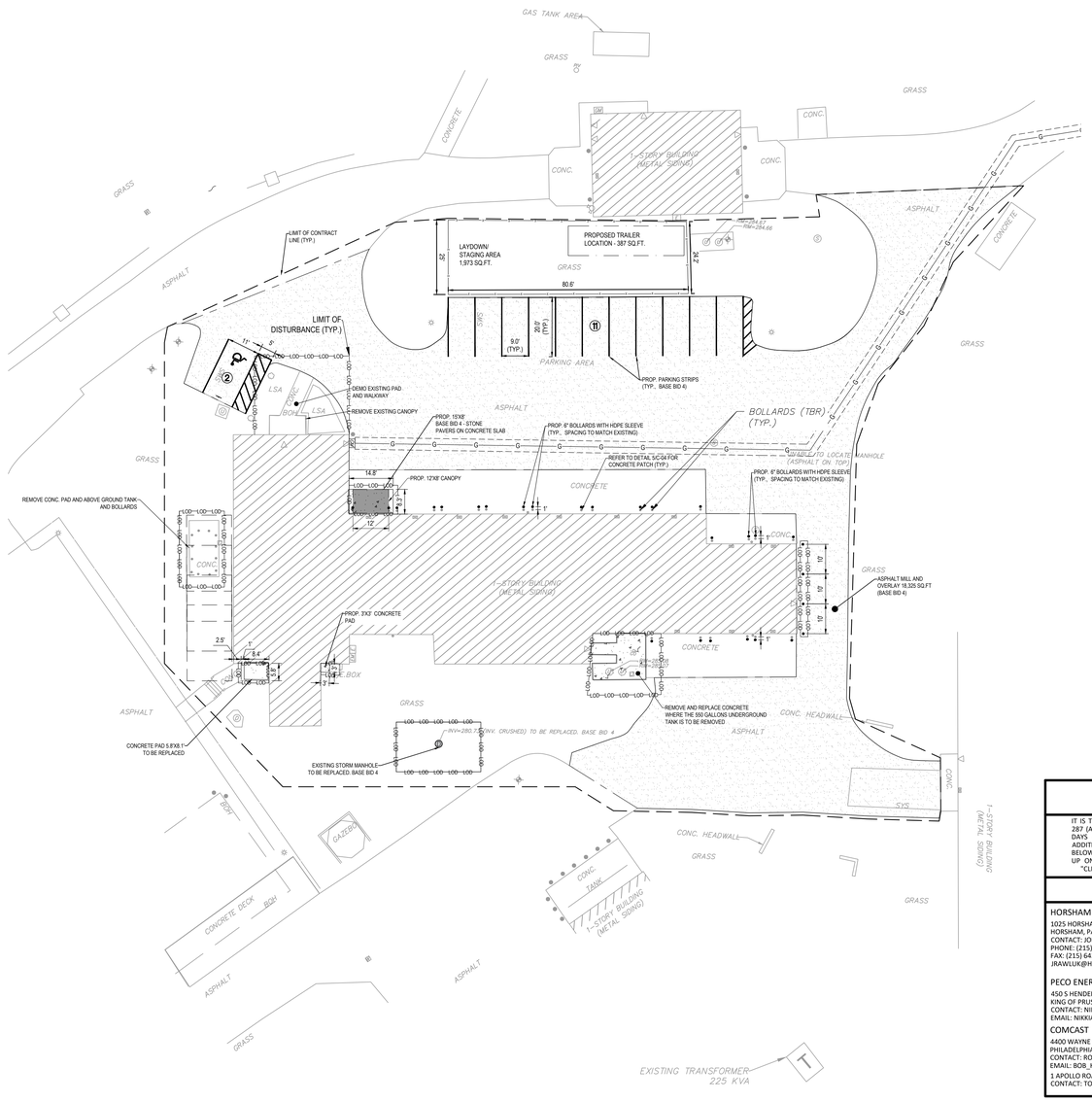

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JURISDICTION	# OF PARKING SPOTS	REQUIRED # OF HANDICAP PARKING SPOTS	STALL WIDTH	STALL LENGTH
HORSHAM TOWNSHIP	10	1	9 feet	20 feet

UTILITY USER LIST
ACT NUMBER 287 OF 1974 AS AMENDED

IT IS THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH THE PENNSYLVANIA ACT 287 (AS AMENDED) AND TO CONTACT THE "ONE CALL SYSTEM" THREE (3) WORKING DAYS (UNLESS OTHERWISE NOTED) PRIOR TO THE START OF CONSTRUCTION. ADDITIONAL TELECOMMUNICATIONS/FIBER OR OTHER UTILITY PROVIDERS (USTED BELOW) MAY HAVE FACILITIES WITHIN RENTED DUCTS AND MAY OR MAY NOT SHOW UP ON THE ONE CALL LIST. IN ADDITION, IF THERE ARE RESPONSES SHOWN AS "CLEAR-NO FACILITIES" TO A ONE CALL REQUEST, THERE STILL MAY BE A CONFLICT.

PENNSYLVANIA ONE CALL: 1-800-242-1776
SERIAL NO: 20241433927

HORSHAM TOWNSHIP
1025 HORSHAM ROAD
HORSHAM, PA 19044
CONTACT: JOHN RAWLUK
PHONE: (215) 643-3131
FAX: (215) 643-0448
JRAWLUK@HORSHAM.ORG

HORSHAM WATER AND SEWER AUTHORITY - MAIN OFFICE
617 HORSHAM ROAD
HORSHAM, PA 19044
CONTACT: MICHAEL HEALEY
PHONE: (215) 672-8011
EMAIL: CONTACT@HORSHAMWATER-SEWER.COM

PECO ENERGY C/O USIC
450 S HENDERSON RD SUITE B
KING OF PRUSSIA, PA 19406
CONTACT: NIKKIA SIMPKINS
EMAIL: NIKKIASIMPKINS@USICLLC.COM

TRANSCONTINENTAL GAS/ WILLIAMS GAS
99 FARBER RD
PRINCETON, NJ 08540
CONTACT: JUSTIN ADAMS
EMAIL: JUSTIN.ADAMS@WILLIAMS.COM

COMCAST
4400 WAYNE AVENUE
PHILADELPHIA, PA 19140
CONTACT: ROBERT HARVEY
EMAIL: BOB_HARVEY@CABLE.COMCAST.COM
1 APOLLO ROAD PLYMOUTH MEETING, PA 19462
CONTACT: TOM DEMSEY

VERIZON PENNSYLVANIA LLC
1050 VIRGINIA DR
FORT WASHINGTON, PA 19034
CONTACT: VICTOR WOOD
EMAIL: VICTOR.S.WOOD@ONE.VERIZON.COM

PENNSYLVANIA ACT 287 REQUIRES NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE COMMONWEALTH

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10/11/2024 - ADDENDUM #3		

RECORD REVISIONS
Construction Documents – August 26, 2024

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES C. GLEATON JR.
ENGINEER
PE053010E
PROFESSIONAL ENGINEER
EXPIRES 09-30-2025
SIGNATURE
10/11/2024
DATE

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

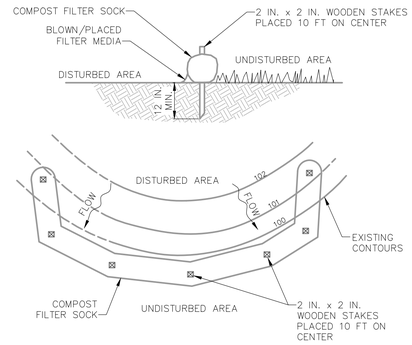
D.G.S. PROJECT No.
DGS C-0961-0044 PHASE 01

BUILDING 237 RENOVATION
BIDDLE AIR GUARD STATION
HORSHAM, PA 19044

LAND TITLE/LEASE

DRAWN BY	DATE	DRAWING No.
JYL	08/26/2024	EX-01
CHECKED BY	SCALE	
JG	AS NOTED	

PA HARDINESS SOUTH ZONE



NOTES:

SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1 OF THE PA DEP EROSION CONTROL MANUAL. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2 OF THE PA DEP EROSION CONTROL MANUAL.

COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.

TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.

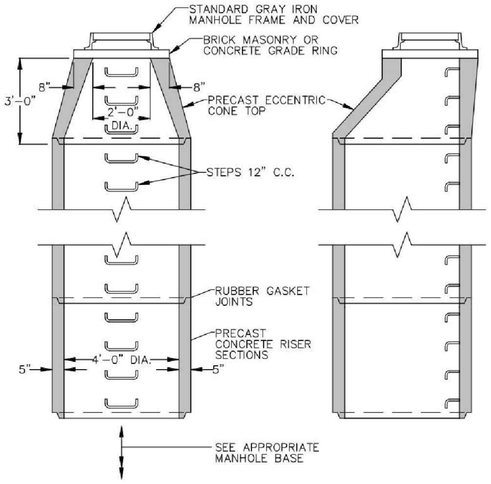
ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.

COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.

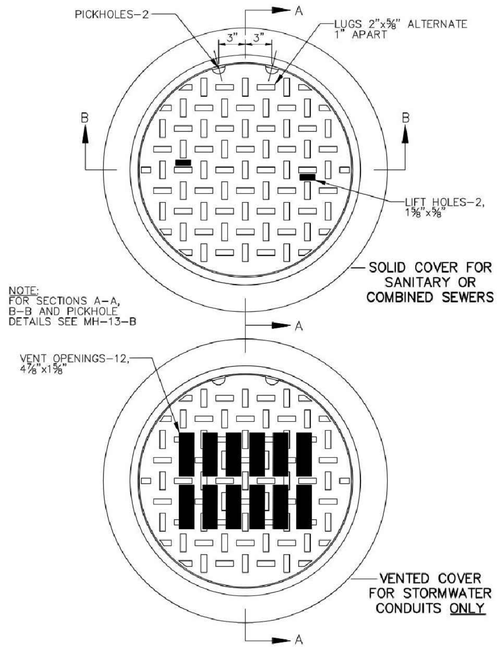
BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

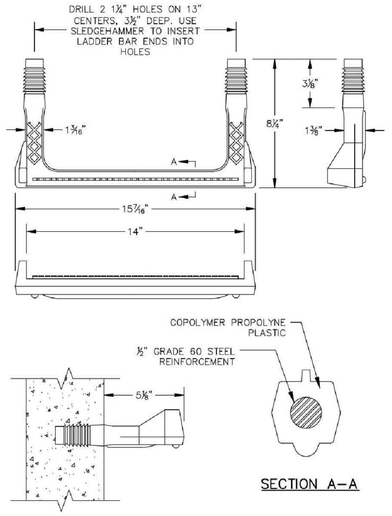
1 C-04 TYPICAL COMPOST FILTER SOCK DEVICE ON SOIL
NTS



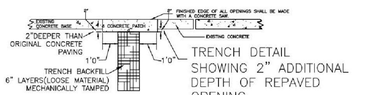
2 C-04 TYPICAL PRECAST CONCRETE MANHOLE RISER AND CONE
NTS



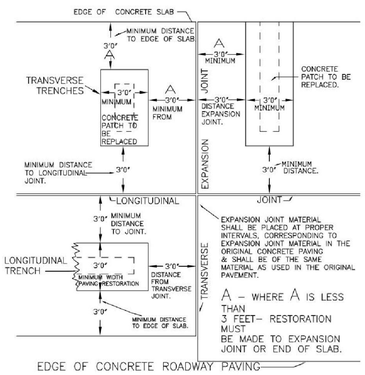
3 C-04 GRAY IRON MANHOLE FRAME AND COVERS
NTS



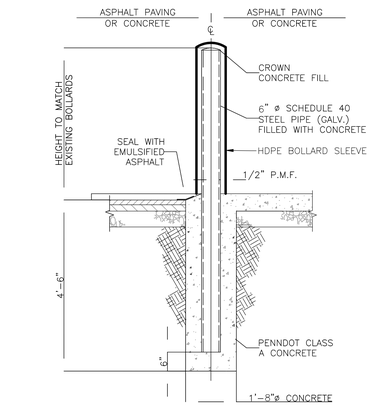
4 C-04 TYPICAL MANHOLE STEPS
NTS



TRENCH DETAIL SHOWING 2" ADDITIONAL DEPTH OF REPAVED OPENING.

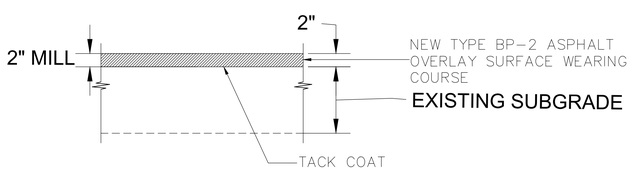


5 C-04 TYPICAL RESTORATION CONCRETE ROADWAY
NTS

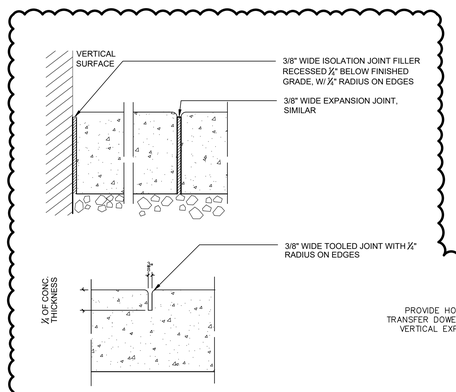


NOTES:
1. PREPARE AND PRIME GALVANIZED BOLLARDS IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION OR APPROVED EQUAL.
2. PREPARE AND APPLY EXTERIOR PAINT IN ACCORDANCE WITH MANUFACTURERS EXTERIOR PAINTING SPECIFICATION OR APPROVED EQUAL, COLOR TO BE DETERMINED BY OWNER.

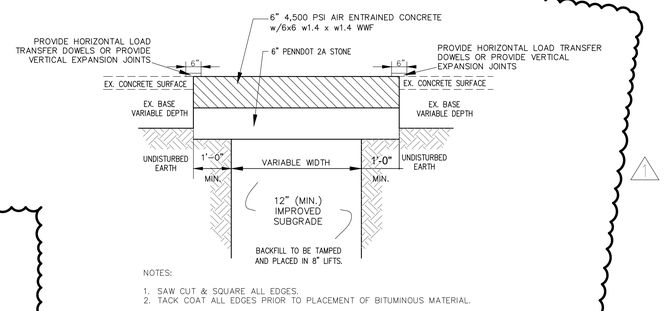
6 C-04 TYPICAL BOLLARD DETAIL
NTS



7 C-04 TYPICAL MILL AND OVERLAY
NTS

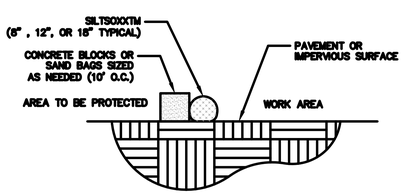


8 C-04 CONCRETE JOINT DETAIL
SCALE: NOT TO SCALE

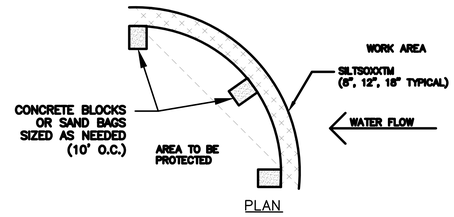


NOTES:
1. SAW CUT & SQUARE ALL EDGES.
2. TACK COAT ALL EDGES PRIOR TO PLACEMENT OF BITUMINOUS MATERIAL.

10 C-04 RESTORATION OF CONCRETE PAVEMENT DETAIL
SCALE: NOT TO SCALE



SECTION



PLAN

NOTES:
1. ALL MATERIAL TO MEET SPECIFICATIONS.
2. FILTER MEDIA TO MEET APPLICATION REQUIREMENTS.
3. FILTER MEDIA TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

9 C-04 TYPICAL COMPOST SOCK SEDIMENT CONTROL DEVICE
NTS

PENNSYLVANIA ACT 287 REQUIRES NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE COMMONWEALTH

GRAPHIC SCALE
0 20 40 60
(IN FEET)
1 inch = 20 ft.

10/11/2024 - ADDENDUM #3	

RECORD REVISIONS

Construction Documents - August 26, 2024

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES C. GLEATON JR.
ENGINEER
COMMONWEALTH OF PENNSYLVANIA

PROFESSIONAL ENGINEER EXPIRES 09-30-2025

SIGNATURE

10/11/2024
DATE

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
DGS C-0961-0044 PHASE 01

BUILDING 237 RENOVATION
BIDDLE AIR GUARD STATION
HORSHAM, PA 19044

CIVIL DETAILS

VERIFY SCALE

BAR IS ONE (1) INCH LONG ON ORIGINAL DRAWING:
0 1
IF BAR IS NOT ONE (1) INCH LONG, ADJUST SCALE ACCORDINGLY

CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. VARIANCE FROM CONTRACT DOCUMENTS NOT PERMITTED WITHOUT PROFESSIONAL & BUREAU OF CONSTRUCTION APPROVAL.

DRAWN BY	DATE	DRAWING No.
JYL	08/26/2024	C-04
CHECKED BY	SCALE	
JG	AS NOTED	