

Addendum No. 2

RFP for Health Care Center No. 10, Interior Improvements and Additions

Project No. 14-18-4745-01

2230 Cottman Avenue, Philadelphia, PA 19149

January 9, 2020

1. Specifications

000110 Table of Contents

DIVISION 2 – EXISTING CONDITIONS

020100 Project Survey and Layout
020200 Erosion and Sediment Control
022000 Site Preparation
022210 Structure Demolition
022300 Site Clearing
022310 Tree Protection and Trimming
022300 Earthwork
024113 Selective Site Clearing and Demolition
024116 Selective Building Demolition
025100 Water Distribution
025840 Underground Ducts and Utilities
026300 Storm Drainage
027510 Site Concrete
027800 Unit Paving
028260 Ornamental Metal Fence
028700 Site Furnishings
029100 Soil Preparation
029110 Planting Soil
029110 Planting Soil Submittal Transmittal
029300 Exterior Planting

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

079100 Preformed Joint Sealants

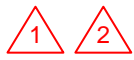
DIVISION 9 - FINISHES

090130 Tile Restoration and Cleaning
093000 Tiling
099113 Exterior Painting

DIVISION 10 - SPECIALTIES

102113 Toilet Compartments
102800 Washroom Accessories

End of Addendum



PROJECT MANUAL



**PHILADELPHIA
REDEVELOPMENT
AUTHORITY**

HEALTH CARE CENTER NO. 10
2230 COTTMAN AVENUE, PHILADELPHIA, PA 19149
INTERIOR IMPROVEMENTS AND ADDITIONS

PHILADELPHIA REDEVELOPMENT AUTHORITY









A Mandatory Pre-Bid Conference will be held on **Monday, December 30, 2019 at 10:00 AM** at Health Care Center No. 10, located at 2230 Cottman Avenue, Philadelphia, PA 19149.

Sealed Bids will be received until **2:00 PM, Thursday, January 16, 2020** at the Philadelphia Redevelopment Authority, 1234 Market Street, 16th Floor, Philadelphia, PA 19107, Attn: Robert LaBrum, Director, Design and Construction, and will be opened immediately thereafter.






















HEALTH CARE CENTER NO. 10
INTERIOR IMPROVEMENTS AND ADDITIONS

  **TABLE OF CONTENTS**

DIVISION 00 - BIDDING AND CONTRACTING REQUIREMENTS

	001100	Instructions to Bidders
	004110	Bid Proposal Form
	004313	Bid Bond
	007200	Standard Contract Requirements (City)
	007337	Economic Opportunity Plan (EOP)
	007343	Prevailing Wage Rates Schedule

DIVISION 01 -- GENERAL PROJECT REQUIREMENTS

	011200	Summary of Work
	012100	Allowances
	012500	Substitution Procedures
	012600	Contract Modification Procedures - Change Order Form
	012900	Payment Procedures
	012973	Schedule of Values
	013113	Project Coordination
	013119	Project Meetings
	013216	Construction Scheduling
	013226	Progress Reports
	013233	Construction Photographs
	013300	Submittals
	014100	Codes, Regulations and Standards
	014516	Contractor's Quality Control
	015000	Temporary Facilities and Controls
	015719	Environmental Controls
	016001	Products and Materials
	017700	Closeout Procedures -Certificate of Substantial Completion Form
	017823	Operation and Maintenance Manuals
	017836	Warranties
	017839	Project Record Documents

DIVISION 2 – EXISTING CONDITIONS

2	020100	Project Survey and Layout
2	020200	Erosion and Sediment Control
2	022000	Site Preparation
2	022210	Structure Demolition
2	022300	Site Clearing
2	022310	Tree Protection and Trimming
2	022300	Earthwork
2	024113	Selective Site Clearing and Demolition
2	024116	Selective Building Demolition
2	025100	Water Distribution
2	025840	Underground Ducts and Utilities
2	026300	Storm Drainage
2	027510	Site Concrete
2	027800	Unit Paving
2	028260	Ornamental Metal Fence
2	028700	Site Furnishings
2	029100	Soil Preparation
2	029110	Planting Soil
2	029110	Planting Soil Submittal Transmittal
2	029300	Exterior Planting

DIVISION 3 – CONCRETE

2	033000	Cast-In-Place Concrete
---	--------	------------------------

DIVISION 4 – MASONRY

1	042200	Concrete Unit Masonry
---	--------	-----------------------

DIVISION 5 – METALS

1	053000	Structural Steel
1	053100	Steel Decking
1	055000	Metal Fabrications

DIVISION 6 – WOOD, PLASTICS, AND COMPOSITES

1	061053	Miscellaneous Rough Carpentry
1	064100	Architectural Casework
1	064600	Wood Trim
1	066500	Exterior Synthetic (Poly-Ash) Trim

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

1	070152	Roof Penetrations and Patching
1	072100	Thermal Insulation
1	072726	Fluid Applied Membrane Air Barriers
1	074256	Fiber Cement Wall Panels
1	074649	Poly-Ash Siding
1	075216	SBS Modified Bituminous Roofing
1	076200	Sheet Metal Flashing and Trim
2	079100	Preformed Joint Sealants
1	079200	Joint Sealants

DIVISION 8 - OPENINGS

1	081113	Hollow Metal Doors and Frames
1	081416	Flush Wood Doors
1	083100	Access Doors and Panels
1	084113	Aluminum-Framed Entrances and Storefronts
1	084413	Glazed Alum Curtain Walls
1	085113	Aluminum Windows
1	087110	Door Hardware
1	088000	Glazing

DIVISION 9 - FINISHES

2	090130	Tile Restoration and Cleaning
1	092216	Non-Structural Metal Framing
1	092900	Gypsum Board
2	093000	Tiling
1	095113	Acoustic Panel Ceilings
1	096513	Resilient Base and Accessories
1	096516	Resilient Sheet Flooring
1	096519	Resilient Tile Flooring
1	099000	Painting and Coating
2	099113	Exterior Painting

DIVISION 10 - SPECIALTIES

2	10160	Toilet Compartments DELETE
2	102113	Toilet Compartments
2	102800	Washroom Accessories

DIVISION 22 - PLUMBING

220509	General Requirements – Plumbing
220517	Sleeves & Seals for Plumbing Piping
220523	General Duty Valves for Plumbing Piping
220529	Hangers & Support for Plumbing Piping & Equipment

DIVISION 22 – PLUMBING (Continued)

220700	Plumbing Insulation
221116	Domestic Water Piping
221316	Sanitary Waste & Vent Piping
221319	Sanitary Waste Piping Specialties
224000	Plumbing Fixtures

DIVISION 23 - HVAC

230523	General Duty Valves for HVAC Piping
230529	Hangers & Supports for HVAC Piping & Equipment
230593	Testing, Adjusting & Balancing (Tab) for HVAC
230700	HVAC Insulation
230900	Instrumentation & Controls for HVAC
232113	Hydronic Piping
233113	Metal Ducts
233300	Air Duct Accessories
238126	Split-System Air-Conditioners & Heat Pumps
238216	Air Coils

DIVISION 26 - ELECTRICAL

260500	Common Work Results for Electrical
260501	Work in Existing Building

DIVISION 26 - ELECTRICAL

260519	Low-Voltage Electrical Power Conductors & Cables
260526	Grounding & Bonding for Electrical Systems
260529	Hangers & Supports for Electrical Systems
260553	Raceway & Boxes for Electrical Systems
260553	Identification for Electrical Systems
260923	Lighting Control Devices
262726	Wiring Devices
265113	Interior Lighting

PROJECT DRAWINGS:

- A. East & West Additions Drawings
- B. Exam Rooms Drawings
- C. Pharmacy Improvements Drawings
- D. Restroom Improvements Drawings
- E. Site Improvements Drawings
- F. Walk-In and Triage Exam Room Drawings

END OF SECTION

PROJECT No. 14-18-4745-01
Health Care Center #10 – Interior and Exterior Improvements
000110-4
TABLE OF CONTENTS



SECTION 020100

PROJECT SURVEY & LAYOUT

PART 1 GENERAL

1.01 SCOPE OF SERVICES

- A. The contractor shall provide construction stakeout sufficient to construct the proposed improvement in accordance with the approved construction plans.
- B. All stakeout services shall be completed under the direct supervision of a Professional Land Surveyor licensed in the State where the project is located.
- C. The Owner shall provide the following prior to the commencement of any stake-out services:
 - 1. Approved for construction site plans;
 - 2. Approved for construction dimensional control plans including a fixed relationship to the site boundary or on-site fixed element;
 - 3. Copies of the topographic survey that the approved site plans have been based on when available. The topographic survey shall include a minimum of two benchmarks, which shall be used for vertical control;
 - 4. Copies of the boundary survey that the approved site plans have been based on when available. The boundary survey shall be closed and monumented. These monuments shall be used for horizontal control, or a monumented baseline (minimum of 3 points) related to the site boundary and the dimensional control plan.

1.02 EXECUTION

- A. Work shall be performed by a Professional Land Surveyor, licensed in the State where the project is being completed, or under his direction:
- B. Playground Equipment Layout - Offset stakes will be located at post locations.
- C. Storm drainage and sanitary sewer lines (including manholes and catch basins). Stakes will be located @ 50 ft. stationing along the centerline of the utility line @ 15 ft. offsets. Manholes and catch basins will have 2 offsets per structure. Cut sheets shall be provided to the contractor by the surveyor.
- D. Water Layout - Offset stakes will be located at deflections and at hydrant locations. Hydrant elevations will be to grade ring.
- E. Lighting Layout - Centerline of lighting structure with 5 ft. offsets and finished grade elevations.

- F. Grade Stakes - Stakes will be located as needed to provide elevation references.
- G. Contractor will field verify the utility location, size and invert elevations at points of connection in area of conflict, prior to construction and protect them from damage.
- H. Notify engineer, if it is necessary to destroy or remove control points and/or benchmarks due to construction. Contractor shall be responsible for cost of relocation.
- I. Advise engineer of any discrepancies between plans and field layout.

1.03 REFERENCE STANDARDS

- A. In accordance with local rules and regulations.

1.04 QUALITY ASSURANCE

- A. All construction layout work shall be performed under the direction of a Professional Land Surveyor.
- B. The survey crew will discuss all layout procedures with the contractor's supervisor prior to commencing work.
- C. The survey crew daily report shall be filled out and signed by the contractor's supervisor at the end of that day's layout.
- D. Copies of sketches, cut sheets, etc. shall be provided to the contractor by the end of the next workday.
- E. All costs related to re-staking due to construction or contractors' work resulting in destruction or movement of stakes shall be paid for by the contractor and at no additional expense to the owner.

PART 2 PRODUCTS

2.01 MATERIALS

- A. The contractor/surveyor shall supply all stakeout materials.

2.02 EQUIPMENT

- A. The Contractor/Surveyor shall supply all equipment necessary to accomplish the work.

END OF SECTION



SECTION 020200

EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. This work consists of furnishing, placing and maintaining erosion and sediment control measures in accordance with these specifications
- B. The contractor shall adhere to standards specified in the Commonwealth of Pennsylvania, Department of Environmental Protection (PA-DEP), Office of Water Management, EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL, March 2000, for control of erosion, sediment and stream flow. Typical details from this manual are provided on the construction documents.

1.02 RELATED SECTIONS

- A. Division 2 Section 02300 – Earthwork
- B. Division 2 Section 02930 – Exterior Planting

1.03 REFERENCES

- A. Pennsylvania Department of Environmental Protection; Bureau of Water Management; Erosion and Sediment Pollution Control Program Manual.
- B. Pennsylvania Code, Title 25, Chapter 102

1.04 SUBMITTALS

- A. Filter bags, inlet filter bags, sediment control products. Submit product data to Department of Public Property, including complete list of erosion and sediment control products, and written plan for implementation of E&S controls upon receipt of notice to proceed and prior to construction.

1.05 MATERIALS

- A. All materials are specified on the Construction Drawings.

1.06 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary trades and who are completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.
- B. Codes and Standards: Perform work in compliance with applicable requirements of governing authorities having jurisdiction. Construction operations shall be carried out in a manner such that soil erosion, air pollution, and water pollution is minimized. State, County, and Municipal laws concerning pollution abatement shall be followed.
- C. The Contractor shall follow Soil Erosion and Sediment Control Notes that are shown on the construction drawings and which are dictated by the PADEP and/or the PWD.
- D. The recommendations and Standards set forth in Chapter 102 of the Pennsylvania Code (Erosion and Sediment Control Handbook), published by the PA Department of Environmental Protection, shall be applicable where the work is not specifically detailed in this Specification, the accompanying Drawings, or the Erosion and Sediment Control Plan.

- E. The Contractor shall take action to remedy unforeseen erosion conditions and to prevent damage to adjacent properties as a result of increased runoff and/or sediment displacement. Stockpiles of wood chips, hay bales, crushed stone, and other mulches shall be held in readiness to deal immediately with emergency problems of erosion. All erosion control checks and structures shall be inspected after heavy rainfalls, and if damaged, repaired or replaced.

PART 2 PRODUCTS

2.01 INLET PROTECTION FILTER BAG

- A. Filter bag shall be manufactured with woven polypropylene geotextile and sewn by a double needle machine, using a high strength nylon thread.
- B. Filter bag will be manufactured to fit the opening of the catch basin or drop inlet. Filter bag will have the following features:
 - 1. Two dump straps attached at the bottom to facilitate the emptying of the bag
 - 2. Lifting loops as an internal part of the system to be used to lift the filter bag from the basin
 - 3. Restraint cord approximately halfway up the sack to keep the sides away from the basin walls, this cord is also a visual means of indicating when the sack should be emptied.
- C. Filter bag seams shall have a certified average wide width strength per ASTM D-4884 standard.
- D. Inlet filter bags for installation in new or existing highway grate and open mouth grate inlets shall be Silt Sack as manufactured by AFC Environmental or approved equal.
- E. Open mouth inlet, city inlet, protection shall be a synthetic filter manufactured from recycled synthetic fibers such as Gutterbuddy distributed by ACF Environmental or approved equal

2.02 ROCK CONSTRUCTION ENTRANCE

- A. The Contractor shall install the rock construction entrance in accordance with the Erosion and Sediment Pollution Control Details in the Contract Plans or as directed by the Engineer.
- B. Rock construction entrance thickness shall be constantly maintained to the specified dimensions by adding rock. At the end of each construction day, all sediment deposited on paved roadways shall be removed and returned to the construction site.

2.03 TUBULAR SEDIMENT CONTROL DEVICE

- A. Sediment control to be placed on hardscape surfaces shall be a three-dimensional tubular sediment control. Tubular control shall be Filtrexx Siltsox manufactured by Filtrexx International LLC of Grafton Ohio or approved equal.

PART 3 EXECUTION

3.01 PREPARATION

- A. Review site conditions and sediment control plans.
- B. Review the soil erosion and sediment control plans as they apply to current conditions. Any proposed deviation from the plans must be submitted to the engineer in writing 72 hours prior to commencing that work.
- C. A preconstruction meeting shall be held at the site at least one (1) week prior to any earth disturbance. The meeting shall be scheduled and coordinated to include the contractor, the owner's representative, the PWD representative (PWD Inspections Coordinator, 215-685-6387) and the design engineer.

3.02 SOIL EROSION CONTROL AND SLOPE PROTECTION IMPLEMENTATION

- A. Place soil erosion control systems in accordance with the staging and features shown on the sediment control plans prior to any earthwork construction and immediately following the construction of any storm drainage devices.
- B. Limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and embankment operations by following construction phasing in the sediment control plans.
- C. The Contractor will be required to incorporate all permanent soil erosion control features into the project at the earliest practical time to minimize the need for temporary controls. Cut slopes shall be permanently seeded and mulched as the excavation proceeds to the extent considered desirable and practical. Equip catch basins with filter fabric inlet protection immediately upon construction.
- D. Slopes that erode easily shall be temporary seeded as the work progresses with quick-growing grass grains of wheat, rye or oats (See Section 02920 Lawn and Fine Grading) unless otherwise specified.

3.03 GENERAL REQUIREMENTS

- A. All temporary erosion and sediment control measures indicated specified herein shall be in place before the beginning of any earthwork. These include, but are not limited to, the following:
 - 1. Inlet Protection
 - 2. Rock Construction Entrances
 - 3. Tubular Sediment Control Device
- B. When temporary erosion and sediment control measures as described herein do not provide adequate control, replacement or relocation of measures may be required.
- C. Erosion and sediment control measures shall be inspected weekly and after every precipitation event.
- D. Contractor shall maintain complete written logs of inspections and shall make them available to the Project Manager upon request.
- E. All maintenance work, including cleaning, repair, replacement, regrading, and restabilization shall be performed immediately.
- F. Stockpiles of excavated or backfill material shall be protected with plastic sheets at the end of each working day.
- G. Upon completing construction, the contractor shall remove all temporary erosion and sediment control.
- H. Inlets that capture runoff from the construction site shall be swept clean to the satisfaction of the project manager.

3.04 PUMPED WATER FILTER BAG

- A. Sediment laden water shall be pumped through a pumped water filter bag as specified herein.
- B. Filter bags shall be removed and replaced when they have reached their capacity to filter sediment effectively.

3.05 SEDIMENT FILTER BAG FOR DEWATERING TRENCH

- A. Absolutely no discharge whatsoever may be made to a separate storm sewer.
- B. Discharges of groundwater and or/ accumulated storm water, or sanitary sewage to a combined sewer or sanitary sewer require sediment filter bags.

3.06 DISCHARGE OF GROUND WATER

- A. Ground water is water that collects or flows beneath the Earth's surface, filling the porous spaces in soil, sediment, and rocks. It is formed chiefly as a result of the seepage of atmospheric precipitation and water from rivers, lakes, reservoirs, and irrigation ditches.
- B. The contractor's options for disposing of groundwater are to containerize it and haul it off site, or obtain approval from the Industrial Waste Unit to discharge to an approved sanitary or combined sewer location. Contact Information:

Jennifer L. Moore, Environmental Engineer
Philadelphia Water Dept., Industrial Waste Unit
1101 Market Street, 3rd. Floor
Philadelphia PA, 19107
Telephone number: 215-685-6085 or 215-685-6236

3.07 INLET PROTECTION

- A. All storm water inlets immediately downstream of disturbance areas on the project site shall be protected with approved inlet protection practices.
- B. All new inlets shall be protected with approved inlet protection practices upon installation.
- C. Highway grate and open mouth grate inlets shall be protected using inlet filter bags
- D. Open mouth grate inlets and open mouth inlets (city inlets) shall be protected with an inlet filter bag compost sock or synthetic filter specified herein.
- E. Inlet protection shall be installed, inspected, cleaned and replaced according to manufacturer's specifications.
 - 1. Inlet filter bags and open mouth inlet protection shall be removed and replaced when filled with silt or when extended periods of ponding occur following a precipitation event. New inlet filter bags or approved inlet protection devices shall be installed and secured immediately after removal of silted protection devices.

3.08 ROCK CONSTRUCTION ENTRANCE

- A. The contractor shall inspect all rock construction entrances daily and after each runoff event.
- B. Rock construction entrance thickness shall be constantly maintained to the specified dimensions. Should routing or significant wear occur along any of the access roadways, the contractor shall be responsible for the re-grading and possibly adding supplemental materials, as require to return to grade and function.
- C. At the end of each construction day, all sediment deposited on the paved roadways and construction entrances shall be removed and returned to the construction site.

3.09 REMOVAL AND FINAL CLEANUP

- A. Once the site has been fully stabilized, temporary erosion and sedimentation control measures and all accumulated silt and sediment shall be removed. All permanent inlet protection measures shall be cleaned, inspected, and verified to be in working order.
- B. Silt and waste materials shall be disposed of in a proper manner.

END OF SECTION



SECTION 022000
SITE PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Extent of work is shown on Drawings and includes but is not limited to:
 - 1. Protection.
 - 3. Weed control.
 - 4. Tree removal.
 - 5. Tree transplant.
 - 6. Salvage.
 - 7. Demolition, removal and disposal.
 - 8. Stripping and stockpiling of topsoil.
 - 9. Clean up.
- B. Related Sections:
 - 1. Division 2 Section "Tree Protection and Trimming" for tree protection and pruning.

1.3 REFERENCES

- A. The following apply to work in this Section:
 - 1. City of Philadelphia Department of Licenses and Inspections Manual of Technical Procedures: Manual published by the City of Philadelphia, Construction Section, latest edition.

1.4 DEFINITIONS

- A. The following apply to work in this Section:
 - 1. Certified Arborist: Certified by successfully passing the CAPD (Certified Arborists of Pennsylvania and Delaware) examination.
 - 2. Registered Plumber and Electrician: Registered to conduct business in the City of Philadelphia.

1.5 SUBMITTALS

- A. Submit under provisions of SECTION 01300 prior to delivery of materials to site.
- B. Certifications: Submit permit from owner.
 - 1. Landfill or dump.
- C. Tree Transplant
 - 1. Pruning Schedule: Written schedule prepared by arborist detailing scope and extent of pruning each tree in preparation for and subsequent to transplanting.

- a. Species and size of plant.
 - b. Location on site plan. Include unique identifier for each.
 - c. Reason for pruning.
 - d. Seasonal limitations on pruning.
 - e. Preparatory Pruning: Time schedule and description of preparatory pruning to be performed.
 - f. Indicate time in months preceding the extraction of the tree.
 - g. Indicate diameter of root ball and depth of root pruning for each tree.
 - h. Description of root and crown pruning during and subsequent to transplanting.
 - i. Description of maintenance following pruning.
2. Qualification Data: For qualified tree-service firm and arborist.
 3. Existing Conditions: Documentation of existing trees indicated to be transplanted, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.
 - a. Use sufficiently detailed color photographs or video recordings. Color shall accurately depict hue condition of foliage and bark.
 - b. Include drawings and notations to indicate specific wounds and damage conditions of each tree designated to be transplanted.
 4. Tree-Transplanting Program: Submit before work begins.

1.6 QUALITY ASSURANCE

- A. Contractor shall have had experience with at least two (2) other projects of similar scope and complexity and shall perform work with personnel totally familiar with tree pruning and removal, site preparation and construction techniques under the supervision of an experienced foreperson.
- B. Preconstruction meeting: Contractor shall arrange a preconstruction meeting between Owner, Landscape Architect and contractor to review the proposed schedule, limits of clearing and soil disturbance, stockpile location, location of protection fencing and coordination for construction. Any conflicts between construction and tree protection shall be brought to the attention of the Owner and Landscape Architect at this time.
- C. Tree-Service Firm Qualifications: An experienced landscaping contractor or tree-moving firm that has successfully completed transplanting work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.

Arborist Qualifications: Certified Arborist as certified by successfully passing the CAPD (Certified Arborists of Pennsylvania and Delaware) examination.

- D. Tree-Transplanting Program: Prepare a written plan by arborist for transplanting trees for the whole Project, including each phase or process, tree maintenance, and protection of surrounding materials during operations.

Describe in detail the materials, methods, and equipment to be used for each phase of the transplanting work.

1. Include transplanting times appropriate for each species at the Project location unless otherwise indicated on Drawings.
2. Include a transplanting schedule for each species to be transplanted, coordinated with the Project schedule.
3. Include site plans clearly marked to show tree-moving routes from extraction to planting locations. Indicate proposed equipment, weight, and turning radii.
4. Show details of temporary protective barriers where needed.
5. Include care and maintenance provisions.

1.7 REGULATORY REQUIREMENTS

- A. Comply with all rules, regulations, laws and ordinances of local, state and federal authorities having jurisdiction. Provide labor, materials, equipment and services necessary to make work comply with such requirements without additional cost to Owner.
 1. Coordinate work with utility companies. Notify Pennsylvania One Call System, Inc. 1-800-242-1776 not less than three working days prior to beginning work.
- B. Investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions and other limitations affecting transportation to and ingress and egress at the site.
 1. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction.
- C. Conform to applicable code for disposal of debris.
- D. Procure and pay for permits and licenses required for work.

1.8 DELIVERY STORAGE AND HANDLING

- A. Deliver, store, handle and protect all materials from damage.
- B. Tree Transplant
 1. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees in such a manner as to destroy their natural shape.
 2. Completely cover foliage when transporting trees while they are in foliage.
 3. Handle trees by root ball. Do not drop trees.

4. Move trees after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after moving, set trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1.9 PROJECT CONDITIONS

A. Existing conditions:

1. Verify all existing conditions in the field.
 - a. Plans are not based on current surveys or as-built drawings and location of existing site elements is approximate.
 - b. Should any work performed under this Section expose previously unknown conditions, immediately report the discovery to Owner. However, during this time use any measures necessary to maintain adequate safety conditions.
 - 1) Should Contractor, in the course of work, find any discrepancies between Drawings and physical conditions, inform Owner immediately in writing for clarification. Work done after such discovery, unless authorized by Owner, shall be at Contractor's risk.

B. Protection of existing conditions adjacent to and within construction zone:

1. All necessary precautions for safety including barricades and other protection measures shall be taken during all work.
2. All heavy equipment shall be driven or parked on the site only where approved by Owner.
3. Existing pavements, lawns, structures, walls, etc. damaged or disturbed during construction shall be repaired or replaced to the satisfaction of the Owner at no additional cost.
4. Repair and replace all active utility lines, above and below grade, damaged in the course of construction operations at no additional cost to Owner.
5. Avoid damaging existing trees. Refer to Section "Tree Protection and Trimming".

C. Salvageable items:

1. Carefully remove items indicated on Drawings as salvageable, and store as directed by Owner.

D. Tree Transplant

1. Field Measurements: Verify final grade elevations and final locations of trees and construction contiguous with trees by field measurements before proceeding with transplanting work. Perform transplanting only after finish grades are established.
2. Seasonal Restrictions: Transplant trees during the following in-season periods:

- a. Spring: May commence as soon as weather and soil conditions permitted as specified herein. Approximately April 1 to June 15.
- b. Fall: Shall be completed at least four (4) weeks prior to when first frost is predicted to allow for proper establishment. Approximately September 15 and November 15.

1.10 SEQUENCING AND SCHEDULING

- A. Coordinate work of this Section with work of all other Sections of Specification.

1.11 TREE TRANSPLANT WARRANTY AND MAINTENANCE

- A. Refer to Division 2 “Exterior Planting”.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Substitutions: Under provisions of SECTION 01600.

2.2 PLANTING MATERIALS

- A. Refer to Division 2 “Exterior Planting”.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Prior to beginning work ascertain the location of all above and below grade utility lines. Take proper precautions so as not to disturb or damage sub-surface elements.
- B. Beginning of work means acceptance of existing conditions.

3.2 PREPARATION

- A. No salvage, pruning, demolition, removal or disposal shall take place prior to the installation of protection measures.
- B. Protect all existing to remain, utilities, structures, pavements, trees, lawn and other site elements from damage or displacement.
- C. Contractor shall make every effort to prevent dust and dirt from construction activities from flying around and coating existing structures.

3.3 SALVAGE

- A. All salvaged items are shown on the Drawings.

DEMOLITION, REMOVAL AND DISPOSAL

- A. Removals are shown on the Drawings.
1. Demolition shall be accomplished in accordance with all the requirements of the "City of Philadelphia Department of Licenses and Inspections Manual of Technical Procedures".
 2. Remove, by Certified Arborist, all trees indicated on the Drawings.
 - a. When removing trees if damage to adjacent plant material, structures, pavement, etc., is possible, remove trees in sections from the top. Rope and lower top limbs and branches in a manner commensurate with safe practices under hazardous conditions.
 - b. Remove stumps to a depth of 12 inches below present grade using a stump remover.
 - c. Fill holes with clean fill approved by Owner. Tamp and seed with approved seed mixture. See SECTION.
 3. Remove all , site furnishings, associated footings designated on Drawings.
 - a. Remove all abandoned footings within Contract Limit Line or project area. The location of these footings may not appear on Drawings.
 - 1) Demolish footings and curbs to six (6) inches below grade, and install approved fill or base and surface materials as indicated on Drawings.
 4. Strip lawn, debris and other deleterious materials from areas to be improved.
 5. Remove pavements or other surfaces with extreme care, using hand removal methods only within drip lines of existing trees. Do not use heavy machinery that will damage roots or trees in any way. If there is any possibility of damage to existing plants or other site features, call :Landscape Architect and Owner to review site conditions.
 6. Saw cut, to separate, like pavements where pavement to be removed abuts pavement to remain.
 - a. Edges and corners of adjacent pavement shall be clean, true and at right angles with no chips.
 - b. No over cutting caused by circular saw blades shall be visible on the finish surface of the existing pavement to remain.
 7. Mill or cut paved areas around existing, to remain, inlets, manholes and catch basins, etc. to the new profile, leaving only the frames projecting.
 8. Abandoned utility lines, that may be encountered during the course of work, shall be cut off and capped by a registered plumber or electrician under the direction of the General Contractor.
 9. Materials designated for removal from the site and premises shall be disposed of at a landfill or other designated location that complies with current Federal, State and Local statutes.

- a. Contractor shall supply two (2) copies of the permit from the owner of the property where debris will be deposited.

3.5 TOPSOIL STRIPPING AND STOCKPILING

- A. Prior to starting general excavation, remove topsoil within the limits of work. Topsoil shall be stripped to its entire natural depth. Satisfactory topsoil is reasonably free of subsoil. Where existing trees are to remain, leave existing topsoil in place within drip-line to prevent damage to root system.
- B. Do no stripping without clear understanding of existing soil, planting, and site conditions to be preserved.
- C. Topsoil stripped from site may be used in planting soil mix provided that it meets the requirements of section 02910.
- D. Stockpile area for topsoil shall be approved by Landscape Architect and Owner. Should the topsoil be stockpiled in any area without proper approval of the Landscape Architect, the Contractor may be directed to relocate the stockpile to another portion of the site.
- E. Shape stockpile to drain. Piles shall be covered with a tarpaulin until time of actual use to prevent germination of weed seeds.

3.5 TREE TRANSPLANT

- A. Refer to Division 2 “Exterior Planting” for Examination, Preparation, Planting Area Establishment, Excavation for Trees, and Tree Planting and Mulching.
- B. Refer to Division 2 “Tree Protection and Trimming” for Root Pruning and Crown Pruning in advance of extracting each tree as the Project Schedule allows.
- C. Excavation and Planting Equipment - Tree Spade: Track-mounted mechanized tree mover; sized according to manufacturer's size recommendation for each tree being transplanted.
- D. Extracting Trees
 - 1. General: Extract trees under supervision of the arborist.
 - 2. Orientation Marking: Mark the north side of each tree with non-permanent paint before extracting.
 - 3. Root-Ball Width and Depth: As determined by the arborist for each species and size of tree and for site conditions at original and planting locations.
 - 4. Digging:
 - a. Dig and clear a pit with tree spade to the depth of the root system. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
 - b. Use narrow-tine spading forks to comb soil to expose roots with minimal damage to root system.
 - c. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking.

- d. Cut exposed roots manually with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not paint or apply sealants on cut root ends.
 - e. Temporarily support and protect exposed roots from damage until they are permanently redirected and covered with soil. Cover roots with burlap and keep them moist until planted.
5. Extracting with Tree Spade: Use the same tree spade to extract the tree as will be used to transport and plant the tree.
- a. Do not use tree spade to move trees larger than the manufacturer's maximum size recommendation for the tree spade being used.
 - b. When extracting the tree, center the trunk within the tree spade and move tree with a solid ball of earth.

3.6 CLEAN UP

- A. Maintain the site in an orderly condition during the progress of work. Promptly remove debris and trash. Leave the site in a neat, orderly condition, broom clean.

END OF SECTION



SECTION 022210
STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Salvage of existing items to be reused or recycled.
- B. Related Requirements:
 - 1. Division 2 Section "Site Clearing".
 - 2. Division 2 Section "Tree Protection and Trimming".

1.3 DEFINITIONS

- A. Demolish: Remove existing construction and legally dispose of off-site.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 PRECONSTRUCTION MEETINGS

- A. Pre-demolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be demolished.
 - 2. Review and finalize demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review requirements of work performed by other trades that rely on substrates exposed by demolition operations.
 - 4. Review areas where existing construction is to remain and requires protection.

1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.7 FIELD CONDITIONS

- A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 1. Before demolition, Owner will remove all items in structure. Do not proceed with demolition until receipt of written confirmation that all items to be maintained have been removed from structure.
- B. Notify Landscape Architect of discrepancies between existing conditions and Drawings before proceeding with demolition.

- C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Landscape Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting demolition operations.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Landscape Architect.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. Disconnect, demolish, and remove electrical, plumbing, equipment, and components indicated to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent facilities.
 - 1. Provide protection to ensure safe passage of people around demolition area.

3.4 DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 2. Remove structure by method suitable to prevent dust generation.
 - 3. Dispose of demolished items and materials promptly.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION



SECTION 022300

SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Protecting existing vegetation to remain.
 - 2. Removing existing vegetation.
 - 3. Clearing and grubbing.
 - 4. Removing above- and below-grade site improvements.
 - 5. Disconnecting, capping or sealing, and abandoning site utilities in place.
 - 6. Temporary erosion- and sedimentation-control measures.
- B. Related Sections:
 - 1. Division 2 Section "Structure Demolition".
 - 2. Division 2 Section "Tree Protection and Trimming".

1.3 DEFINITIONS

- A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- B. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
- C. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.
- D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Project site.

1.7 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing 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. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises as coordinated with Owner. Deliver salvaged items to Owner's facility.
- C. Utility Locator Service: Notify PA One Call for area where Project is located before site clearing.
- D. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures 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 unless approved otherwise by Owner's Representative.
 - 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 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Division 2 Section "Earthwork."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

- A. General: Protect trees and plants remaining on-site according to requirements in Division 2 Section "Tree Protection and Trimming."
- B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Owner.

3.4 EXISTING UTILITIES

- A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
 - 1. Arrange with utility companies to shut off indicated utilities.
- B. Locate, identify, and disconnect utilities indicated to be abandoned in place.

- C. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than five (5) working days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Owner's written permission.
- D. Excavate for and remove underground utilities indicated to be removed.

3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches below exposed subgrade.
 - 3. Use only hand methods for grubbing within protection zones.
 - 4. Chip removed tree branches and dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.6 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
 - 2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.7 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION



SECTION 022310
TREE PROTECTION AND TRIMMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.
- B. Related Sections:
 - 1. Division 2 Section "Site Clearing" for removing existing trees and shrubs.

1.3 DEFINITIONS

- A. Caliper: Diameter of a trunk measured by a diameter tape at 6 inches above the ground for trees up to, and including, 6-inch size; and breast height (DBH) for trees larger than 6-inch size.
- B. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.
- C. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples and Product Data for Verification: For each type of the following:
 - 1. Organic Mulch: One (1) gallon of organic mulch; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.
 - 2. Protection-Zone Fencing: Product data.
 - 3. Protection-Zone Signage: Product data.
- C. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain.
 - 1. Species and size of tree.
 - 2. Location on site plan. Include unique identifier for each.
 - 3. Reason for pruning.
 - 4. Description of pruning to be performed.
 - 5. Description of maintenance following pruning.
- D. Qualification Data: For qualified arborist and tree service firm.
- E. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
- F. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.
- G. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.
 - 1. Use sufficiently detailed photographs.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

1.5 QUALITY ASSURANCE

- A. Arborist Qualifications: Certified Arborist as certified by ISA.
- B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.
- C. Pre-installation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:
 - a. Construction schedule. Verify availability of materials, personnel, and equipment needed to make progress and avoid delays.
 - b. Enforcing requirements for protection zones.
 - c. Arborist's responsibilities.
 - d. Field quality control.

1.6 PROJECT CONDITIONS

- A. 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 unless approved otherwise by Owner's Representative.
 - 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.
- B. Do not direct vehicle or equipment exhaust toward protection zones.
- C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Topsoil: As defined in 02910 Planting Soil.
- B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:
 - 1. Type: Shredded hardwood.
 - 2. Size Range: 3 inches maximum, 1/2 inch minimum.
 - 3. Color: Natural. Dyed mulch is prohibited.
- C. Protection-Zone Fencing: Fencing fixed in position and meeting one of the following requirements. Previously used materials may be used when approved by Owner.
 - 1. Chain-Link Protection-Zone Fencing: Galvanized-steel fencing with 2" min. mesh size.
 - a. Height: 6 feet.
 - 2. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch; secured with plastic bands or galvanized-steel or stainless-steel wire ties; and supported by tubular or T-shape galvanized-steel posts spaced not more than 8 feet apart.

- a. Height: 4 feet.
 - b. Color: High-visibility orange, non-fading.
- D. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes pre-punched and reinforced; legibly printed with non-fading lettering and as follows:
- 1. Size and Text: TREE PROTECTION AREA – DO NOT ENTER – ZONA DE PROTECCION – PARA ARBOLES – NO ENTRE
 - 2. Lettering: 3-inch high minimum, red characters on white background.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- B. For the record, prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.

3.2 PREPARATION

- A. Locate and clearly identify trees, shrubs, and other vegetation to remain. Flag each tree to remain on the trunk at 72 inches above the ground with distinctive, highly visible color. Supervising contractor or foreman is responsible to instruct all laborers and workers of the tree protection requirements.
- B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

3.3 TREE- AND PLANT-PROTECTION ZONES

- A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people and pets from easily entering protected area except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.
 - 1. Chain-Link Fencing: Install to comply with ASTM F 567 and with manufacturer's written instructions.
 - 2. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Do not drive posts through large tree roots. Where a post is located on existing paving or concrete to remain, provide weighted base or appropriate means of post support acceptable to Owner.
 - 3. Access Gates: Install as required; adjust to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Owner. Install one sign spaced approximately every 50 feet on protection-zone fencing.
- C. Maintain protection zones free trash.
- D. Repair or replace trees, shrubs, and other vegetation indicated to remain that are damaged by construction operations, in a manner approved by Owner.

- E. Maintain protection-zone fencing and signage in good condition as acceptable to Owner and remove when construction operations are complete and equipment has been removed from the site.
 - 1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
 - 2. Temporary access is permitted subject to preapproval in writing by Owner if a root buffer effective against soil compaction is constructed as directed by Owner. Maintain root buffer so long as access is permitted.

3.4 EXCAVATION

- A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Division 2 Section "Earthwork."
- B. Trenching near Trees: Where utility trenches are required within protection zones, hand excavate under or around tree roots or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning.
- C. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.5 ROOT PRUNING

- A. Prune roots that are affected by temporary and permanent construction. Prune roots as follows:
 - 1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
 - 2. Cut Ends: Do not paint cut root ends.
 - 3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
 - 4. Cover exposed roots with burlap and water regularly.
 - 5. Backfill as soon as possible according to requirements in Division 2 Section "Earthwork" and/or "Planting Soil".
- B. Root Pruning within Protection Zone: Clear and excavate by hand to the depth of the required excavation to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

3.6 CROWN PRUNING

- A. Prune branches that are affected by temporary and permanent construction. Prune branches as follows:
 - 1. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by arborist.
 - 2. Pruning Standards: Prune trees according to ANSI A300 (Part 1) and the following:
 - a. Type of Pruning: Cleaning, Thinning, and/or Reduction.
 - b. Specialty Pruning: Restoration.
 - 3. Cut branches with sharp pruning instruments; do not break or chop.
 - 4. Do not apply pruning paint to wounds.
- B. Chip removed branches and dispose of off-site.

3.7 REGRADING

- A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.
- B. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.
- C. Minor Fill within Protection Zone: Where existing grade is 2 inches or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.

3.8 FIELD QUALITY CONTROL

- A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.9 REPAIR AND REPLACEMENT

- A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain that are damaged by construction operations, in a manner approved by Owner.
 - 1. Submit details of proposed root cutting and tree and shrub repairs.
 - 2. Have arborist perform the root cutting, branch pruning, and damage repair of trees and shrubs.
 - 3. Treat damaged trunks, limbs, and roots according to arborist's written instructions.
 - 4. Perform repairs within 24 hours.
 - 5. Replace vegetation that cannot be repaired and restored to full-growth status, as determined by Owner.
- B. Trees: Resultant of construction operations damage, remove and replace trees indicated to remain that are more than 25 percent dead or in an unhealthy condition that Owner determines are incapable of restoring to normal growth pattern.
 - 1. Provide new trees of same size and species as those being replaced for each tree that measures 6 inches or smaller in caliper size.
 - 2. Provide one new tree of 8-inch caliper size for each tree being replaced that measures more than 6 inches in caliper size.
 - a. Species: Species selected by Owner.
 - 3. Plant and maintain new trees as specified in Division 2 Section "Exterior Plants."
- C. Soil Aeration: Where directed by Owner, aerate surface soil compacted during construction. Aerate to extent as directed by Owner beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with approved Compost.

3.10 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove excess excavated material, displaced trees, trash and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 023100



EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Excavating
2. Underpinning
3. Backfilling and compacting
4. Preparing sub-grades for pavements.
5. Sub-base and base course for asphalt paving.
6. Excavating and backfilling for utility trenches.

1.2 DEFINITIONS

A. Backfill: Soil 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: Course placed between the sub-base course and hot-mix asphalt paving.

C. Bedding Course: Course placed over the excavated sub-grade in a trench before laying pipe.

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

E. Excavation: Removal of material encountered above sub-grade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below sub-grade elevations or beyond indicated lines and dimensions as directed by Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions changes in the Work.
2. Unauthorized Excavation: Excavation below sub-grade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

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

- G. Sub-base Course: Course placed between the sub-grade and base course for hot-mix asphalt pavement, or course placed between the sub-grade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- H. Sub-grade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below sub-base.

1.3 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Owner or Owner's representative and then only after arranging to provide temporary utility services according to requirements indicated.

1.4 SUBMITTALS

- A. Dewatering Plan: Describe equipment, materials, installation and operation required to lower ground water table; include calculations to support plan.
- B. Testing Agency Qualifications, to include licensed geotechnical engineer on site.
- C. Inspection Reports to be submitted to Engineer of Record within 72 hours of testing.

1.5 SAMPLES

- A. Determine optimum moisture density relationship in accordance with ASTM D1557.

1.6 QUALITY ASSURANCE

- A. Prepare dewatering plan by professional engineer licensed in the Commonwealth of Pennsylvania.

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: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM AASHTO M 145 Soil Classification Groups A-1, A-2-4, A-2-5, and A-3, 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 D 2487 A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145, 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 D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

2.2 **FILL MATERIALS**

- A. Type A - Select Granular Material: Pennsylvania DOT 2A coarse stone aggregate with the following gradation:

Sieve Size	Percent Passing
2 inch	100
3/4 inch	52-100
3/8 inch	36-70
Number 4	24-50
Number 8	16-38
Number 16	10-30
Number 200	0-10

- B. Type D - Subsoil: Reused, free of rock larger than 3 inch size, and debris, conforming to ASTM D2487 Group Symbol CL or OL

1.4 **ACCESSORIES**

- A. Non-Woven Geotextile Fabric
- B. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility.

PART 3 – EXECUTION

3.1 **PREPARATION**

- A. Identify required lines, levels, contours, and datum.
- B. Notify Design Professional of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

- C. Verify foundation or basement walls are braced to support surcharge forces imposed by backfilling operations
- D. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

3.2 DEWATERING

- A. Develop dewatering plan based on site surface and subsurface conditions and available soils and hydrological data.
- B. Lower ground water levels within excavation areas 12 inches, minimum below bottom of excavations. Relieve hydrostatic pressure in pervious zones below subgrade elevation in layered soils to prevent uplift.
- C. Place dewatering system in operation before excavating below ground water level. Operate system continuously, 24 hours per day, 7 days per week, until construction work below existing ground water levels is complete.

3.3 SUBSOIL EXCAVATING

- A. Excavate subsoil required for building foundations, construction operations, and other Work.
 - 1. Request inspection of subgrade surfaces by geotechnical engineer.
 - 2. Proof roll exposed subgrades in presence of geotechnical engineer.
 - 3. Backfill excavations to indicated elevations with removed fill when approved by geotechnical engineer as acceptable fill.
- B. Excavation shall not interfere with 45 degree bearing splay of any foundation.
- C. Correct unauthorized excavation at no extra cost to Owner.
- D. Fill over-excavated areas under structure bearing surfaces in accordance with direction by Geotechnical Engineer.
- E. Stockpile subsoil in area designated on site. When backfilling is complete, remove excess subsoil not being reused from site.

3.4 EXCAVATION

- A. Unclassified Excavation: Excavate to sub-grade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.5 EXCAVATION FOR PAVEMENTS

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

3.6 EXCAVATION FOR UTILITY TRENCHES

- A. Revise this Article to suit Project. Coordinate with utility Sections in other Divisions.
- B. Excavate trenches to indicated gradients, lines, depths, and elevations.
- C. 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: 12 inches each side of pipe or as indicated.
- D. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes. Shape sub-grade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench sub-grade.

3.7 SUBGRADE INSPECTION

- A. Proof-roll sub-grade below the pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated sub-grades.
- B. Reconstruct sub-grades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.8 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 Engineer.
 1. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.

3.9 STORAGE OF SOIL MATERIALS

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

3.10 UNDERPINNING

- A. Refer to Architectural and Structural Drawings for underpinning details.

3.11 PROOF ROLLING SUBGRADE SURFACES

- A. After excavating to required elevations, test subgrade for degree of compaction for existing soils.
- B. Proof roll subgrade in presence of soils engineer, by means approved by soils engineer, to minimum 95 percent of Modified Maximum Density in accordance with ASTM D1557.
- C. Adjust frequency and number of passes as directed by soils engineer.
- D. Provide additional proof rolling as directed by soils engineer to attain specified compaction.

3.12 BACKFILLING

- A. Backfill areas to contours and elevations. Use unfrozen and unsaturated materials.
- B. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- C. Place and compact fill materials in continuous layers not exceeding 10 inches loose depth.
 - 1. Compact each layer to 95 percent maximum density.
- D. Employ a placement method so not to disturb or damage foundations, foundation perimeter drainage, foundation waterproofing and protective cover, or utilities in trenches.
- E. Maintain optimum moisture content of backfill materials to attain required compaction density.
- F. Backfill against supported foundation walls. Backfill simultaneously on each side of unsupported foundation walls.

3.13 UTILITY TRENCH BACKFILL

- A. Place backfill on sub-grades 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. Provide 4-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 in a minimum of 4 inches of concrete before backfilling or placing roadway sub-base.
- D. Place and compact initial backfill of sub-base material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the utility pipe or conduit.
 - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- E. Place and compact final backfill of satisfactory soil to final sub-grade elevation.
- F. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below sub-grade under pavements and slabs.

3.14 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontals so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under pavements, use satisfactory soil material.

3.15 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate sub-grade 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 achieve a minimum of 98% dry unit weight according to ASTM D 698.

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.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish sub-grades to required elevations within the following tolerances:
 - 1. Pavements: Plus or minus 1/2 inch.

3.18 SUBBASE AND BASE COURSES

- A. Place sub-base and base course on sub-grades free of mud, frost, snow, or ice.
- B. On prepared sub-grade, place sub-base and base course under pavements as follows:
 - 1. Shape sub-base and base course to required crown elevations and cross-slope grades.
 - 2. Compact sub-base and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 98 percent of maximum dry unit weight according to ASTM D 698.

3.19 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage an Owner approved independent geotechnical engineering testing agency to perform field quality-control verification, inspection, and testing, including:
 - 1. Periodic verification that materials below footings are adequate to achieve the design bearing capacity.
 - 2. Periodic verification that excavations are extended to proper depths and have reached proper material.
 - 3. Periodically perform classification and testing of controlled fill materials.
 - 4. Continuously verify use of proper materials, densities, and lift thicknesses during placement and compaction of controlled fill.
 - 5. Prior to placement of controlled fill, periodically observe subgrade and verify that site has been prepared properly

- B. Allow testing agency to inspect and test sub-grades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Testing agency will test compaction of soils in place as applicable.
- D. Perform laboratory material tests in accordance with ASTM D1557 to determine maximum density and optimum moisture content.
- E. Perform in place compaction tests in accordance with the following:
 - 1. Density Tests: ASTM D1557.
 - 2. Moisture Tests: ASTM D3017.
- F. Frequency of Tests: As directed by geotechnical engineer
- G. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no additional cost to Owner.
- H. When testing agency reports that sub-grades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.

3.20 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 specify tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
- 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.

3.21 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION



SECTION 024113

SELECTIVE SITE CLEARING AND DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Demolition of sidewalks, pavement and aggregate bases.
 - 2. Saw-cutting pavement
 - 3. Disposal and/or recycling of demolished materials.
- B. This section does not include demolition of buildings or other above-grade structures.

1.3 REFERENCES

- A. The most current version of the publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
- B. City of Philadelphia Building Code
- C. Philadelphia Water Department: Standard Details and Specifications for Sewers
- D. AMERICAN NATIONAL STANDARDS INSTITUTE
 - 1. ANSI A10.6: Safety Requirements for Demolition Operations
- E. NATIONAL FIRE PROTECTION ASSOCIATION
 - 1. NFPA 241: Standard for Safeguarding Construction, Alteration, and Demolition Operations
- F. The Contractor is required to have one copy of the latest edition of each of the following publications available for review in the job-site construction office at all times while performing the work described in this Section. The Contractor is to comply with each of the following unless more stringent requirements are indicated on the Drawings or within these specifications.
 - 1. City of Philadelphia, Department of Streets: Standard Construction Items, except that measurement and payment sections do not apply

1.4 SUBMITTALS

- A. Pre-demolition Photographs (digital in JPG format, taken with a 4 mega-pixel digital camera with optical zoom or Videotape/DVD): Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Submit before Work begins.
- B. Schedule of Demolition Activities: Indicate the following:
 - 1. Detailed sequence of demolition and removal work, with starting and ending dates for each activity.
- C. Evidence of disposal and recycling contracts (for information only)

QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with governing local, State, and Federal notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI A10.6.

DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or recycled.
- B. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or recycled.

MATERIALS OWNERSHIP

- A. Unless otherwise noted, all cleared or demolished materials shall become Contractor's property and shall be promptly removed from the site.

PROJECT CONDITIONS

- A. Work on the site under other contracts may be concurrent with this contract. The Contractor shall coordinate the demolition sequence with all other contractors. The Contractor shall provide all temporary bracing, shoring, and supports that may be required to ensure the safety of personnel in areas of the site adjacent to the demolition area.
- B. Owner assumes no responsibility for site features to be demolished.
- C. Conditions existing at time of inspection for bidding purposes will be maintained by Owner as far as practicable.

- D. Storage or sale of removed items or materials on-site is not permitted.

COORDINATION

- A. Arrange demolition schedule so as not to interfere with other contractor's on-site operations.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

EXAMINATION

- A. Survey existing conditions and correlate with requirements indicated to determine extent of site demolition required.
- B. Review Project Record Documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are the same as those indicated in Project Record Documents.
- C. When unanticipated elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to the Owner.

PREPARATION

- A. Notify the Pennsylvania One-Call System at 1-800-242-1776 in accordance with Pennsylvania Act 287 and all amendments. Retain the services of a utility locator for identification of underground utilities on private property.
- B. Pre-demolition Conference: Conduct conference at Project site with Owner to discuss the following:
 - 1. Inspect and discuss condition of construction to be demolished.
 - 2. Review and finalize demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Erosion and Sediment Control Measures and inspections with the inspecting agency.
- C. Review and finalize protection requirements.
- D. Arrange to discontinue utility service with utility companies and other agencies:
- E. Obtain all required permits and post all required notifications prior to beginning the work.

- F. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
- G. Strengthen or add new supports when required during progress of demolition.

SAW CUTTING

- A. Saw-cut pavement at limits of removal where remaining pavement is to be incorporated into new work. Saw cuts shall be neat, straight, and a minimum of 1” in depth. Full depth saw cuts will be required where cutting utility trenches in the street.

PROTECTION

- A. Existing Facilities: Protect adjacent walkways, building entries, and other building facilities during demolition operations.
- B. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction or as indicated.
- C. Protect existing site appurtenances and landscaping which are to remain.
- D. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities which are to remain.
- E. Provide protection to ensure safe passage of people and vehicles around demolition areas, and to and from occupied portions of adjacent buildings and structures.

GENERAL DEMOLITION

- A. General: Demolish indicated site improvements completely. Use methods required to complete the Work within limitations of governing regulations
- B. Engineering Surveys: Perform regular engineering surveys of the entire work area as the Work progresses to detect hazards that may result from demolition activities. Maintain a written log of survey times, dates, and findings.
- C. Site Access and Temporary Controls: Conduct demolition and debris-removal operations to ensure minimum interference with roads, streets, sidewalks, walkways, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
 - 2. Use water mist, dust control palliatives, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, contaminated runoff, and pollution.

EXPLOSIVE DEMOLITION

- A. Explosives: Use of explosives is not permitted.

RESTORATION

- A. Below-Grade Areas: Fill below-grade areas and voids resulting from utility demolition operations with satisfactory soil materials. Refer to section 312000 Earthmoving for soil materials and compaction.

REPAIRS

- A. General: Promptly repair damage to adjacent construction.
- B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- C. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

RECYCLING DEMOLISHED MATERIALS

- A. General: Separate recyclable demolished materials from other demolished materials to the maximum extent possible. Separate recyclable materials by type.
 - 1. Provide containers or other storage method approved by the Owner for controlling recyclable materials until such materials are removed from Project site.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from demolition area.
 - 4. Store components off the ground and protect from the weather.
 - 5. Transport recyclable materials off Owner's property to the recycling process facility.
- B. Recycling Incentives: Revenues for recycling demolition materials shall accrue to the contractor unless otherwise noted in the Project Documents.

DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials planned to be recycled, reused, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in a permitted, regulated disposal facility.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

- B. Burning or burial: Do not burn or bury demolished materials unless otherwise specified.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

CLEANING

- A. Clean adjacent structures, streets, sidewalks, and other pavement surfaces to remain free of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before demolition operations began.

END OF SECTION



SECTION 024116

SELECTIVE BUILDING DEMOLITION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Demolition and removal of selected portions of structure.
 - 2. Demolition and removal of selected site elements.
- B. Related Sections include the following:
 - 1. Division 1 Section "Summary of Work" for use of premises and Owner-occupancy requirements.
 - 2. Division 1 Section "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for selective demolition operations.
 - 3. Division 1 Section "Cutting, Patching Sleeves and Inserts" for cutting and patching procedures.
 - 4. Division 1 Section "Summary of Work" within the Technical Specifications for Asbestos Abatement.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for re-use.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 SUBMITTALS

- A. Qualification Data: For demolition firm.
- B. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

- C. Pre-demolition Photographs or Videotapes: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Comply with Division 1 Section "Construction Photographs." Submit before Work begins.

1.5 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Standards: Comply with ANSI A10.6 and NFPA 241.

1.6 PROJECT CONDITIONS

- A. Owner will occupy the building in which the selective demolition will occur. Conduct selective demolition so Owner's operations will not be disrupted.
 - 1. Comply with requirements specified in Division 1 Section "Summary of Work."
 - a. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- B. Notify Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work-
 - 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Engineer and Owner so that provisions may be made to remove and dispose of all hazardous materials in strict accordance with all applicable federal, state, and local regulations.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 PRODUCTS (Not Used)

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.

- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. Survey of Existing Conditions: Record existing conditions by use of measured drawings and pre-construction photographs or preconstruction videotapes.
- E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
 - 1. Comply with requirements for existing services/systems interruptions specified in Division 1 Section "Summary of Work."
- B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
 - a. Where entire wall is to be removed, existing services/systems may be removed with removal of the wall.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Comply with requirements for access and protection specified in Division 1 Section "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.

3. Protect walls and other existing finish work that are to remain or that are exposed during selective demolition operations.
 4. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 1 Section "Temporary Facilities and Controls."
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to pre-serve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 5. Remove structural members and lower to ground by method suitable to avoid free fall and to pre-vent ground impact or dust generation.
 6. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls or adjacent construction.
 7. Dispose of demolished items and materials promptly.
- B. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- C. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Engineer, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power driven saw, then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION



SECTION 025100
WATER DISTRIBUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes water-distribution piping for a yard hydrant.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.
- C. Operation and Maintenance Data: For water valves and specialties to include operation and maintenance manuals.
- D. Yard hydrant location to be field-approved by Landscape Architect and Owner.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - A. Comply with requirements of utility company supplying water. Include tapping of water mains.
 - B. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.
- B. Piping materials shall bear label, stamp, or other markings of specified testing agency.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Preparation for Transport: Prepare valves, according to the following:
 - A. Ensure that valves are dry and internally protected against rust and corrosion.
 - B. Protect valves against damage to threaded ends and flange faces.
 - C. Set valves in best position for handling. Set valves closed to prevent rattling.
- B. During Storage: Use precautions for valves, according to the following:
 - A. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
 - B. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
- C. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- D. Protect flanges, fittings, and specialties from moisture and dirt.

PART 2 - PRODUCTS

2.1 DUCTILE-IRON PIPE AND FITTINGS

- A. Mechanical-Joint, Ductile-Iron Pipe: AWWA C151, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.
 - A. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
 - B. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.
- B. Push-on-Joint, Ductile-Iron Pipe: AWWA C151, with push-on-joint bell and plain spigot end unless grooved or flanged ends are indicated.
 - A. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
 - B. Gaskets: AWWA C111, rubber.

2.2 CORPORATION VALVES AND CURB VALVES

- A. Manufacturers:
 - A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Ford Meter Box Company, Inc. (The); Pipe Products Div.
 2. Grinnell Corporation.
 3. Or approved comparable product.
- B. Service-Saddle Assemblies: Comply with AWWA C800. Include saddle and valve compatible with tapping machine.
 - A. Service Saddle: Copper alloy with seal and AWWA C800, threaded outlet for corporation valve.
 - B. Corporation Valve: Bronze body and ground-key plug, with AWWA C800, threaded inlet and outlet matching service piping material.
- C. Curb Valves: Comply with AWWA C800. Include bronze body, ground-key plug or ball, and wide tee head, with inlet and outlet matching service piping material.
- D. Service Boxes for Curb Valves: Similar to AWWA M44 requirements for cast-iron valve boxes. Include cast-iron telescoping top section of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over curb valve and with a barrel approximately 3 inches in diameter.
 - A. Shutoff Rods: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve.

2.3 YARD HYDRANT

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Frostproof Yard Hydrant as manufactured by Campbell Manufacturing, Inc., 127 East Spring Street, PO Box 207, Bechtelsville, PA 19505, 800-523-0224, or approved comparable product:
 - A. Bury Depth: 3-feet minimum. Coordinate bury depth with field approved head and handle mounting height.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS

- A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.
- B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used, unless otherwise indicated.
- C. Do not use flanges or unions for underground piping.
- D. Flanges, unions, grooved-end-pipe couplings, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.
- E. Underground water-service piping shall be any of the following:
 - A. Ductile-iron, push-on-joint pipe; ductile-iron, push-on-joint fittings; and gasketed joints.

3.3 PIPING INSTALLATION

- A. Water-Main Connection: Tap water main according to requirements of water utility company and of size and in location indicated.
- B. Install ductile-iron, water-service piping according to AWWA C600 and AWWA M41.
- C. Bury piping with depth of cover over top at least 36 inches.
- D. Extend water-service piping and connect to water-supply source and yard hydrant-water-piping systems in location indicated.
 - A. Terminate water-service piping at yard hydrant location until water-piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to water-piping systems when those systems are installed.
- E. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.

3.4 JOINT CONSTRUCTION

- A. Make pipe joints according to: Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.

3.5 ANCHORAGE INSTALLATION

- A. Anchorage, General: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include: Concrete thrust blocks.
- B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
 - A. Gasketed-Joint, Ductile-Iron, Water-Service Piping: According to AWWA C600.

3.6 VALVE INSTALLATION

- A. Corporation Valves and Curb Valves: Install each underground curb valve with head pointed up and with service box.

3.7 YARD HYDRANT INSTALLATION

- A. Install yard hydrants with valve below frost line and provide for drainage. Support in upright position. Include separate gate valve or curb valve and restrained joints in supply piping.

3.8 CONNECTIONS

- A. Connect water-distribution piping to existing water main. Use service clamp and corporation valve.
- B. Connect water-distribution piping to yard hydrant.

3.9 FIELD QUALITY CONTROL

- A. Piping Tests: Conduct piping tests before joints are covered and after concrete thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Hydrostatic Tests: Test at not less than one-and-one-half times working pressure for two hours.
 - A. Increase pressure in 50-psig increments and inspect each joint between increments. Hold at test pressure for 1 hour; decrease to 0 psig. Slowly increase again to test pressure and hold for 1 more hour. Maximum allowable leakage is 2 quarts per hour per 100 joints. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.
- C. Prepare reports of testing activities.

3.10 IDENTIFICATION

- A. Install continuous underground detectable warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping. Underground warning tapes are specified in Division 2 Section "Earthwork."

3.11 CLEANING

- A. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or do as follows:
 1. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for 24 hours.
 2. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
 3. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.
- B. Prepare reports of purging and disinfecting activities.

END OF SECTION



UNDERGROUND DUCTS AND UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Conduit, ducts, and duct accessories for direct-buried duct banks, and in single duct runs.
2. Excavating and backfilling for trenches.

1.2 DEFINITIONS

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

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

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

E. 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.

F. 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.

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

1.3 SUBMITTALS

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

B. Shop Drawings for Precast or Factory-Fabricated Underground Utility Structures: Include plans, elevations, sections, details, attachments to other work, and accessories, including the following:

1. Duct entry provisions, including locations and duct sizes.
2. Cover design.
3. Grounding details.
4. Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

C. Field quality-control reports.

1.4 PROJECT CONDITIONS

- A. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.

1.5 QUALITY ASSURANCE

- A. Comply with IEEE C2.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUIT

- A. Rigid Steel Conduit: Galvanized. Comply with ANSI C80.1.
- B. RNC: NEMA TC 2, Type EPC-40-PVC, UL 651, with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B.

2.2 NONMETALLIC DUCTS AND DUCT ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AFC Cable Systems.
 2. ARNCO Corporation.
 3. Cantex, Inc.
 4. Condux International, Inc.
 5. DCX-CHOL Enterprises, Inc.; ELECSYS Division.
 6. Electri-Flex Company.
 7. IPEX Inc.
 8. Lamson & Sessions; Carlon Electrical Products.
 9. Manhattan Wire Products; a Belden company.

B. Duct Accessories:

1. Duct Separators: Factory-fabricated rigid PVC interlocking spacers, sized for type and sizes of ducts with which used, and retained to provide minimum duct spacings indicated while supporting ducts during concreting or backfilling.
2. Warning Tape: Underground-line warning tape specified in Division 16 Section "Electrical Identification."
3. Concrete Warning Planks: Nominal 12 by 24 by 3 inches (300 by 600 by 76 mm) in size, manufactured from 6000-psi (41-MPa) concrete.
 - a. Color: Red dye added to concrete during batching.
 - b. Mark each plank with "ELECTRIC" in 2-inch- (50-mm-) high, 3/8-inch- (10-mm-) deep letters.

2.3 Soil: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

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 EARTHWORK

- A. Excavation and Backfill: Comply with Section 3.3, but do not use heavy-duty, hydraulic-operated, compaction equipment.
- B. Restore surface features at areas disturbed by excavation and reestablish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.
- C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include providing necessary topsoil, fertilizer, lime, seed, sod, mulch, and sprigging.

3.3 EXCAVATION FOR TRENCHES

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

- B. Excavate trenches to uniform widths to provide the following clearance on each side of 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 and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
 - 1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material, 4 inches (100 mm) deeper elsewhere, to allow for bedding course.

3.4 DUCT INSTALLATION

- A. Slope: Pitch ducts a minimum slope of 1:300 down away from buildings and equipment. Slope ducts from a high point in runs between two manholes to drain in both directions.
- B. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches, both horizontally and vertically, at other locations unless otherwise indicated.
- C. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.
- D. Building Wall Penetrations: Make a transition from underground duct to rigid steel conduit at least 10 ft. (3 m) outside the building wall without reducing duct line slope away from the building and without forming a trap in the line. Use fittings manufactured for duct-to-conduit transition. Install conduit penetrations of building walls as specified in Division 16 Section "Common Work Results for Electrical."
- E. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig (1.03-MPa) hydrostatic pressure.
- F. Pulling Cord: Install 200-lbf- (445-N-) test nylon cord in ducts, including spares.
- G. Direct-Buried Duct Banks:
 - 1. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.
 - 2. Space separators close enough to prevent sagging and deforming of ducts, with not less than 5 spacers per 20 ft. (6 m) of duct. Secure separators to earth and to ducts to prevent displacement during backfill and yet permit linear duct movement due to expansion and contraction as temperature changes. Stagger spacers approximately 6 inches (150 mm) between tiers.

3. Excavate trench bottom to provide firm and uniform support for duct bank. Prepare trench bottoms as specified for pipes less than 6 inches (150 mm) in nominal diameter.
4. Install backfill as specified in Section 3.4.
5. After installing first tier of ducts, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand-place backfill to 4 inches (100 mm) over ducts and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction as specified.
6. Install ducts with a minimum of 3 inches (75 mm) between ducts for like services and 6 inches (150 mm) between power and signal ducts.
7. Depth: Install top of duct bank at least 30 inches below finished grade unless otherwise indicated.
8. Set elevation of bottom of duct bank below the frost line.
9. Install manufactured duct elbows at building entrances through the wall unless otherwise indicated. Ducts should terminate in junction boxes (sized per NEC) at wall penetration locations.
10. Warning Planks: Bury warning planks approximately 12 inches (300 mm) above direct-buried ducts and duct banks, placing them 24 inches (600 mm) o.c. Align planks along the width and along the centerline of duct bank. Provide an additional plank for each 12-inch (300-mm) increment of duct-bank width over a nominal 18 inches (450 mm). Space additional planks 12 inches (300 mm) apart, horizontally.

3.5 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 (450 mm) of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Division 3 Section "Cast-in-Place Concrete".
- D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 6 inches (300 mm) over the pipe or conduit.
 1. 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.
- E. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- F. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.6 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers 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 D 698:
 - 1. Under turf or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 85 percent.
 - 2. For trenches, compact each layer of initial and final backfill soil material at 85 percent.

3.7 GROUNDING

- A. Ground underground ducts and utility structures according to Division 16 Section "Grounding and Bonding."

3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts.
 - 2. Pull aluminum or wood test mandrel through duct to prove joint integrity and test for out-of-round duct. Provide mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.
- B. Correct deficiencies and retest as specified above to demonstrate compliance.
- C. Prepare test and inspection reports.

3.9 CLEANING

- A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

3.10 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



SECTION 026300
STORM DRAINAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes gravity-flow, non-pressure storm drainage outside the building, with the following components:
 - 1. Cleanouts.
 - 2. Inlets.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For catch basins, include plans, elevations, sections, details, and catch basin frame, and grate.
- C. Coordination Drawings: Show pipe sizes, locations, and elevations.
- D. Field quality-control test reports: Furnish Product Data for each type of product indicated.

PART 2 - PRODUCTS

2.1 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 74, Extra-Heavy class.
- B. Gaskets: ASTM C 564, rubber.
- C. Calking Materials: ASTM B 29, pure lead, and oakum or hemp fiber.

2.2 NONPRESSURE-TYPE PIPE COUPLINGS

- A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground non-pressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.
- B. Sleeve Materials:
 - 1. For Cast-Iron Soil Pipes: ASTM C 564, rubber.

2. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
- C. Unshielded Flexible Couplings: Elastomeric sleeve with stainless-steel shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
1. Manufacturers:
 - a. Dallas Specialty & Mfg. Co.
 - b. Fernco Inc.
 - c. Logan Clay Products Company (The).
 - d. Mission Rubber Company; a division of MCP Industries, Inc.
 - e. NDS Inc.
 - f. Plastic Oddities, Inc.
- D. Shielded Flexible Couplings: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
1. Manufacturers:
 - a. Cascade Waterworks Mfg.
 - b. Dallas Specialty & Mfg. Co.
 - c. Mission Rubber Company; a division of MCP Industries, Inc.
- E. Ring-Type Flexible Couplings: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.
1. Manufacturers:
 - a. Fernco Inc.
 - b. Logan Clay Products Company (The).
 - c. Mission Rubber Company; a division of MCP Industries, Inc.

2.3 CLEANOUTS

- A. Gray-Iron Cleanouts: ASME A112.36.2M, round, gray-iron housing with clamping device, and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection, and countersunk, tapered-thread, brass closure plug.
1. Manufacturers:
 - a. Josam Company.
 - b. MIFAB Manufacturing Inc.
 - c. Smith, Jay R. Mfg. Co.
 - d. Wade Div.; Tyler Pipe.
 - e. Watts Industries, Inc.
 - f. Watts Industries, Inc.; Enpoco, Inc. Div.

2. Top-Loading Classification(s): Heavy duty.
3. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

2.4 INLETS

- A. Standard Precast Concrete Inlets: ASTM C 478 precast, reinforced concrete, of depth indicated, with provision for sealant joints.
 1. Base Section: 6-inch minimum thickness for floor slab and 6-inch minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
 2. Top Section: as indicated on Contract drawings.
 3. Joint Sealant: ASTM C 990 bitumen or butyl rubber.
- B. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron designed for A-16, structural loading. Include 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange, and grate as indicated on Contract drawings.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

- A. Pipe couplings and fittings with pressure ratings at least equal to piping rating may be used in applications below, unless otherwise indicated.
 1. Use non-pressure-type flexible couplings where required to join gravity-flow, non-pressure sewer piping, unless otherwise indicated.
 - a. Unshielded flexible couplings for same or minor difference OD pipes.
 - b. Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.
 - c. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.
- B. Gravity-Flow, Non-Pressure Sewer Piping:
 1. NPS 3 to NPS 6 (DN 80 to DN 150): Hub-and-spigot, Extra-Heavy class, cast-iron soil pipe and fittings; and gasketed joints.

3.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.
- C. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- D. Install gravity-flow, non-pressure drainage piping according to the following:
 - 1. Install piping pitched down in direction of flow.
 - 2. Install hub-and-spigot, cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook."
 - 3. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
- E. Clear interior of piping and manholes of dirt and superfluous material as work progresses.

3.3 PIPE JOINT CONSTRUCTION

- A. Basic pipe joint construction is specified in Division 2 Section "Piped Utilities - Basic Materials and Methods." Where specific joint construction is not indicated, follow piping manufacturer's written instructions.
- B. Join gravity-flow, non-pressure drainage piping according to the following:
 - 1. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
 - 2. Join hub-and-spigot, cast-iron soil piping with calked joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead and oakum calked joints.
 - 3. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-gasket joints.
 - 4. Join dissimilar pipe materials with non-pressure-type flexible couplings.

3.4 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
 - 1. Use heavy-duty, top-loading classification cleanouts in vehicle-traffic service areas.

- B. Set cleanout frames and covers in earth in cast-in-place-concrete block, 18 by 18 by 12 inches deep. Set with tops 1 inch above surrounding grade.
- C. Set cleanout frames and covers in concrete pavement with tops flush with pavement surface.

3.5 INLET INSTALLATION

- A. Set frames and grates to elevations indicated.

3.6 CONNECTIONS

- A. Make connections to existing piping.
 - 1. Use commercially manufactured Y fittings for piping branch connections. Remove section of existing pipe; install Y fitting into existing piping; and encase entire Y fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.

3.7 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
 - 1. Submit separate report for each system inspection.
 - 2. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
 - c. Crushed, broken, cracked, or otherwise damaged piping.
 - d. Infiltration: Water leakage into piping.
 - e. Ex-filtration: Water leakage from or around piping.
 - 3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
 - 4. Re-inspect and repeat procedure until results are satisfactory.
- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
 - 1. Do not enclose, cover, or put into service before inspection and approval.
 - 2. Test completed piping systems according to requirements of authorities having jurisdiction.
 - 3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
 - 4. Submit separate report for each test.

5. Air Tests: Test storm drainage according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
 - a. Option: Test plastic gravity sewer piping according to ASTM F 1417.
- C. Leaks and loss in test pressure constitute defects that must be repaired.
- D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

END OF SECTION



SECTION 027510
SITE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Pavement.
 - 2. Curbs.
 - 3. Footings.
 - 4. Pole light foundations.
- B. Related Sections:
 - 1. Division 2 Section "Tree Protection and Trimming".
 - 2. Division 2 Section "Earthwork".
 - 3. Division 2 Section "Site Furnishings".

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Action Submittals:
 - 1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Material Certificates: For the following, from manufacturer:
 - 1. Cementitious materials.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Fiber reinforcement.
 - 4. Admixtures.
 - 5. Curing compounds.
 - 6. Applied finish materials.
 - 7. Bonding agent or epoxy adhesive.
 - 8. Joint fillers.
- D. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").
- B. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
- C. Concrete Testing Service: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.
- D. ACI Publications: Comply with ACI 301 unless otherwise indicated.
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockups of full-thickness sections of concrete paving to demonstrate typical joints; surface finish, texture, and color; curing; and standard of workmanship.
 - 2. Build mockups of concrete paving in the location where directed by Landscape Architect and not less than 10-feet wide by 20-feet long.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Landscape Architect specifically approves such deviations in writing.
 - 4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- F. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to concrete paving, curbs and footings, including but not limited to, the following:
 - a. Concrete mixture design.
 - b. Quality control of concrete materials and construction practices.
 - 2. Require representatives of each entity directly concerned with site concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Concrete paving subcontractor.

1.6 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.
 - 1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.
- B. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60, deformed bars; assembled with clips.
- C. Epoxy-Coated, Joint Dowel Bars: ASTM A 775/A 775M; with ASTM A 615/A 615M, Grade 60, plain-steel bars.
- D. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.
- E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:
 - 1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:
 - 1. Portland Cement: ASTM C 150, gray portland cement Type I:
 - a. Fly Ash: ASTM C 618, Class F.
 - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C 33, Class 4S, uniformly graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: Potable and complying with ASTM C 94/C 94M.
- D. Air-Entraining Admixture: ASTM C 260.
- E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.

2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.4 FIBER REINFORCEMENT

- A. Synthetic Fiber: Monofilament or fibrillated polypropylene fibers engineered and designed for use in concrete paving, complying with ASTM C 1116/C 1116M, Type III, 1/2 to 1-1/2 inches long.
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Monofilament Fibers:
 - 1) Axim Italcementi Group, Inc.; FIBRASOL II P.
 - 2) Euclid Chemical Company (The), an RPM company; Fiberstrand 100, Fiberstrand 150.
 - 3) FORTA Corporation; FORTA ECONO-MONO or FORTA Mighty-Mono.
 - 4) Grace, W. R. & Co. - Conn.; Grace MicroFiber.
 - 5) Metalcrete Industries; Polystrand 1000.
 - 6) QC Construction Products; QC FIBERS.
 - b. Fibrillated Fibers:
 - 1) Axim Italcementi Group, Inc.; FIBRASOL F.
 - 2) Euclid Chemical Company (The), an RPM company; Fiberstrand F.
 - 3) FORTA Corporation; FORTA Econo-Net or FORTA Super-Net.
 - 4) Grace, W. R. & Co. - Conn.; Grace Fibers.
 - 5) Propex Concrete Systems Corp.; Fibermesh 300.

2.5 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

2.6 RELATED MATERIALS

- A. Expansion Joint Fillers: Premolded joint filler, AASHTO M 153 Type 1 in preformed strips. Color: Light Gray.

2.7 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
- B. Proportion mixtures to provide normal-weight concrete with the following properties:
 - 1. Compressive Strength (28 Days): 3000 psi.
 - 2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
 - 3. Slump Limit: 3 inches.
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
 - 1. Air Content: 6 percent plus or minus 1.5 percent for 3/4-inch nominal maximum aggregate size.
- D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use high-range, water-reducing and retarding admixture in concrete as required for placement and workability.
 - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
- F. Cementitious Materials: Limit percentage by weight of cementitious materials other than portland cement according to ACI 301 requirements as follows:
 - 1. Fly Ash or Pozzolan: 25 percent.
- G. Synthetic Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd.

2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.
 - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 - 1. For concrete batches of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 - 2. For concrete batches larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
 - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

3.5 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.
 - 1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.
 - 1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
 - 2. Provide tie bars at sides of paving strips where indicated.
 - 3. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.

4. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.
1. Locate expansion joints at intervals as shown on Drawings.
 2. Extend joint fillers full width and depth of joint.
 3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
 4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
 5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
- D. Control Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows, to match jointing of existing adjacent concrete paving:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 3/8-inch radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate grooving-tool marks on concrete surfaces.
 - a. Tolerance: Ensure that grooved joints are within 3 inches either way from centers of dowels.
 2. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
- E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 3/8-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.
- B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.
- F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- G. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement dowels and joint devices.
- H. Screed paving surface with a straightedge and strike off.
- I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- J. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:
1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
 2. Do not use frozen materials or materials containing ice or snow.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.
- K. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
1. Medium Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 deep with a stiff-bristled broom, perpendicular to line of traffic creating a uniform texture.

3.8 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations.

Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound or a combination of these as follows:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period using cover material and waterproof tape.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

3.9 PAVING TOLERANCES

- A. Comply with tolerances in ACI 117 and as follows:
 - 1. Elevation: 1/2 inch.
 - 2. Thickness: Plus 3/8 inch, minus 1/4 inch.
 - 3. Surface: Gap below 10-foot-long, unlevelled straightedge not to exceed 1/4 inch.
 - 4. Lateral Alignment and Spacing of Dowels: 1 inch.
 - 5. Vertical Alignment of Dowels: 1/4 inch.
 - 6. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
 - 7. Joint Spacing: 3 inches.
 - 8. Contraction Joint Depth: Plus 1/4 inch, no minus.
 - 9. Joint Width: Plus 1/8 inch, no minus.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain at least one composite sample for each truck or batch of each concrete mixture placed each day.
 - 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.
 - a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- D. Test results shall be reported in writing to Landscape Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Owner's Representative but will not be used as sole basis for approval or rejection of concrete.
- F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Owner's Representative.
- G. Concrete paving will be considered defective if it does not pass tests and inspections. Remove and replace concrete pavement at no additional cost to the Owner.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- I. Prepare test and inspection reports.

3.11 REPAIRS AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Landscape Architect.
- B. Drill test cores, where directed by Owner's Representative, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.
- C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION

Project No. 14-18-4745-01
Health Care Center #10 - Interior and Exterior Improvements
027510-10
SITE CONCRETE



SECTION 027800

UNIT PAVING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Extent of work is shown on Drawings and includes but is not limited to:
 - 1. Pedestrian concrete unit pavers on bituminous setting bed.

1.3 RELATED SECTIONS

- A. Division 2 Section "Earthwork" for excavation and compacted subgrade.
- B. Division 2 Section "Site Concrete" for concrete base under unit pavers and for cast-in-place concrete curbs and gutters serving as edge restraint for unit pavers.

1.4 REFERENCES

- A. The following apply to work in this Section:
 - 1. ASTM: Specifications of the American Society for Testing and Materials latest editions. Modifications specified herein shall govern where conflicts with ASTM standards occur.

1.5 SUBMITTALS

- A. Submit prior to delivery of materials to site.
- B. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- C. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include wider range if variation of finish is anticipated.
 - 1. Sand, 1/2 lb. bag.
 - 2. Concrete unit pavers.
 - 3. Edge Restraint.

1.6 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers that have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Construction Tolerance: Unit-to-unit offset tolerance of 1/32 inch from flush and 1/8 inch in 10 feet from level or required slope.
- C. Construction Tolerance: Unit-to-unit offset tolerance of 1/16 inch from flush, 1/8 inch in 2 feet and 1/4 inch in 10 feet from level or required slope.

- D. Field-Constructed Mock-ups: Provide sample panel of each type of unit paving as specified herein. Build mock-ups in place at the site and obtain Landscape Architect's acceptance of visual qualities of sample panels before commencing work. Replace unsatisfactory mock-up work until acceptance is obtained. Mock-up may be used as part of the work if conforming to specified requirements and accepted by Landscape Architect and Owner. Accepted mock-up establishes minimum standard of quality and workmanship for paver work.
1. Build 5' x 5' panels of full thickness using pavers, setting and joint materials, and edge conditions.
 - a. Pedestrian concrete unit pavers on bituminous bed.
 2. If initial mock-up is rejected, build additional mock-ups to arrive at desired features. Retain all mock-ups until acceptable mock-up is selected by Landscape Architect. Retain and protect acceptable mock-up during construction as standard for judging work. Do not alter, move, damage or destroy mock-up until work is complete.
 3. Acceptable mock-ups may become part of the permanent installation.

1.7 DELIVERY STORAGE AND HANDLING

- A. Deliver, store, handle and protect all materials from damage.
- B. Handle pavers to prevent chipping, breakage, soiling, or other damage.
- C. Store pavers on wood skids or pallets, covered with non-staining, waterproof membrane. Place and stack skids and pavers to distribute weight evenly and to prevent breakage and cracking.

1.8 PROJECT CONDITIONS

- A. Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Concrete unit pavers: Belgard Hardscapes, 975 Burnt Tavern Road, Brick, NJ 08724, 1800 682-5625, www.AnchorCP.com.
- B. Edge Restraint: Permaloc Corporation, 13505 Barry Street, Holland, Michigan 49424, 1 (800) 356-9660.

2.2 MATERIALS

- A. Pedestrian concrete unit pavers: Holland Stone, 4" x 8" x 2 1/4".
 1. Color A: light gray color, final color selection to be approved by Owner.
 2. Color B: charcoal color, final color selection to be approved by Owner.
- B. Bituminous setting bed for vehicular unit pavers:
 1. Asphalt cement: conform to ASTM D3381, viscosity grade A.C. 10 or A.C. 20.
 2. Fine Aggregate: clean, hard sand with durable particles and free from adherent coatings, lumps of clay, alkali salts and organic matters, uniformly graded with all passing No. 4 sieve and meeting gradation requirements of ASTM C136.
 3. Bituminous mix shall be 7% cement asphalt and 93% fine aggregate by weight and heated to approximately 300 degrees F at the asphalt plant.

4. Neoprene-modified asphalt adhesive tack coat
 - a. Mastic
 - Solids (base): 75 +/- 1%
 - Lbs./Gal.: 8-8.5 lb.
 - Solvent: Varsol (over 100 degrees F flash)
 - b. Base (2% neoprene, 10% fibers, 88% asphalt)
 - Melting point (ASTM D36): 150 degrees F min.
 - Penetration – 77 degrees F 100 gram load 5 second (.1mm) 23-27
 - Ductility (ASTM D133-44) @ 25 degrees C, 5 cms per minute 100-125

- C. Joint filler for pavers: 5:1 mix of sand, conforming to ASTM C-144 and cement, clean, washed, well graded and free of deleterious materials.

- D. Edge Restraint: PermaLoc AsphaltEdge, 2” x 2-1/4”, Mill Finish.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify substrate is level, smooth, capable of supporting pavers and imposed loads, and ready to receive Work of this section.
 1. Verify that concrete substrate has cured at least 28 days and attained 75 percent design strength.
 2. Vacuum clean concrete substrates to remove dirt, dust, debris and loose particles.
 3. Verify that gradients and elevations of substrate are correct.

- B. Beginning installation means acceptance of existing conditions.

- C. Stake out lines of work and seek approval of Owner and Landscape Architect.

3.2 INSTALLATION OF SAND SETTING BED, PAVERS AND JOINT FILLER

- A. Install edge restraint according to manufacturer's recommendations, in locations indicated on Drawings.

- B. Place bituminous setting bed.
 1. Use control bars to control the depth of the bituminous setting bed. Place bituminous between control bars and strike off. Fill low spots with more bituminous material to produce smooth, even, firm setting bed.
 2. Screed setting bed with power roller to nominal depth of 3/4" while still hot.

- C. Apply coat of neoprene-modified asphalt adhesive.

- D. Place paver units in pattern indicated on Drawings.
 3. Maintain proper joint alignment and pattern as indicated on Drawings.
 4. Protect newly laid pavers with plywood panels placed over pavers where installers stand.
 5. Cut pavers as required and as shown on Drawings. Machine saw partial units.
 6. Roll pavers if necessary to achieve additional leveling, before installing joint filler, after heat has built-up in the surface from several days of hot weather.

- E. Sweep joint filler into joints. Remove surplus joint filler from surface of pavement.
- F. Remove and replace pavers which are loose, out of line or grade, chipped, broken, stained or otherwise damaged or if units do not match adjoining units as intended or present a tripping hazard. Provide new units and install in same manner as original units, with same joint treatment to eliminate evidence of replacement.

3.3 PROTECTION OF FINISHED WORK

- A. Do not permit construction traffic over unprotected paver surface.
- B. Protect permeable pavement system from sediment deposition and damage due to subsequent construction activity.

3.4 CLEAN UP

- A. Maintain the site in an orderly condition during the progress of work. Promptly remove debris and trash. Leave the site in a neat, orderly condition, broom clean.

END OF SECTION

SECTION 028260
ORNAMENTAL METAL FENCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Decorative steel fences.
- B. Related Sections:
 - 1. Division 2 Section "Earthwork".
 - 2. Division 2 Section "Site Concrete".

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification:
 - 1. Provide Samples for all components indicated at least 12 inches in length with final finish specified.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code – Steel".
- C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Include 9-foot minimum length of fence complying with requirements.
 - 2. Approved mockups may become part of the completed Work.
 - 3. Mockup shall be reviewed at fabricators shop.
- D. Pre-installation Conference: Conduct conference at Project site.

1.5 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: The design for the ornamental metal fence is based on the following product by Northeast Fence & Iron Works, 8451 Hegerman Street, Philadelphia, PA 19136; Phone: (215) 335-1681.
 - 1. “Westmoreland 2” Tubular Steel Fence

2.2 STEEL AND IRON

- A. Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Bars (Pickets): Hot-rolled, carbon steel complying with ASTM A 29/A 29M, Grade 1010.
- C. Tubing: ASTM A 500, cold formed steel tubing.
- D. Bar Grating: NAAMM MBG 531.
 - 1. Bars: Hot-rolled steel strip, ASTM A 1011/A 1011M, Commercial Steel, Type B.
 - 2. Wire Rods: ASTM A 510.
- E. Castings: Either gray or malleable iron unless otherwise indicated.
 - 1. Gray Iron: ASTM A 48/A 48M, Class 30.
 - 2. Malleable Iron: ASTM A 47/A 47M.
- F. Fabrication: Fabricate bar grating infill into sections of size indicated.
 - 1. Fabricate rails with clips welded to rails for fastening to posts in field.
 - 2. Drill posts, clips, and bar grating for fasteners before finishing to maximum extent possible.
- G. Finish exposed welds to comply with NOMMA Guideline 1, Finish #4 - good-quality, uniform undressed weld with minimal splatter.
- H. Finish for Steel Items: Primed and shop painted.
 - 1. Surface Preparation: Clean surfaces according to SSPC-SP 5/NACE No. 1, “White Metal Blast Cleaning”.
 - 2. Primer Application: Apply primer immediately after cleaning.

2.3 COATING MATERIALS

- A. Shop Primers for Steel: Provide Primer, Alkyd, Anti-Corrosive for Metal: MPI #79.
- B. Alkyd, Exterior, Semi-Gloss (Gloss Level 5): MPI #94.
 - 1. Color: Selected by Owner

2.4 MISCELLANEOUS MATERIALS

- A. Nonshrink Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107 and specifically recommended by manufacturer for exterior applications.
- B. Fasteners: Stainless-steel carriage bolts and tamperproof nuts.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, and other conditions affecting performance of the Work.
- B. Do not begin installation before final grading is completed unless otherwise permitted by Owner.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION, GENERAL

- A. Stake locations of fence lines and posts.

3.3 PREPARATION, FINISH

- A. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.
- B. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

3.4 APPLICATION, FINISH

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
- B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.5 DECORATIVE FENCE INSTALLATION

- A. Install fences according to manufacturer's written instructions.
- B. Install fences by setting posts as indicated. Peen threads of bolts after assembly to prevent removal.
- C. Post Setting: Set posts in concrete at indicated spacing.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete.
 - 2. Protect aboveground portion of posts from concrete splatter.
 - 3. Posts Set into Voids in Concrete: Form or core drill holes not less than 3/4 inch larger than outside diagonal dimension of post.
 - a. Extend posts at least 5 inches into concrete or manufacturer's recommendations, whichever is greater.

- b. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink grout, mixed and placed to comply with grout manufacturer's written instructions. Finish and slope top surface of grout to drain water away from post.

3.6 CLEANING AND PROTECTION

- A. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- B. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Owner, and leave in an undamaged condition.
- C. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

END OF SECTION



SECTION 028700
SITE FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
1. Benches.
 2. Game Tables.
 3. Players Bench (at basketball court).
 4. Bicycle racks.
 5. Trash Receptacles.
 6. Pet Waste Disposal.
 7. Bollards.
- B. Related Sections
1. Division 2 Section "Earthwork".
 2. Division 2 Section "Tree Protection and Trimming".
 3. Division 2 Section "Site Concrete".

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated, including finish and color information.
- B. Maintenance Data: For site furnishings to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of site furnishing(s) through one source from a single manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Anchors, Fasteners, Fittings, and Hardware: Provide Stainless steel; commercial quality, tamperproof, vandal and theft resistant unless indicated otherwise on the Drawings.

- B. Non-shrink, Nonmetallic Grout: Premixed, factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107; recommended in writing by manufacturer, for exterior applications.
- C. Erosion-Resistant Anchoring Cement: Factory-packaged, non-shrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound; resistant to erosion from water exposure without needing protection by a sealer or waterproof coating; recommended in writing by manufacturer, for exterior applications.

2.2 BENCHES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide furnishings manufactured by Victor Stanley, Dunkirk, MD 20754, 800-368-2573, or approved comparable product.
 - 1. Model: Goblet Series, FR-7, 6-foot long.
 - 2. Finish / Color: Powdercoat / Black.
 - 3. Seating: Ipe.
 - 4. Customization: Center armrest per manufacturer.

2.3 GAME TABLES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide furnishings manufactured by Maglin Site Furniture, 27 Bysham Park Drive, Woodstock, ON, N4T 1P1, 800-716-5506 or approved comparable product.
 - 1. Model: MLPT 1104BW.
 - 2. Finish / Color: Powdercoat / Black.
 - 3. Seating: Ipe.
 - 4. Customization: MGB100W Gaming Board.

2.4 PLAYERS BENCH

- A. Basis-of-Design Product: Subject to compliance with requirements, provide BCI Burke Co., LLC, Local Sales Representative: Sam Much, Recreation Resource, Inc., 204 South Willow St., Kennett Square, PA 19348, 610-444-4402, email: info@recreation-resource.com, or approved comparable product.
 - 1. Product Name: 8-ft Traditional Series Backless Bench.
 - 2. Model: 580-1009.
 - 3. Color: Black.

2.5 BICYCLE RACKS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide furnishings manufactured by Secure Site Designs LLC, Dunkirk, MD 20754, 1-888-268-4726, or approved comparable product.
1. Model: BRHS-101 (Surface Mount).
 2. Material / Finish: Galvanized Steel.
 3. Installation: Per Drawings and manufacturers instructions.

2.6 TRASH RECEPTACLES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide furnishings manufactured by Victor Stanley, Dunkirk, MD 20754, 800-368-2573, or approved comparable product.
1. Model: Concourse Series, FC-12 with Standard Tapered Formed Lid.
 2. Finish / Color: Powdercoat / Black.
 3. Capacity: 36 gal.
 4. Inner Container: Rigid plastic container with drain holes and lift-out handles; designed to be removable and reusable.

2.7 PET WASTE DISPOSAL

- A. Basis-of-Design Product: Subject to compliance with requirements, provide furnishings manufactured/supplied by Zero Waste USA Inc., 12310 World Trade Drive, #107, San Diego, CA 92128, 800-789-2563, or approved comparable product.
1. Post Model: JJB-UP, U-Channel Post.
 2. Sign Model: ZW-Station Sign.
 3. Bag Dispenser: JJB008 Zero Waste Dispenser.
 4. Bag Type: JJB002-MZW Zero Waste Bags (Case).
 5. Finish / Color: Black.

2.8 BOLLARD

- A. Basis-of-Design Product: Subject to compliance with requirements, provide furnishings as supplied by Creative Pipe, Rancho Mirage, California 92270-1087, 1.800.644.8467, or approved comparable product.
1. Model: ELBR-6-LRE-P-SS-D-IH-HHC-SS.
 2. Finish / Color: Powdercoat / Black.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Owner and Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.
- B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.
- C. Install site furnishings level, plumb, true, and securely anchored and positioned at locations indicated on Drawings. Obtain approval in the field by Owner prior to securing furnishings in place. Do not anchor furnishings without approval from Owner.
- D. Embedded Installations: Smooth top of concrete or anchoring cement and shaped to shed water. Protect visible portion of furnishings from concrete or anchoring cement splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete or anchoring cement is sufficiently cured.

3.3 CLEANING AND PROTECTION

- A. After completing site furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.
- B. Protect finishes of furnishings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION



SECTION 029100
SOILS PREPARATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Extent of work is shown on Drawings and includes but is not limited to:
 1. Stripping and stockpiling of existing topsoil (Salvaged Topsoil).
 2. Supply of compost.
 3. Preparation of subgrade and finish grade.
 4. Installation of existing topsoil and in-situ compost amendment.
 5. Clean up.

1.3 RELATED SECTIONS

- A. Section 02930 – Exterior Planting

1.4 REFERENCES

- A. The following apply to work in this Section:
 1. Agricultural Chemist: Qualified, experienced public or private soils testing laboratory, capable of providing test results as specified.

1.5 SUBMITTALS

- A. Samples: Submit loose materials in a sealed one-gallon resealable plastic bag.
 1. Compost
- B. Test reports:
 1. Submit this specification section and material samples to approved testing agency.
 2. Perform all tests required to provide specified results noted in the "Materials" section herein.
 3. Compost must be approved by Landscape Architect prior to use.
 4. The submittal process must commence early enough to allow for testing time, submittal review time, and material delivery time.
- C. Testing Agencies: Provide test data from one of the following:

1. University of Massachusetts Soil and Plant Tissue Testing Laboratory, West Experiment Station, 682 North Pleasant Street, Amherst, MA 01003, phone 413-545-2311, fax 413-545-1931.
 2. Penn State Agricultural Analytical Services Laboratory, University Park, PA 16802, phone 814-863-0841, fax 814-863-4540.
 3. Rutgers Agricultural Experiment Station, Soil Testing Laboratory, PO Box 902, Milltown, NJ 08850, phone 732-932-9295, email soiltest@njaes.rutgers.edu.
 4. Or other qualified laboratory approved by the Landscape Architect.
- D. Samples and Test Reports: Submittals must be clearly labeled with the following information:
1. Project title.
 2. Name of contractor.
 3. Name of source / supplier.
 4. Name of testing agency with contact information.
 5. Name of material.
 6. Date material was sampled from source / supplier.
 7. Date material was tested in the lab.
 8. Test type including reporting units.
 9. Test results.

1.6 SEQUENCING AND SCHEDULING

- A. Coordinate work of this Section with work of all other Sections of Specification.

PART 2 – PRODUCTS

2.1 COMPOST

- A. The organic amendment shall be a stable, mature aerobically composted yard debris (green waste) or composted leaf humus. Woodchip bulked biosolids, sewage sludge, peat, peat-humus and mushroom compost products are NOT ACCEPTABLE. Material must be composted for a minimum of one (1) year.
- B. Quality: Homogeneous material essentially free of soil clods, lumps, roots and stones. The compost shall have a man-made foreign material (hard plastics, metal, glass, etc.) content less than 1.5% as material retained on a U.S. Std. No.5 (4 mm) sieve (TMECC 03.06).
- C. The compost shall be screened such that a minimum of 90% passes a U.S. Std. 3/4" sieve and that no more than 10% passes a U.S. Std. No.10 sieve on a dry weight basis.
- D. pH shall fall between 6.5 to 7.5.
- E. Soluble salts content shall be less than 3.0 millimhos per cm and shall be determined by electrical conductivity of a 1:2 soil/water sample reported in millimhos per cm.
- F. Organic matter content shall be 40% or higher (% oven dry weight) and shall be as determined by ASTM F1647-02a, loss-on-ignition.
- G. Carbon to nitrogen (C:N) ratio shall fall between 12:1 to 30:1.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that excavation and rough grading is complete.
- B. Do not begin work until all other work is complete.
- C. Beginning installation means acceptance of existing conditions.

3.2 PREPARATION OF SUBGRADE

- A. Do not disc, roto-till, grade, blend, or work any soil when frozen, excessively wet or muddy, or in an otherwise unsatisfactory condition that will exacerbate compaction or destruction of soil structure.
- B. On-site and off-site stockpiles should be no more than 6 feet in height to prevent anaerobic conditions within the pile(s). Composts should be turned weekly to prevent excessive water absorption and blowing by winds, or as approved by the Landscape Architect.
- C. Subgrade shall be defined as shown on Drawings. The entire subgrade shall then be raked and all stones over 1-1/2", rubbish and general debris removed.

3.3 PREPARATION AND PLACEMENT OF SOIL

- A. Before topsoil is blended with organic matter, re-handle and re-pile the topsoil to make a uniform topsoil supply, free of subsoil lenses and other irregularities.
- B. Till the existing subgrade. Till depth shall be 4-inches minimum.
- C. Place Salvaged Topsoil by spreading Salvaged Topsoil atop tilled subgrade in areas designated for planting as shown on Drawings. Create smooth even surfaces. Place and spread Salvaged Topsoil to a depth sufficiently greater than the depth shown on drawings so that after settlement the completed work will conform to the lines, grades, and elevations shown or otherwise indicated.
- D. Grading Tolerances: All finished grades shall drain to established drainage points. Planting areas shall be fine graded within 1" of grades indicated on the Drawings. Maintain all flat areas and slopes to allow free flow of surface drainage without ponding.
 - 1. Fine grade by mechanical or hand raking leaving no exposed stones, earthen clods or debris greater than one half (1/2") diameter. Planted areas are to be brought to finish grades, filling as needed or removing surplus soil and floating areas to a smooth, uniform grade as indicated on the Grading Plan. Roll, rake, remove ridges and fill depressions as required to meet finish grades. Create smooth even surfaces. Allow for natural settlement.
 - 2. Do not spread frozen or muddy soil.
 - 3. Fine grading shall be interpreted as giving positive drainage.
 - 4. All fine grading is to be inspected by the Landscape Architect prior to the placement of sod/seed and installation of plants. The Contractor shall request the inspection three days prior to the placement of the sod/seed and installation of plants.
- E. Salvaged Topsoil compaction shall not exceed 85% Proctor density. Proposed method of settlement shall be as previously approved by the Landscape Architect. Method may include, but is not limited to, natural settlement over an approved period of time, hand-tamping, and/or light

rolling. In-situ density testing on installed Salvaged Topsoil may be requested if deemed necessary by the Landscape Architect at the Contractors expense.

1. For seeded areas only, roll the whole surface with a hand roller weighing approximately one hundred pounds (100 lb.) per foot (12") of roller width. During rolling, fill all depressions caused by settlement with additional soil and then re-grade. Lightly roll and rake until the surface presents a smooth, even, and uniform finish that is at required grade.

3.4 CLEAN UP

- A. Maintain the site in an orderly condition during the progress of work. Promptly remove debris and trash. Leave the site in a neat, orderly condition, broom clean.

END OF SECTION



SECTION 029110

PLANTING SOIL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. This Section includes all labor materials, equipment and testing services necessary to complete soils preparation, mixing and placement as shown on the Drawings and as specified herein, included but not necessarily limited to:
 1. Preparation of subgrade.
 2. Furnish and install imported Topsoil.
 3. Furnish and install in-situ Compost amendment.
 4. Fine grading and compaction mitigation.
 5. Clean up.

1.3 RELATED SECTIONS

- A. Division 2 Section “Earthwork”.
- B. Division 2 Section “Exterior Planting”.

1.4 REFERENCES

- A. The following apply to work in this Section:
 1. Agricultural Chemist: Qualified, experienced public or private soils testing laboratory, capable of providing test results as specified.
 2. ASTM: American Society of Testing Materials.
 3. USDA: United States Department of Agriculture.
 4. AOAC: Association of Official Agricultural Chemists.
 5. SSSA: Soil Science of America, Methods of Soil Analysis.
 6. TMECC: Test Methods for the Examination of Composting and Compost.

1.5 GENERAL DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Topsoil: A native mineral soil taken from the O and A Horizons of a well-drained site and having a USDA soil texture classification as specified herein.
- C. Planting Soil: Imported Topsoil.
- D. Subgrade: Surface or elevation of subsoil remaining after completing excavation or backfill immediately beneath planting soil.
- E. Softscape: Shall include “landscaping” items such as trees, plantings, lawns, mulches, earth, and related soils and other organic and “natural” items.
- F. Hardscape: Shall include all structural and fixed items such as concrete, cut stone, paving and other fabricated items.
- G. Debris: Elements including, but not limited to, concrete, concrete masonry, wood, excavated rock and rock fragments, rubble, overburden soils, abandoned utility structures, trash, refuse and litter.

1.6 SUBMITTALS

A. Qualifications

1. Installation and maintenance foreman on the job shall be experienced in landscape installation and maintenance on projects with similar scope. Perform work with personnel totally familiar with planting soil preparation and lawn and planting installations under the supervision of a foreman experienced with landscape work.
2. Testing Laboratory: Experienced person or persons employed by public or private testing laboratory, qualified and capable of performing tests, making soil recommendations, and issuing reports as specified. The Testing Laboratory shall submit a Statement of Qualifications with regard to the specified testing. The Testing Laboratory shall be as approved by the Owner.
3. Soil Supplier and Installing Contractor shall be experienced in fabrication and installation of soil mixes with similar complexity.

B. Sequencing, Scheduling and Protection Plan

1. Submit a detailed plan for scheduling and sequencing of all soil work including but not limited to rough grading, Planting Soil installation, fine grading, equipment data and settlement/compaction methodology.
2. Coordinate all soils work with Contractors requiring access through the site.
 - a. Indicate with schedules and plans the utilization of planting soil and subsoil protection measures until Substantial Completion.
 - b. Indicate with schedules and plans protection measures (wooden protection boards or other approved methods) over areas where construction operations will traverse installed planting soil.

C. Testing Agency(ies): Provide test data from one of the following testing agencies, or an approved equal.

1. Soil physical analysis on all components and Planting Soil including particle size analysis shall be determined by an A2LA Accredited Lab and soil chemical analysis on all components and Planting Soil can be performed by:
 - a. University of Massachusetts Soil and Plant Tissue Testing Laboratory, West Experiment Station, 682 North Pleasant Street, Amherst, MA 01003, phone 413-545-2311, fax 413-545-1931.
 - b. CLC Labs, 325 Venture Drive, Westerville, OH 43081, phone 614- 888-1663, fax 614-888-1330.
 - c. Hummel & Co, 35 King Street, Trumansburg, NY 14886, phone 607-387-5694, fax 607-387-9499.
 - d. Penn State Agricultural Analytical Services Laboratory, University Park, PA 16802, phone 814-863-0841, fax 814-863-4540.
 - e. Rutgers Agricultural Experiment Station, Soil Testing Laboratory, PO Box 902, Milltown, NJ 08850, phone 732-932-9295.
 - f. Or other qualified laboratory approved by the Landscape Architect.

D. Test Data, Samples, Product Data and Certificates

1. Samples: Submit loose materials in sealed bags labeled with the name of the project title, material, manufacturer/supplier.
 - a. Topsoil, 1 gallon Zip-lock bag.
 - b. Organic Matter, 1 gallon Zip-lock bag.
 - c. Any other soil amendment or conditioner as requested by the Owner. Submit certificates and product data cut sheets for each type of amendment material.

2. Provide written confirmation that the source of supply can meet the quantities required for the scope of work. Multiple sources for a single item are not acceptable.
3. Quality Control Samples: Maintain a 5-gallon bucket of final approved Planting Soil on-site in a protected, secure location. If the installed or delivered Planting Soil deviate from the control samples additional testing will be required at the Contractors expense.
4. All Test Reports must be labeled with the following information. To facilitate proper record keeping, a Contractor Submittal Transmittal is included herein.
 - a. Date material sampled from source/supplier.
 - b. Date material tested in lab.
 - c. Project title.
 - d. Name of contractor.
 - e. Name of source/supplier and material tested.
 - f. Testing agency name and contact information.
 - g. Test type and test result including units reported.
 - h. Results of test including deviations from acceptable ranges as defined by the specifications. If not defined by the specifications then as recommended by the testing agency.
 - i. Test reports must be submitted with sample of the material tested.
5. Test Reports: Submit this specification and sample intended for use for planting soil to the approved Testing Agency. All reports must be submitted with representative samples. Materials criteria as defined in 1.7 Soil Testing Definitions and Part 2 – Products, herein.
 - a. Topsoil
 1. pH and Buffer pH
 2. Particle Size Analysis
 3. Sand Sieve Analysis
 4. Organic Matter Content
 5. Nutrient Analysis
 6. Soluble Salt Content
 7. Cation Exchange Capacity (CEC)
 8. Carbon to Nitrogen Ratio (C:N)
 9. Material Drainage Rate
 - b. Organic Matter
 1. pH
 2. Particle Size Analysis
 3. Organic Matter Content
 4. Nutrient Analysis
 5. Soluble Salt Content
 6. Cation Exchange Capacity (CEC)
 7. Carbon to Nitrogen Ratio (C:N)

1.7 SOIL TESTING DEFINITIONS

- A. Particle Size Analysis: shall be performed and compared to the USDA Soil Classification System per ASTM D422 (hydrometer test) and USDA sand and gravel classifications shall be determined on material retained on the #270 sieve following a wet washing procedure. Test data shall clearly indicate results in percent passing and percent retained.
- B. Sand Sieve Analysis:

<u>USDA Designation</u>	<u>Size (in mm)</u>
Gravel	+2

Very Coarse Sand	1 – 2
Coarse Sand	0.5 – 1
Medium Sand	0.25 – 0.5
Fine Sand	0.1 – 0.25
Very Fine Sand	0.05 – 0.1
Silt	0.002 – 0.05
Clay	<0.002

All soil mixes shall be tested for particle size and organic content after passing through a 1/4-inch sieve rather than the standard 2-mm sieve to include larger pieces of organic material.

- C. Material Drainage Rate: shall be reported in inches per hour at 80% to 85% dry density. Provide water permeability analysis per ASTM F1815-97 using standard Proctor method, ASTM D698. Include the bulk density in Mg/m³ for each sample tested.
- D. Soluble Salt Content: shall be determined by electrical conductivity of a 1:2 soil/water sample reported in millimhos per cm.
- E. Organic Matter Content: shall be as determined by ASTM F1647-02a, loss-on-ignition, oven-dry weight.
- F. Nutrient Analysis: Test results shall be cited in parts per million.

<u>Macro-Nutrients</u>	<u>Approximate Target Levels (ppm)</u>
Nitrate Nitrogen (NO ₃)	5 to 15
Phosphorus (P)	30 to 50
Potassium (K)	120 to 510
Calcium (Ca)	700 to 1300
Magnesium (Mg)	140 to 270
Sulfur (S)	10 to 75

<u>Micro-Nutrients</u>	<u>Approximate Target Levels (ppm)</u>
Boron (B)	0.5 to 2.0
Chlorine (Cl)	>1.0
Cobalt (Co)	--
Copper (Cu)	>0.6
Iron (Fe)	>4.5
Manganese (Mn)	>1.5
Molybdenum (Mo)	--
Nickel (Ni)	<30
Zinc (Zn)	>1.0

Nutrient test shall include testing laboratory recommendations for supplemental additions to the soil mix for the plants specified. Testing lab shall also provide notice when chemicals are in excessive levels and are toxic to plants, humans or animals.

- G. Cation Exchange Capacity (CEC): shall be determined using the pH 7 ammonium acetate method.

1.8 PROJECT CONDITIONS

A. Environmental Requirements for Soil:

1. Perform both on-site soil work only during suitable weather conditions. Do not disc, roto-till, or work soil when frozen, excessively wet or muddy, or in otherwise unsatisfactory condition.
2. Planting Soil shall not be handled, hauled or placed during rain or wet weather where over-compaction will occur.

1.9 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Planting Soil or organic amendment materials shall be protected from intrusion of contaminants and erosion at all times. Once mixed, cover the final stockpile with filter cloth or store in a covered space.
- B. Stockpiling: On-site stockpiling shall be restricted to no more than the needs of what can be used in a 24 hour period, unless approved otherwise by the Landscape Architect. Stockpiles should be no more than 6 feet in height to prevent anaerobic conditions within the pile(s). Composts should be turned weekly.
- C. Deliver packaged materials to the location where soils are to be mixed, in unopened bags or containers, each bearing the name, guarantee, and trademark or the producer, material composition, manufacturer's certified analysis, and the weight or the material. Retain packages for review by the Landscape Architect.
- D. Store and handle packaged materials in compliance with manufacturer's instructions and recommendations. Protect all materials from weather, damage, and theft.

PART 2 – PRODUCTS

2.1. TOPSOIL

- A. A natural, loamy, friable mineral soil taken from the O and A Horizons essentially free from heavy or stiff clay lumps, stones, cinders, concrete, brick, roots, sticks brush, litter, plastics, metals, refuse or other deleterious materials in accordance with ASTM D 5286-92. The soil shall be free of herbicides, petroleum-based materials or other substances of a hazardous or toxic nature, which may inhibit plant growth. The soil shall be free of noxious weeds, seeds or vegetative parts of weedy plants that cannot be selectively controlled in the planting.
- B. The soil shall have a USDA soil texture classification of Sandy Loam. Deviations including Loam, Clay Loam, and Sandy Clay Loam may be acceptable as determined by the Landscape Architect contingent on test result data including, but not limited to, Particle Size Analysis and Sand Sieve Analysis. If available, coarse-grained topsoil is preferred. Unacceptable topsoil includes soils that contain more than 25% clay or 30% silt or less than 45% sand. Clay content shall be between 10% and 25% by volume. Sand content shall fall between 45% and 60% by volume.
- C. The topsoil component shall meet the following specifications. Perform the following tests and submit test reports showing the following criteria are met:
 - 1. Particle size analysis as defined above.
 - 2. Sand sieve analysis as defined above.
 - 3. pH shall fall between 5.5 to 7.0 and Buffer pH shall fall between 6.8 to 7.0.
 - 4. Soluble salts shall be less than 2.0 millimhos per cm.
 - 5. Organic content shall fall between 4.0 to 6.0%.
 - 6. CEC shall be a minimum of 12 Meq/100g.
 - 7. Carbon to nitrogen (C:N) ratio shall be between 10:1 and 20:1.
 - 7. Material drainage rate shall be between 1.5 and 2.5 inches per hour +/- 0.5.
 - 8. Nutrient analysis shall conform to Article 1.7 herein. The testing agency shall provide acceptable ranges for each nutrient with the nutrient analysis.

2.2 ORGANIC AMENDMENT / COMPOST

- A. All compost testing shall be done in conformance with the U.S. Compost Council's publication Test Methods for the Examination of Composting and Compost (TMECC) unless otherwise specified above.
- B. The organic amendment shall be stable, mature aerobically composted yard waste. Yard waste will be used to till into the top layer of soil on-site as specified herein. Woodchip bulked bio-

solids, sewage sludge, peat, peat-humus and mushroom compost products are not acceptable. Material must be composted for a minimum of two (2) years unless approved otherwise by the Landscape Architect. The compost material must meet the following characteristics:

1. The compost shall be a homogeneous material essentially free of soil clods, lumps, roots and stones. Should be a black to dark brown color with few identifiable parts.
2. The compost shall have a man-made foreign material (hard plastics, metal, glass, etc.) content less than 1.5% as material retained on a U.S. Std. No.5 (4 mm) sieve (TMECC 03.06).
3. The compost shall be screened such that a minimum of 90% passes a U.S. Std. 3/4" sieve and that no more than 10% passes a U.S. Std. No.10 sieve on a dry weight basis.
4. pH shall be between 6.5 and 7.5.
5. Soluble salts content shall be less than 2.0 millimhos per cm.
6. Organic content shall fall between 35% and 90%.
7. Carbon to nitrogen (C:N) ratio shall be less than 30:1. Optimum ratio is less than 15:1.
8. Nutrient analysis shall conform to Article 1.7 herein. The testing agency shall provide acceptable ranges for each nutrient with the nutrient analysis.

2.3 SOIL AMENDMENTS

A. In-Situ Amendment

1. Spread 3 to 4 inches of approved composted Yard Waste over graded Planting Soil on-site in locations specified per the Drawings.
2. Till Leaf Compost or composted Yard Waste into the top 3 to 4 inches of Planting Soil Mix. Work into soil to achieve a relatively uniform distribution. Avoid extreme cultivation that will break down the soil structure into fine particles.
3. Soil materials shall be maintained moist, not wet, during mixing.
4. Fine grade Planting Soil as specified in Part 3 herein.

B. Additional Amendments: Use only if directed by Landscape Architect.

1. Limestone: Ground, high magnesium limestone containing not less than 85% total carbonates, 95% passing a 20 mesh sieve, 40% passing a 60 mesh sieve and a minimum of 30% percent passing a 100 mesh sieve.
2. Humic Acid: "Dry FeedBack" as manufacturer by Wilma Earth Restoration, 75 Doggett Street, New Haven, CT 06519, or approved equal.

PART 3 – EXECUTION

3.1 VERIFICATION

- A. Prior to construction and soil placement operations at planting areas ascertain the location of all electric cables conduits under drainage systems and utility lines. Take proper precaution to protect sub-grade elements from disturbance or damage. Contractor failing to take these precautions shall be responsible for making requisite repairs to damaged utilities at Contractor's own expense. Verify that required underground utilities are available, located, and ready for use. Coordinate with other trades.
- B. Verify that all work requiring access through or adjacent to areas where Planting Soil is to be placed has been completed and no further access will be required. In the event that access will be required, this must be coordinated with the Contractor.
- C. Any soils polluted by gasoline, oil, mortar and grout debris, construction debris, unacceptable soils, or other substances which would render the soils unsuitable for a proper plant growth shall be removed from the premises whether or not such pollution occurs or exists prior to or during the Contract period. In the event that such material is placed, this material shall be

removed and replaced with approved material. All remedial operations associated with soil mixes shall be reviewed and approved by the Landscape Architect.

3.2 EQUIPMENT

- A. Utilize low-impact machines only. All equipment shall be rated for a ground pressure of 4 psi or lower. Equipment with track belts is preferred.

3.3 SITE PROTECTION

- A. Protect adjacent existing and finished construction from damage or staining by the subgrade soil and Planting Soil. Use ½” plywood and or plastic sheeting as directed to cover existing concrete, metal and masonry work and other items as directed during the progress of the work.
 - 1. Clean up all trash and any soil or dirt spilled on any paved surface at the end of each working day.
 - 2. Protect permeable paving aggregate base and finished unit paving from silt and sediment. Should soil installation work render any part of the permeable unit paving system clogged the unit paving Contractor shall repair the system at the soil Contractors expense.
- B. Maintain all silt and sediment control devices required by applicable regulations.
- C. Provide adequate methods to assure that trucks and other equipment do no track soil from the site onto adjacent property and the public right of way.

3.4 PREPARATION OF SUBGRADE

- A. Make thorough evaluation of the subgrade to ensure water infiltration and drainage, particularly in areas that are not receiving a subsurface drainage system. If drainage is impeded or excessively slow alert the Landscape Architect immediately for corrective measures. Do not proceed with work until remedial action as be determined and implemented.
- B. Do not grade subgrade soil when muddy or excessively wet or frozen. Only work soil when friable. Adhere to environmental requirements as specified herein.
- C. Clear the excavation of all construction debris, trash, rubble and any foreign material. In the event that fuels, oils, concrete washout silts or other material harmful to plants have been spilled into the subgrade material, excavate the soil sufficiently to remove the harmful material. Fill any over excavation with approved fill and compact to the required subgrade compaction.
- D. Subgrade shall be rough graded as required. Once rough grading has been completed, the subgrade shall be loosened by dragging the teeth of a backhoe bucket through the subgrade to a depth of 6 to 8 inches to mitigate compaction created during grading.
- E. Confirm that the subgrade is at the proper elevation and prepared as required. Subgrade elevations shall slope parallel to the finished grade and or toward the subsurface drain lines as shown on the drawings. Subsurface drains lines, if applicable, shall be installed prior to the installation of the Planting Soil.
- F. Request subgrade review by Landscape Architect prior to placing Planting Soil. Clean up subgrade and dispose of all debris prior to review. Planting Soil installation should proceed immediately following subgrade preparation.

3.5 PREPARATION FOR PLANTING SOIL

- A. Do not proceed with the installation of the Planting Soil until all proposed construction in the area have been installed. For site elements dependent on Planting Soil for foundation support, postpone installation until immediately after the installation of Planting Soil. Excavate area adjacent to walks and structures with care so not to undermine the supporting structure.

3.6 PLACING PLANTING SOIL

- A. Do not place, spread or grade Planting Soil when muddy or excessively wet or frozen. Only work soil when friable. Adhere to environmental requirements as specified herein.
- B. Placing, spreading and compacting of Planting Soil may be done using one the following methods.

1. Place the Planting Soil over approved subgrade in 12 to 18 inch lifts. Complete one (1) to three (3) passes with a static/drum roller or plate compactor to lightly compact soil to mitigate excessive compaction. Use of vibratory machines is prohibited, as they will create greater compaction levels than specified herein. Minimize driving over the same areas of previously installed lifts of Planting Soil to the greatest extent possible to avoid over-compaction. Back-drag areas that have become compacted with the teeth of the loader bucket before placing the next lift of Planting Soil.
 2. Place Planting Soil in bands to full depth over approved subgrade as shown on the drawings. Each band shall be equal to the reach of the loader bucket. Work from the interior areas to outside edges to avoid driving over previously placed soil. Use the bottom of the bucket to lightly compact soil to mitigate excessive settlement.
 3. Utilize both methods described above if a hybrid is best suited for Project conditions.
 4. Planting Soil compaction shall not exceed 80% standard Proctor density. Soil compaction becomes rooting limiting above 80% Proctor density. In-situ density testing on installed Planting Soil may be requested if deemed necessary by the Landscape Architect at the Contractors expense if over-compaction is suspected.
 5. At the Contractor's discretion, a mockup of soil spreading and compaction may be done to test methodology for review and coordination with the Landscape Architect and Owner. Compaction testing can be done at this time to verify methodology falls within an acceptable range. Compaction can be lab tested using a Proctor test. A Penetrometer may be used to field test and benchmark soil installation. The mockup may become part of finished work.
- C. Final finished grade elevation should be greater than the depth required per the Drawings to allow for initial settlement. Taper additional soil volume as required to meet structures including, but not limited to, walls, paving, and curbs. Coordinate with the Landscape Architect to determine estimated settlement based on final approved Planting Soil and installation methodology in accordance with the following guidelines:
1. Lawn with high sand and low organic amendment soil: almost no settlement.
 2. Lawn with loamy sand soil: < 1/2 inch per foot of installed soil depth.
 3. Sandy loam soil: 1/2 inch per foot of installed soil depth.
 4. Sandy clay loam soil: 1 to 1-1/2 inch per foot of installed soil depth.
 5. Clay loam soil and any soil with > 10% by volume of organic amendment: 2 inches or more per foot of installed soil depth.
- D. For lawn areas only, see Division 2 Section "Lawn and Fine Grading" for specific requirements.
- E. Grading Tolerances: Planting areas shall be fine graded within 1-1/2 inches of grades indicated on the Drawings. Tolerances shall be within 1/2-inch of grade when meeting with paved surfaces, curbs, walls, or other structures. Maintain all flat areas and slopes to allow free flow of surface drainage without ponding.
- 3.7 CLEAN UP
- A. Maintain the site in an orderly condition during the progress of work. Promptly remove debris and trash. Leave the site in a neat, orderly condition, broom clean.
 - B. Protect all installed Planting Soil from compaction or contamination. Should either occur, immediately notify the Landscape Architect and Owner.

SOIL SUBMITTAL TRANSMITTAL

Contractor Submittal Transmittal

Please use this Submittal Transmittal cover sheet for each Material Type being submitted for review. Do not submit multiple Material Types using a single Submittal Transmittal. Each Material Type to have an individual Submittal Reference Number.

Project Title: Dickinson Square

Submittal Reference No. _____

Spec Section 029100

Name of Contractor _____

Contractor Contact Info _____

Name of Source or Supplier _____

Name of Testing Agency _____

Contact at Testing Agency _____

Material Type Topsoil Sand Compost Planting Soil

Mark appropriate box to indicate item being submitted for review.

Sample Type Test Report Sample Cut Sheet Certificate

Mark appropriate box to indicate item being submitted for review.

Date Submitted _____

Date Material Sampled from Source or Supplier _____

Date Material Tested in Lab _____

Contractor Stamp:

Comments / Notes:

Signature	Date

END OF SECTION

Project No. 14-18-4745-01
Health Care Center #10 - Interior and Exterior Improvements
029110-9
PLANTING SOIL

Contractor Submittal Transmittal



Please use this Submittal Transmittal cover sheet for each Material Type being submitted for review. Do not submit multiple Material Types using a single Submittal Transmittal. Each Material Type to have an individual Submittal Reference Number.

Project Title: Dickinson Square

Submittal Reference No. _____

Spec Section 029110

Name of Contractor _____

Contractor Contact Info _____

Name of Source or Supplier _____

Name of Testing Agency _____

Contact at Testing Agency _____

Material Type Topsoil Sand Compost Planting Soil
Mark appropriate box to indicate item being submitted for review.

Sample Type Test Report Sample Cut Sheet Certificate
Mark appropriate box to indicate item being submitted for review.

Date Submitted _____

Date Material Sampled from Source or Supplier _____

Date Material Tested in Lab _____

Contractor Stamp:

Comments / Notes:

Signature	Date



SECTION 029300
EXTERIOR PLANTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Plants.
 - 2. Nursery visits and plant selection.
 - 3. Tree stabilization.
- B. Related Sections:
 - 1. Division 2 Section "Planting Soil".

1.3 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.
- C. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.
- D. Finish Grade: Elevation of finished surface of planting soil.
- E. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- F. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- G. Planting Area: Areas to be planted.
- H. Planting Soil: Imported topsoil.
- I. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.
- J. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

- K. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated, including soils.
 - 1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
 - 2. Plant Photographs: Include color photographs in digital format at least 4 by 6-inch of each required species and size of plant material as it will be furnished to the Project. Photographs shall be provided to the Owner prior to scheduling any nursery visits. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 20 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.
- B. Samples for Verification: For each of the following:
 - 1. Mulch: 1-gallon Zip-lock bag of each mulch type required; labeled with composition of materials and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
- C. Qualification Data: For qualified landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.
- D. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
 - 1. Manufacturer's certified analysis of standard products.
 - 2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
- E. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods.
- F. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.
 - 1. Experience: Five (5) years' experience in landscape installation in project of similar complexity in addition to requirements in Division 1 Section "Quality Requirements."
 - 2. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 - 3. Pesticide Applicator: State licensed, commercial.

- B. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.
 - 1. Trees: Measure with branches and trunks in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure main body of tree for height and spread. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
 - 2. Other Plants: Measure with stems, petioles, and foliage in their normal position.
 - C. Tree Tagging and Nursery Visits: Upon approval of Article 1.4.A, herein, Owner with Contractor present will select plant material at nursery. Trees must be field grown and in-the-ground at time of selection. Representative samples for shrubs and herbaceous plants will be observed and selected at the nursery and serve as the basis of review and additional plants delivered to the site. The Contractor shall source specified plants and coordinate nursery visits.
 - 1. Plants shall be selected by the Owner from a nursery supply that is at least three times the quantity specified.
 - 2. Deciduous tree selection shall occur at least one (1) months prior to delivery to site. Smaller caliper trees may be selected or tagged in the fall prior to an anticipated spring planting at no additional cost to the Owner. Caliper size at time of planting shall meet specified size unless otherwise approved by Owner.
 - D. Plant Material Observation: Owner may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Owner retains right to observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
 - 1. Notify Owner of delivery of planting materials seven (7) business days in advance of delivery to site.
 - E. Preinstallation Conference: Conduct conference at Project site.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
 - B. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 - C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide

protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

- D. Handle planting stock by root ball.
- E. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F until planting.
- F. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
 - 1. Set balled stock on ground and cover ball with mulch or other acceptable material.
 - 2. Do not remove container-grown stock from containers before time of planting.
 - 3. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly-wet condition.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.
- B. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:
 - 1. Notify Owner no fewer than seven (7) business days in advance of proposed interruption of each service or utility.
 - 2. Do not proceed with interruption of services or utilities without Owner's written permission.
- C. Planting Restrictions: Plant during the following periods as specified on the Drawings. Coordinate planting periods with maintenance periods to provide required maintenance from date of Planting Completion. Do not work soil when muddy or excessively wet or frozen. See Division 2 Section "Planting Soil" for more detail.
 - 1. Spring Planting: May commence as soon as weather and soil conditions permitted as specified herein.
 - 2. Fall Planting: Shall be completed at least four (4) weeks prior to when first frost is predicted to allow for proper establishment.
- D. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.
- E. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.
 - 1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.8 WARRANTY

- A. Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
 - b. Structural failures including plantings falling or blowing over.
 - c. Faulty performance of tree stabilization.
 - d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 2. Warranty Periods from Date of Planting Completion:
 - a. Trees: Twenty-four (24) months.
 - b. Shrubs, Ground Covers, Perennials, Ornamental Grasses, Bulbs and Other Plants: Twelve (12) months.
 - c. Annuals: Three (3) months.
 3. Include the following remedial actions as a minimum:
 - a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
 - b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
 - c. A limit of one replacement of each plant will be required, except for losses or replacements due to failure to comply with requirements.
 - d. Provide extended warranty for period equal to original warranty period, for replaced plant material upon initial replacement. The warranty shall terminate upon successive replacement.

1.9 MAINTENANCE SERVICE

- A. Initial Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.
1. Maintenance Period: Six (6) months from date of Planting Completion.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

- A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated

when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 1 inch in diameter; or with stem girdling roots will be rejected.
 2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.
- B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Owner, with a proportionate increase in size of roots or balls.
- C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- D. Labeling: Label each plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant as shown on Drawings.
- E. Annuals: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery.

2.2 MULCHES

- A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
1. Type: Double-shredded hardwood or Shredded Leaf Mulch (preferred).
 2. Color: Natural. Pigmented or dyed mulches are not acceptable.

2.3 PESTICIDES

- A. General: Pesticide registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.
- B. Pre-Emergent and Post-Emergent Herbicides (Selective and Non-Selective) shall only be used with written authorization by the Owner.

2.4 TREE STABILIZATION MATERIALS

- A. Stakes and Guys:
1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood free of knots, holes, cross grain, and other defects, at least 2-by-2-inch nominal by length indicated, pointed at one end.

2. Guy Cables: Five-strand, 3/16-inch diameter, galvanized-steel cable.
 - a. Flags: Standard surveyor's plastic flagging tape, white, 6 inches long. Use one (1) per cable in areas that are a pedestrian hazard.
3. Straps: Use of hose will not be permitted. Utilize GCS, Inc., 401 Elm Avenue, North Wales, PA 19454, Treestrap, or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.
 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Owner and replace with new planting soil.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.
- B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Owner's acceptance of layout before excavating or planting. Make minor adjustments as required.
- D. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

3.3 PLANTING AREA ESTABLISHMENT

- A. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.
- B. Before planting, obtain Owner's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 EXCAVATION FOR TREES

- A. Planting Pits and Trenches: Install in accordance with the Drawings. Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. Scarify sides of planting pit smeared or smoothed during excavation.
 - 1. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
 - 2. If area under the plant was initially dug too deep, add soil to raise it to the correct level and tamp the added soil to prevent settling.
 - 3. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
 - 4. Maintain supervision of excavations during working hours.
 - 5. Keep excavations covered or otherwise protected when unattended by Installer's personnel.
- B. Obstructions: Notify Owner if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
- C. Drainage: Notify Owner if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

3.5 TREE AND SHRUB PLANTING

- A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
- B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
- C. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare above adjacent finish grades per Drawings.
 - 1. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
 - 2. Continue backfilling process. Water again after placing and tamping final layer of soil.
- D. Set container-grown stock plumb and in center of planting pit or trench with root flare above adjacent finish grades per Drawings.
 - 1. Carefully remove root ball from container without damaging root ball or plant.
 - 2. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. For large shrubs, when planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
 - 3. Continue backfilling process. Water again after placing and tamping final layer of soil.

- E. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6 TREE AND SHRUB PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.
- B. Prune, thin, and shape trees and shrubs only as directed by Owner.
- C. Do not apply pruning paint to wounds.

3.7 TREE STABILIZATION

- A. Install trunk stabilization only if tree is unstable and as follows:
 1. Upright Staking and Tying: Stake trees of 2- through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation, or depth required for stability, and to extend one-third of trunk height above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
 2. Use two stakes for trees up to 12 feet high and 2-1/2 inches or less in caliper; three stakes for trees less than 14 feet high and up to 4 inches in caliper. Space stakes equally around trees.
 3. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
- B. Tree stabilization must be removed within one (1) year of installation, unless tree remains unstable. During the duration stabilization is installed, the Contractor shall make frequent adjustments and status checks to ensure stabilization is functioning and has not become over-tight. The Contractor shall be responsible for damage or harm to the tree caused by poor staking, maintenance, pre-mature removal, or neglect, except when damage is caused by Owner staff or vandalism.

3.8 GROUND COVER AND HERBACEOUS PLANTING

- A. Set out and space ground cover and herbaceous plants other than trees and shrubs as indicated in even rows with triangular spacing.
- B. Work soil around roots to eliminate air pockets.
- C. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

3.9 PLANTING AREA MULCHING

- A. Mulch backfilled surfaces of planting areas and other areas indicated.
 1. Trees in Lawn Areas: Apply organic mulch ring to thickness indicated, in radius per Drawings around trunks.
 2. Organic Mulch in Plant Bed Areas: Apply thickness indicated of organic mulch over whole surface of planting area, and finish level with adjacent finish grades.

3.10 PLANT MAINTENANCE

- A. Maintain plantings by watering, weeding, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

- B. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.11 PESTICIDE APPLICATION

- A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.
- C. Notification signage must be posted at every entrance in a highly visible location at least five (5) days in advance of application and maintained five (5) business days following application, or as recommended by the manufacturers instructions, whereby it is then removed from the site.
 - 1. Notification Signage shall be brightly colored, laminated and at least 8.5" by 11" format including the following information:
 - a. Date of Notification.
 - b. Date of Application.
 - c. Name of Chemical.
 - d. Reason for Chemical Application.
 - e. Information informing as to the precautions that must be taken including humans and pets.

3.12 CLEANUP AND PROTECTION

- A. Do not allow soil and debris created by turf work onto permeable unit paving areas. Promptly clean up any soil or debris on impervious paving areas, such as concrete sidewalk or roadway paving. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.
- C. After installation and before Planting Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

3.13 DISPOSAL

- A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION

SECTION 079100



PREFORMED JOINT SEALANTS

PART 1 GENERAL

1.1 SCOPE OF WORK

- A. Provide labor, materials, equipment and services, and perform operations required for installation of sealants/site and related work as indicated on the drawings or specified herein.
- B. Work Included: The work of this Section shall include, but not be limited to, the following:
 - 1. Exterior weather joints between similar and dissimilar materials.
 - 2. Exterior horizontal traffic joints.
- C. The words ‘caulking’ and ‘sealant’ shall be considered synonymous on the Contract Documents. It shall be understood that both words define materials for sealing joints or seams watertight.

1.2 QUALITY ASSURANCE

- A. Materials shall conform to the latest edition of reference specifications listed below, specified herein and to applicable codes and requirements of local authorities having jurisdiction. Work and installation shall conform to ASTM C962.
- B. Qualifications: Installer of sealants shall have a minimum of five (5) years of successful experience in the application of the type of materials specified in this section and only skilled workmen shall be used for the work.

1.3 SUBMITTALS

- A. Product Data: Copies of manufacturer’s latest published literature for all materials specified herein shall be submitted before materials are delivered to the site.
- B. Schedule of Sealant Usage: Submit a detailed schedule of all locations of sealant usage. List each sealant material, joint filler(s), color(s) and related data for each location of use.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Materials shall be delivered to the site, in original unopened containers, clearly indicating manufacturer's name, brand name, and other identifying information.
- B. Materials shall be stored in a dry location, off the ground and in such a manner as to prevent freezing, damage and the intrusion of foreign matter.
- C. Materials which have become damaged or otherwise unfit for use during delivery, or storage, shall be replaced at the expense of the Contractor.

1.5 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealers under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturers.
 - 2. When joint substrates are wet due to rain, frost, condensation, or other causes.
- B. Joint Width Conditions: Do not proceed with installation of joint sealers where joint widths are less than allowed by the joint sealant manufacturer for the application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealers until contaminants capable of interfering with their adhesion are removed from joint substrates.
- D. Joint Design: Joint widths indicated within the Contract Documents are detailed at their "Designed Width", which is when the joint would be at the average air temperature of 70 degrees F. Installation shall take into account the ambient temperature range at the time of respective installation and operation.
 - 1. Joint materials shall perform over an ambient air temperature range of 120 degrees F. and a surface temperature range of 180 degrees F.

1.6 WARRANTY

- A. The Contractor shall execute and deliver to the Owner before final payment is made, a written warranty in a satisfactory form, stating that labor and materials furnished, and work performed by the Contractor are in accordance with the Contract Documents and authorized alterations and additions thereto; and that, should any defects develop during the warranty period, the Contractor shall upon written notice from the Architect or

Owner, replace or satisfactorily repair such defects, including adjustments to adjacent work, as required; at the convenience of, and without expense to the Owner. Contractor shall warranty work for Five (5) years from date of final acceptance.

PART 2 PRODUCTS

2.1 SEALANT MATERIALS

A. General: Provide a complete system of cleaners, primers, fillers, tapes, backer rods and tapes and sealants in accordance with the manufacturer's requirements and the standards specified herein.

1. Color of Sealants: For concealed joints provide manufacturer's standard color which has the best overall performance qualities for the application shown. For exposed joints the Architect will select colors from the manufacturer's standard colors or special colors as specified elsewhere.

B. Elastomeric Compounds

1. Multi-Component Polyurethane (Sealant Type 1): ASTM C920, class and use as best suited for the intended purpose. Products meeting these requirements are:

a. "Dymeric" by Tremco.

b. "Dynatrol II by Pecora Corp.

c. "Sonolastic NP II" by Sonneborn Building Products.

2. Self-Leveling Traffic Bearing (Sealant Type 2): ASTM C920, self-leveling, two-part polyurethane compound, with a Shore A cured hardness of 35 plus or minus 5, Sealant shall have a joint movement capability of plus/minus 50 percent.

a. "Sonolastic 2C SL" by Sonneborn Building Products

b. "Sikaflex 12SL" by Sika Corp.

c. "Urexpan NR-20 1' by Pecora Corp.

2.2 JOINT FILLER MATERIALS

A. Compressible Rod (Filler Type 1): Types as shown, or as required for proper performance of the sealant in the specific joint, which is compatible with sealant, as recommended by sealant manufacturer. One of the following:

1. Closed Cell Polyethylene Foam Rod: One of the following:
 - a. “Tremco Joint Backing” (Tremco).
 - b. “Green-Rod Polyethylene Backer Rod” (Nomaco, Inc.).
 - c. “HBR Backer Rod” (Hercules, Inc.).
 - d. “Sonofoam Back Rod” (Sonneborn Building Products).
 2. Open Cell Polyurethane Rod: “Denver Foam” as distributed by Pecora Chemical Corp. or Woodmont Products Inc.
- B. Preformed Sponge Rubber or Cork (Filler Type 2): ASTM D1752, Type I, II or III; type best suited for joint condition.
- C. Closed Cell Neoprene (Filler Type 3): ASTM D1056, Type S, Class SCE.
- D. Closed Cell Polyethylene (Filler Type 5): Not less than 3 psi for 25% compression resistance, highly resistant to petroleum oils and solvents, one of the following:
1. “Expand-O-Foam” (Williams Products, Inc.).
 2. “Filler Foam Gasket FF4” (Progress Unlimited Inc.)
 3. “Tremco Joint Backing” (Tremco)
- E. Select shape and size of joint filler in consultation with the manufacturer for proper performance in the specific condition of use in each case.

2.3 MISCELLANEOUS MATERIALS

- A. Joint Cleaner: Provide non-staining cleaner recommended by the manufacturer of the sealant for the specific joint surface and condition.
- B. Joint Primer and Sealer: Provide non-staining compounds recommended by the manufacturer of the sealant for the specific joint surface and condition. Primers and cleaners shall not damage applied metal finishes
- C. Bond Breaker Tape: Pressure sensitive polyethylene tape.
- D. Vent Tubes: Vent tubes (weep holes) shall be heat-bendable acrylic tubes.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine conditions at the job site where work of this section is to be performed to insure proper arrangement and fit of the work. Start of work implies acceptance of job site conditions.

3.2 PREPARATION

- A. Comply with the sealant manufacturers requirements for all preparations.
 - 1. Comply with conditions specified herein before in Paragraph “Project Conditions”.
- B. Clean out joints to receive sealant, backup material or preformed joint filler to comply with recommendations of approved manufacturer and as specified herein.
 - 1. Thoroughly clean joints, removing foreign matter such as dust, oil, grease, water, surface dirt and frost. Sealant must be applied to the base surface. Previously applied paint, film sealers, or coatings shall be entirely removed unless tested and approved by the sealant manufacturer for adhesion.
 - 2. Porous materials such as concrete and masonry shall be cleaned where necessary by grinding, water blast-cleaning, mechanical abrading, or combination of these methods as required to provide a clean, sound base surface for sealant adhesion.
 - a. Clean masonry surfaces with water and air; do not use any acid or other material which might stain surfaces.
 - b. Remove laitance and form release agents from concrete.
 - c. Remove loose particles present or resulting from grinding, abrading or blast-cleaning by blowing out joints with compressed air, oil free, or vacuuming joints prior to application of primer or sealant.
 - 3. Clean and remove protective coatings on metallic surfaces as recommended by sealant manufacturer. Clean joint areas protected with masking tape or strippable films as above after removal of tape film.

3.3 INSTALLATION

- A. Comply with the sealant manufacturers requirements for all preparations.

1. Comply with conditions specified herein before in Paragraph “Project Conditions”
 2. Do not begin sealant operations if the work does not in comply with Contract Documents and the sealant manufacturer’s recommendations.
- B. Joint Fillers: Install joint fillers beneath all sealants.
1. Perform work in strict accordance with manufacturer’s instructions.
 2. Employ mechanics skilled in this trade and proficient in the installation of specified sealant materials.
 3. Install joint filler materials when temperature is between 25 degrees F and 95 degrees F.
 4. For facade and traffic bearing conditions, foam sealant shall be at compression of 25 percent of uncompressed dimension. Depth of joint seal shall be in accordance with manufacturer’s requirements. Prior to installation, size of joint and sizing of seal shall be reviewed having regard to ambient temperature and expected thermal movement.
- C. Sealants
1. Prime joint substrates where recommended by joint sealer manufacturer based upon the completion of a preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer’s recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces or exposed surfaces.
 2. Use masking tape or other materials to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove as soon as possible after tooling sealant without disturbing joint seal.
 3. In joints where depth of joint exceeds required depth of sealant, install joint backing (after primer is dry) in joints to provide backing and proper joint shape for sealant. Proper shape for sealant is a very slight concave curvature. Use special blunt T-shaped tool or roller to install joint backing to the proper and uniform depth required for the sealant. Joint backing shall be installed with approximately 30 percent compression. Do not stretch, twist, braid, puncture, or tear joint backing: Butt joint backing at intersections.

4. Install bond breaker smoothly over surfaces that would bond to sealant and at back of joints where joint backing is not required, so that sealant adheres only to the sides of the joint and not back surfaces or backing.
5. It is recommended that sealant be installed when the average daily air temperature is 70 degrees F (plus/minus 5 degrees F), when joint should be at its Designed Width. When average daily temperature is lower or higher than this range Contractor shall perform work in strict accordance with sealant manufacturer's recommendations.
6. Apply sealant in accordance with the manufacturer's application manual and manufacturer's instructions, using hand guns or pressure equipment, on clean, dry, properly prepared substrates. Sealant application shall be such to ensure complete contact and adhesion to sides of joints. Temperature of sealant, as well as of substrates, at time of sealant application, shall be as recommended by sealant manufacturers. Refer to Paragraph "Job Conditions". Force sealant into joint in front of the tip of the "caulking gun" (not pulled over it) and force sealant against sides to make uniform contact with sides of joint and to prevent entrapped air or pulling of sealant off of sides. Fill sealant space solid with sealant.
7. Tool exposed joints to form smooth and uniform beds, with slightly concave surface. Finished joints shall be straight, uniform, smooth and neatly finished. Remove masking tape immediately after tooling of sealant and before sealant face starts to "skin" over. Neatly remove any excess sealant from adjacent surfaces of joint, leaving the work in a neat, clean condition.

3.4 LOCATIONS OF USE

- A. Sealants: Provide sealants in accordance with the following locations of use:
 1. Provide Sealant (Type 1) for all exterior weather seals and movement joints.
 2. Provide Sealant (Type 2) for all exterior paving joints.
- B. Joint Filler Materials: Provide joint fillers or tapes at all locations of sealant use as follows:
 1. Provide backer rods (Filler Type 1) at all joints to be sealed.
 2. Provide backer rods and joint fillers behind all horizontal joints and horizontal lengths of joints.
 3. Provide bond breaker tape at all joints indicated on the Drawings to have no backer rod and at joints as required by the sealant manufacturer.

3.5 FIELD QUALITY CONTROL

- A. Work under this section shall be subject to detailed inspection. Any sealants found out of plumb or cracking or backer rod or joint fillers found out of plumb or displaced by caulking operations or any work otherwise defective, or work not in accordance with specifications and details, shall be taken out and replaced to the complete satisfaction of the Architect, at no additional cost to the Owner.

3.6 CLEANING AND PROTECTION

- A. Upon completion of the work, unused materials, containers, equipment, masking tape or protective measures, etc., shall be removed from the site. Floors, walls and other adjacent surfaces, that are stained or damaged by work of this section, shall be repaired and adjacent surfaces shall be left in a clean and undamaged condition.
- B. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

END OF SECTION



SECTION 090130

TILE RESTORATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Cleaning and Restoration of Ceramic Tile.
 - 2. Cleaning and Restoration of Porcelain Tile.
- B. Related Requirements:
 - 1. Section 079200 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.

1.3 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile and installation/maintenance standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108.02 A118.3 A138.1, which are contained in its "Specifications for Ceramic Tile, Chemical Resistance and Testing."
- C. Most kiln-fired type tiles made from clay or a mixture of clay and other materials are considered to be a part of the larger classification called "Ceramic Tiles", which are typically split into two groups: porcelain tiles and non-porcelain tiles or glazed clay tiles. Non-porcelain tiles are frequently referred to as ceramic tiles by themselves, separate from porcelain tiles. Porcelain unglazed tiles provide similar waterproofing quality as glazed tile without showing the wear because their color extends throughout the tile.

1.4 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: To be programmed in the construction schedule, and held at project's address noted in the construction documents.

1.5 ACTION SUBMITTALS

- A. Product Data: Submit for each type of product.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Submit for Installer.
- B. Product Certificates: Submit for each type of product.
- C. Product Test Reports: Submit for each type of product to meet standard tests identified in the specified products.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Grout joint stripper and sealer

1.8 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installer has a 7 years minimum of maintenance of masonry, cement and ceramic materials.
 - 2. Installer's supervisor for Project holds masonry, cement and ceramic maintenance and cleaning Certification.
 - 3. Installer employs trained commercial flooring maintenance laborers.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in Division and Division 1.
- B. Store liquid materials in unopened containers and protected from freezing.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with the work until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for tile cleaning and restoration products: Obtain cleaning, stripping and sealing product from the same manufacturer to guarantee product compatibility and warranty
 - 1. Obtain each type of product from same production run and of consistent quality and physical properties the entire application.

2.2 TILE CLEANING AND RESTORATION PRODUCTS

- A. STONETECH Restore Acidic Cleaner: a heavy duty acidic cleaner that renews the look of tile and grout.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. LATICRETE International, Inc.
- B. STONETECH® KlenzAll Alkaline Cleaner and Degreaser: Heavy-duty for tough soils and stains on tiles and natural stone.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. LATICRETE International, Inc.
- C. STONETECH® Impregnator Pro® Sealer: solvent based, penetrating sealer that provides advanced stain protection on natural stone, tile, masonry and grout surfaces. It blocks out oil and water based stains by impregnating into the surface without changing the original look or finish. Effective in interior and exterior applications.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. LATICRETE International, Inc.
- D. STONETECH Professional™ Heavy Duty Coating Stripper: A coating stripper specifically formulated to safely break down coatings and epoxy grout haze.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. LATICRETE International, Inc.
- E.
- F. High-Performance Repair Tile Grout (as required to repair damaged tile joints): ANSI A118.7.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ARDEX Americas.
 - b. Bonsal American, an Oldcastle company.
 - c. Bostik, Inc.
2. Polymer Type: **Acrylic resin** in liquid-latex form for addition to prepackaged dry-grout mix.

2.3 MISCELLANEOUS MATERIALS

- A. STONETECH® Revitalizer® Cleaner & Protector (to be used only by owner request in other areas not specified in the construction documents, or when additional cleaning after tile and grout restoration may be necessary to clean soiled surfaces): An all-in-one formula that cleans everyday messes on natural stone and grout, all while reinforcing protection. Its built-in sealer extends sealer life to prevent stains and makes surfaces easier to clean.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. LATICRETE International, Inc.

2.4 MIXING GROUT (Applies only when required to replaced damaged grout joint)

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be cleaned-restored with Restorer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 1. Verify that all products necessary for proceeding with the cleaning and restoration process are on site in the quantity necessary to execute the work without interruption to avoid lapse of application.

2. Verify that required indoor environmental conditions (temperature, moisture, ventilation, etc.) are met for the application of the specified cleaning and restoration products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Fill cracks and holes in grout joints before proceeding with cleaning and application of sealer.
- B. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
- C. On completion of patching grout joints, proceed with the cleaning of all ceramic and porcelain tile surfaces.
 1. Remove grout residue from tile as soon as possible.
 2. Clean and protect metal surfaces and plumbing fixtures from effects of cleaning.

3.3 CLEANING VERTICAL PORCELAIN TILE & GROUT

Cleaning and restoring old ceramic, porcelain tile and grout to like new condition, use an acidic cleaner such as STONETECH Restore Acidic Cleaner.

1. Surface Preparation for STONETECH® Restore™ Acidic Cleaner:
 - a. Read entire label before using.
 - b. Use only as directed.
 - c. Always test in a small inconspicuous area to determine required dilution and results.
 - d. Be sure all surfaces to be cleaned are swept or vacuumed to remove loose debris.
 - e. Heavy duty dilution may darken some surfaces.
 - f. This acid-based cleaner will etch or damage most marble, limestone and travertine surfaces. Will etch or corrode most metal surfaces.
 - g. Avoid skin and eye contact. Wear protective eyewear, gloves, long sleeves, and long pants while handling product.
 - h. Ensure work area is well-ventilated during application and until surface is dry. Keep children and pets out of the area during application and drying.
2. Dilute concentrated cleaner with warm water according to the following mixing chart:

Use	STONETECH® Restore™ Acidic Cleaner	Warm Water	pH
Heavy Duty	1 Part	1 Part	<1
Medium Duty	1 Part	4 Parts	1.2
Light Duty	1 Part	16 Parts	1.4

3. Application of STONETECH® Restore™ Acidic Cleaner:
 - a. Mask off and protect any metals or other surfaces not intended to be treated.
 - b. Apply mixed solution with a clean mop, or towel.
 - c. Agitate with a scrub brush as needed.
 - d. Remove STONETECH Restore Acidic Cleaner using a clean cloth, wet/dry vacuum or damp cloth.
 - e. Rinse area well with clean water and wipe dry.
 - f. Thoroughly rinse all metal surfaces with clean water.
 - g. Clean and rinse equipment with water.
 - h. Reseal cleaned area with a STONETECH sealer

3.4 CLEANING AND RESTORING CERAMIC FLOOR TILE AND GROUT.

- A. For cleaning of grease, oil, dirt, dry soil and soap scum, or extremely soiled tile, clean with KlenzAll heavy duty alkaline cleaner and degreaser:
 1. Mask off and protect any baseboards or adjacent areas to avoid splashing and overspray onto surfaces not intended to be treated.
 2. Sweep or dust mop loose dirt and debris.
 3. Strip off all topical finishes such as waxes and coatings.
 4. Prepare a solution of STONETECH Professional™ KlenzAll™ mixed with warm or hot water as suggested below:
 - a. Medium Duty Usage — Mix 1 part KlenzAll™ to 4 parts of water.
 - b. Heavy Duty Usage — Mix 1 part KlenzAll™ to 2 parts of water.
 5. Apply STONETECH KlenzAll™ using a low-pressure chemical-resistant sprayer, sponge or mop.
 6. Agitate well using a stiff nylon bristle scrub brush, stiff bristle push broom or a weighted floor machine at 130 lbs.-140 lbs., 175 rpm, fitted with a scrub brush attachment.
 7. Rinse well with clean water and mop, sponge or wet vacuum to remove the remaining cleaning solution.
 8. A hard surface extraction wand and portable or truck mounted extraction machine may be used.
 9. Repeat the rinsing and wet vacuum process to insure that all dirt, soil and cleaner residue have been removed.
 10. To remove deep or stubborn oil stains not completely removed by KlenzAll™, let the surface dry and use STONETECH Professional™ Oil Stain Remover.
 - a. Apply a ¼ inch thick coat of Oil Stain Remover to the oil stained area.
 - b. Ensure that Oil Stain Remover covers an area 1” to 2” beyond the stained area for the purpose of containment.
 - c. Allow 2-3 days for the Oil Stain Remover to dry to a powder.
 - d. Sweep and wipe up dried powder and evaluate the stained area for removal.
 - e. Repeat process if needed.
 - f. Remove any remaining Oil Stain Remover using mineral spirits.
- B. For stripping off any existing topical acrylic, urethane, epoxy, heavy wax coatings and epoxy grout haze:
 1. Mask off and protect any baseboards or adjacent areas to avoid splashing and overspray onto surfaces not intended to be treated.
 2. Sweep or dust mop loose dirt and debris.

3. For heavy, hard to remove coatings, use STONETECH Professional™ Heavy Duty Coating Stripper as is.
 4. For softer coatings, dilute Heavy Duty Coating Stripper with clean water up to a 1 to 1 solution.
 5. Apply an even coat using a chemical-resistant paintbrush, roller or deck brush.
 6. Allow stripper to dwell for 20 minutes to 2 hours or as long as needed to soften coating.
 7. Heavy Duty Coating Stripper will remain active for up to 24 hours
 8. Do not allow Heavy Duty Coating Stripper to remain in contact with epoxy grout joints for longer than two hours.
 9. Rinse well with clean water and mop, sponge or wet vacuum to remove the remaining cleaning solution..
 10. Use a neutral cleaner such as STONETECH Stone Tile Cleaner & Revitalizer that is specially formulated for ceramic, porcelain tile & grout to help remove soils that sweeping, dusting, vacuuming or damp mopping leave behind.
- C. Ceramic tiles will be protected with a penetrating sealer, such as STONETECH Impregnator Pro, including the grout lines. This penetrating sealer is an invisible, stain resistant shield that is absorbed into the surface. The cement grout must be sealed to prevent or minimize staining. Allow new installations to cure for 72 hours prior to applying sealer.
1. Application: Read entire label before using. Use only as directed. Always test in a small inconspicuous area with a 24-hour cure time to determine ease of application and desired results. Allow new grout installations to cure for a minimum of 72 hours prior to applying sealer.
 - a. Make sure surface is clean, dry and free of waxes and coatings.
 - b. Surface temperature should be between 50°F and 80°F. Keep children and pets out of the area until surface use resumes or treated surface is dry.
 - c. Ensure area is well-ventilated during application and until the surface is dry. Use a respirator if unsure that area is well-ventilated. A NIOSH-approved respirator with a combination HEPA/organic vapor cartridge is recommended. Follow respirator manufacturer's instructions for use.
 - d. Mask any surfaces not intended to be treated.
 - e. Liberally apply an even coat of STONETECH® Impregnator Pro® Sealer using a paint pad, roller, a brush or a pump-up garden sprayer. **DO NOT USE A POWER SPRAYER.**
 - f. Do not thin before using.
 - g. Allow sealer to penetrate surface for 15–30 minutes; denser stone may require more time for sealer to penetrate. During this time, distribute excess sealer over entire area to ensure even penetration. **DO NOT ALLOW EXCESS SEALER TO DRY ON SURFACE.**
 - h. Thoroughly wipe dry the entire surface with clean absorbent towels.
 - i. A second coat may be needed for more porous surfaces and should be applied one hour after initial application, as directed in steps (e) through (h).
 - j. If excess sealer was not completely wiped off and a residue appears, wipe entire surface with a towel dampened with sealer. Use a white nylon scrubbing pad to loosen residue and follow with white absorbent towel to remove.
 - k. Full cure is achieved after 24–72 hours. Surface use may begin in 6-8 hours. If use of the surface must resume sooner, cover the treated surface with red rosin paper to protect it until full cure is achieved.

1. Rags and equipment that are wet with product may be combustible.
 - 1) Clean up promptly after job is complete.
 - 2) Clean equipment with mineral spirits and allow drying in a well-ventilated area.
 - 3) Allow rags to dry in a well ventilated area out of the reach of children and pets.
 - 4) When dry, dispose of in accordance with local waste disposal regulations.
2. METHOD OF APPLICATION: DO NOT USE A POWER SPRAYER.
 - a. Power sprayers increase exposure hazard.
 - b. Power sprayers also create a significant amount of overspray resulting in wasted product and the need for additional clean-up.
 - c. A pump-up garden sprayer will reduce the potential for overexposure to vapors and produce better results. For small jobs, use a paint pad, roller or brush.
 - d. Trigger spray bottles are not recommended. Trigger sprayers create overspray and may not give a uniform application. Better results will be obtained using a pad, roller or brush.
 - e. For larger jobs, use a pump-up garden sprayer

3.5 ADJUSTING AND CLEANING

- A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
- B. Cleaning: On completion of patching grout joints, clean all ceramic tile surfaces so they are free of foreign matter.
 1. Remove grout residue from tile as soon as possible.
 2. Clean grout smears and hazes from tile according to tile and grout manufacturer's written instructions. Use only specified cleaners after determining that cleaners are safe to use surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.6 PROTECTION

- A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

END OF SECTION

SECTION 093000



TILING

PART 1 GENERAL

SECTION INCLUDES

- A. Tile and Accessories:
 - 1. Ceramic Floor and Wall Tile.
 - 2. Natural Stone.
 - 3. Trim and Accessories.
 - 4. Setting Materials.

REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. ANSI A108.1B - Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar.
 - 2. ANSI A108.4 - Specifications for Ceramic Tile Installed with Organic Adhesives or Water-Cleanable Tile Setting Epoxy Adhesive.
 - 3. ANSI A108.5 - Specifications for Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
 - 4. ANSI A108.9 - Specifications for Ceramic Tile Installed with Modified Epoxy Emulsion Mortar/Grout.
 - 5. ANSI A108.10 - Specifications for Installation of Grout in Tilework.
 - 6. ANSI A18.1 - Standard Specification for Dry-Set Portland Cement Mortar.
 - 7. ANSI A18.4 - Latex-Portland Cement Mortar.
 - 8. ANSI A18.6 - Standard Ceramic Tile Grouts.
 - 9. ANSI A18.7 - Polymer Modified Cement Grouts
 - 10. ANSI A18.8 - Modified Epoxy Emulsion Mortar/Grout.
 - 11. ANSI A18.9 - Test Methods and Specifications for Cementitious Backer Units
 - 12. ANSI A136.1 - Organic Adhesives for Installation of Ceramic Tile.
 - 13. ANSI A137.1 - Specifications for Ceramic Tile.
- B. ASTM International (ASTM):
 - 1. ASTM C 50 - Standard Practice for Sampling, Sample Preparation, Packaging, and Marking of Lime and Limestone Products.
 - 2. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar.
 - 3. ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes.
 - 4. ASTM C 503 - Standard Specification for Marble Dimension Stone.
- C. Tile Council of North America (TCNA): TCA Handbook for Ceramic Tile Installation, 2007.

PERFORMANCE REQUIREMENTS

- A. Static Coefficient of Friction: Tile on walkway surfaces shall be provided with the following values as determined by testing in conformance with ASTM C 1028.
 - 1. Level Surfaces : Minimum of 0.6 (Wet).

2. Step Treads: Minimum of 0.6 (Wet).
3. Ramp Surfaces : Minimum of 0.8 (Wet).

SUBMITTALS

- A. Submit under provisions of Sections 00 and O1.
- B. Product Data: Manufacturer's data sheets on each product to be used , including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
- D. Selection Samples : Color charts illustrating **full** range of colors and patterns.
- E. Selection Samples : Samples of actual tiles for selection.
- F. Samples: Mount tile and apply grout on two plywood panels, illustrating pattern, color variations, and grout joint size variations.
- G. Manufacturer's Certificate:
 1. Certify that products meet or exceed specified requirements.
 2. For each shipment, type and composition of tile provide a Master Grade Certificate signed by the manufacturer and the installer certifying that products meet or exceed the specified requirements of ANSI A137.1.
- H. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum two years' experience.
- B. Single Source Responsibility: Obtain each type and color of tile from a single source. Obtain each type and color of mortar, adhesive and grout from the same source.

DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products **in** manufacturer's unopened packaging until ready for installation.
- B. Protect adhesives and liquid additives from freezing or overheating **in** accordance with manufacturer's instructions.
- C. Store tile and setting materials on elevated platforms, under cover and in a dry location and protect from contamination, dampness, freezing or overheating.

ENVIRONMENTAL REQUIREMENTS

- A. Do not install adhesives in an unventilated environment.

- B. Maintain ambient and substrate temperature of 50 degrees F (10 degrees C) during tiling and for a minimum of 7 days after completion.

EXTRA MATERIALS

- A. Provide for Owner's use a minimum of 2 percent of the primary sizes and colors of tile specified, boxed and clearly labeled.

2 PRODUCTS

MANUFACTURERS

- A. Acceptable Manufacturer: Garden State Tile, 2401 Walnut Street, Philadelphia PA 19103, 215-564-1420, contact Jessica Oggjogg@gstile.com.
- B. Substitutions: Products are listed as "Basis Of Design", not as proprietary.
- C. Requests for substitutions will be considered in accordance with provisions of Section 00 and 01.

TILE

- A. General: Provide tile that complies with ANSI A1 37.1 for types, compositions and other characteristics indicated. Provide tile in the locations and of the types colors and pattern indicated on the Drawings and identified in the Schedule and the end of this Section. Tile shall also be provided in accordance with the following:
1. Factory Blending: For tile exhibiting color variations within the ranges selected under Submittal of samples, blend tile in the factory and package so tile taken from one package shows the same range of colors as those taken from other packages.
 2. Mounting: For factory mounted tile, provide back or edge mounted tile assemblies as standard with the manufacturer , unless otherwise specified.
 3. Factory Applied Temporary Protective Coatings: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by pre-coating with a continuous film of petroleum paraffin wax applied hot. Do not coat unexposed tile surfaces.
 4. Pattern: As indicated on the Drawings.
 5. Trim Units: Matching bullnose, cove/inside finger cove, cove base, shapes in sizes coordinated with field tile.
- B. WALL TILE:
1. USCU7614310 Glossy Finish - Tender Grey Brt. 4"x10" Color Collection
 2. USCU761S4310 Glossy Finish - Tender Grey Brt. 3"x10" Bullnose Color Collection
 3. Grout: HYGG00835V25 Mobe Pearl Vivid Grout, Rapid Curing, by Bostick
- C. FLOOR TILE
- I. Silver Natural Mosaic, Olympia by Alfalux, 2"x2" Mosaic Mesh Mounted on 12"x12" sheet
 2. Grout: HYGG00813V25 Storm Vivid Grout, Rapid Curing, by Bostick.

TRIM AND ACCESSORIES

- A. Stone Thresholds: Provide stone thresholds uniform in color and finish and fabricated as follows:
 - 1. Material:
 - a. Marble, complying with ASTM C 503 for exterior use and with a minimum abrasive hardness of 10 when tested in accordance with ASTM C 241.
 - b. White Carrera - Standard Finish.
 - 2. Color/Finish: As selected from the manufacturers standard range.
 - 3. Size:
 - a. Fabricate 2 inches (50 mm) wide by full width of wall or frame opening; 1/2 inch (12 mm) thick; beveled one long edge with radiused comers on top side; without holes, cracks, or open seams.
 - b. Fabricated in the sizes and profiles indicated.
 - 4. Provide to provide transition between tile surface and adjoining finishes and at the following locations :
 - a. At doorways where tile terminates.
 - b. At open edges of floor tile where adjacent finish is a different height.

SETTING MATERIALS

- A. Organic Adhesive: ANSI A1 36.1, thinset bond type; use Type I in areas subject to prolonged moisture exposure.
- B. Latex-Portland Cement Mortar (Thin Set): ANSI A1 18.4
- C. Crack-resisting additive at thin-set floor: BOD Laticrete 125 Sound and Crack Adhesive.
- D. Polymer modified cement grout (walls): Sanded or unsanded, as specified in ANSI A1 18.7; color as selected.
- E. Epoxy Grout (floors): ANSI A1 18.8, 100 percent solids epoxy grout; color as selected.
- F. Silicone Sealant: Silicone sealant, moisture and mildew resistant type, clear.
- G. Cementitious Backer Board: ANSI A1 18.9; High density , cementitious, glass fiber reinforced with 2 inch (50 mm) wide coated glass fiber tape for joints and comers:

3 EXECUTION

EXAMINATION

- A. Verify that wall surfaces are free of substances which would impair bonding of setting materials, smooth and flat within tolerances specified in ANSI A1 37.1, and are ready to receive tile.
- B. Verify that sub-floor surfaces are dust-free, and free of substances which would impair bonding of setting materials to sub-floor surfaces, and are smooth and flat within tolerances specified in ANSI A137.1.
- C. Verify that concrete sub-floor surfaces are ready for tile installation by testing for

moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

- D. Verify that required floor-mounted utilities are in correct location.

PREPARATION

- A. Protect surrounding work from damage.
- B. Remove any curing compounds or other contaminants. Verify compatibility of existing concrete slab for adhesion of setting materials. Notify DPP Project Coordinator if slab is found to be incompatible.
- C. Vacuum clean surfaces and damp clean.
- D. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- E. Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and comers, cover with skim coat of dry-set mortar to a feather edge.
- F. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

INSTALLATION - GENERAL

- A. Install tile and grout in accordance with applicable requirements of ANSI A108.1 through A108.13, manufacturer's instructions, and TCA Handbook recommendations.
- B. Lay tile to pattern indicated. Arrange pattern so that a full tile or joint is centered on each wall and that no tile less than 1/2 width is used. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form comers and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install thresholds where indicated.
- G. Sound tile after setting. Replace hollow sounding units.
- H. Keep expansion joints free of adhesive or grout. Apply sealant to joints.
- I. Allow tile to set for a minimum of 48 hours prior to grouting.
- J. Grout tile joints. Use standard grout unless otherwise indicated.
- K. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

INSTALLATION - FLOORS-THIN-SET METHODS

- A. Over interior concrete substrates, install in accordance with TCA Handbook Method F1 13, dry-set or latex-portland cement bond coat, with epoxy grout.
- B. Where epoxy bond coat and grout are indicated, install in accordance with TCA Handbook Method F131.

INSTALLATION - WALL TILE

- A. Over cementitious backer units on studs, install in accordance with TCA Handbook Method W244, using membrane at toilet rooms.
- B. Over cementitious backer units install in accordance with TCA Handbook Method W223, organic adhesive.
- C. Over gypsum wallboard on wood or metal studs install in accordance with TCA Handbook Method W243, thin-set with dry-set or latex-portland cement bond coat, unless otherwise indicated.
 - 1. Where mortar bed is indicated, install in accordance with TCA Handbook Method W222, one coat method.
 - 2. Where waterproofing membrane is indicated other than at showers and bathtub walls, install in accordance with TCA Handbook Method W222, one coat method.
- D. Over interior concrete and masonry install in accordance with TCA Handbook Method W202, thin-set with dry-set or latex-portland cement bond coat.
- E. Over wood studs without backer install in accordance with TCA Handbook Method W231, mortar bed, with membrane where indicated.
- F. Over metal studs without backer install in accordance with TCA Handbook Method W241, mortar bed, with membrane where indicated.

CLEANING

- A. Clean tile and grout surfaces.

PROTECTION OF FINISHED WORK

- A. Do not permit traffic over finished floor surface for 72 hours after installation.
- B. Cover floors with kraft paper and protect from dirt and residue from other trades.
- C. Where floor will be exposed for prolonged periods cover with plywood or other durable walkway covering.

END OF SECTION



SECTION 099113

EXTERIOR PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior and exterior painting, including surface preparation for projects.

1.2 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications.

1.3 REFERENCES

- A. Green Seal Standard GS-11; May 20, 1993.
- B. Occupational Safety and Health Act (OSHA) - Safety Standards.
- C. American National Standards Institute (ANSI) - Performance Standards.
- D. Paint Decorating Contractors of America (PDCA) - Application Standard.
- E. National Paint and Coatings Association (NPCA) - Gloss Standard.
- F. American Society for Testing Materials (ASTM) - Testing Methods.
- G. Master Paint Institute (MPI #) - Established paint categories and standards.
- H. Ozone Transmission Commission (OTC) - Established levels of Volatile Organic Compounds.
- I. SCAQMD 1168 - South Coast Air Quality Management District Rule #1168; October 3, 2003.
- J. SSPC (PM1) - Steel Structures Painting Manual, Vol. 1, Good Painting Practice; Society for Protective Coatings; 1993, Third Edition.
- K. SSPC (PM2) - Steel Structures Painting Manual, Vol. 2, Systems and Specifications; Society for Protective Coatings; 1995, Seventh Edition.
- L. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

1.4 DEFINITIONS

- A. Commercial as used in this Section refers to a product well suited for a commercial application.

- B. DFT as used in this Section refers to the Dry Film Thickness of the coating.
- C. Enamel refers to any acrylic or alkyd (oil) base paint which dries leaving an eggshell, pearl, satin, semi-gloss or high gloss enamel finish.
- D. DTM as used in this Section refers to paint that is applied Direct To Metal.
- E. LEED as used in this Section refers to Leadership in Energy and Environmental Design. Products listed meet LEED criteria for environmentally safe interior primers, paints and coatings.
- F. OTC as used in this Section refers to the Ozone Transmission Commission. OTC has established the following VOC levels for the Northeastern United States. Products shall meet the following OTC limits for VOC's.
 - 1. Interior flat paints: 100 grams per liter or less, per gallon.
 - 2. Interior enamels: 150 grams per liter or less, per gallon.
 - 3. Interior stains: 250 grams per liter or less, per gallon.
 - 4. Interior primers: 200 grams per liter or less, per gallon.
 - 5. Rust preventive coatings: 400 grams per liter or less, per gallon.
 - 6. Dry fog coatings: 400 grams per liter or less, per gallon.
 - 7. Floor coatings: 250 grams per liter or less, per gallon.
- G. Premium as used in this Section refers to the best quality product "top of the line".
- H. VOC as used in this Section refers to Volatile Organic Compounds found in primers, paints, sealers and stains. The level of VOCs appears after each product listed in the Schedule in grams per liter (g/L).
- I. Paints are available in a wide range of sheens or glosses, as measured by a gloss meter from a 60 and/or 85 degree angle from vertical, as a percentage of the amount of light that is reflected. The following terms are used to describe the gloss of our products. The list below is provided for general guidance; refer to the technical data sheet for the actual gloss/sheen level for each product.
 - 1. Flat - Less than 5 Percent.
 - 2. Eggshell - 5 - 20 Percent.
 - 3. Satin - 20 - 35 Percent.
 - 4. Semi-Gloss - 30 - 65 Percent.
 - 5. Gloss - Over 65 Percent.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300 - Administrative Requirements.
- B. Coordinate with Section 01300 - Administrative Requirements.
- C. Product Data: Provide a complete list of all products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category.
 - 2. Cross-reference to specified paint system(s) that the product is to be used in; include description of each system.

- D. Samples: Submit three paper samples, 5 inches by 7 inches (127mm x 178mm) in size, illustrating selected colors for each color and system selected with specified coats cascaded.
- E. Manufacturer's Instructions: Indicate special surface preparation procedures.
- F. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.
- B. Installer Qualifications: All products listed in this section are to be applied by a Painting Contractor with a minimum of five years demonstrated experience in surface preparation and field application of the same type and scope as specified.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Mock-up areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Approved mock-up areas will serve as the standard for remaining Work.
 - 4. Refinish mock-up area as required to produce acceptable Work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Disposal:
 - 1. Never pour leftover coating down any sink or drain. Use up material on the job or seal can and store safely for future use.
 - 2. Do not incinerate closed containers.
 - 3. For specific disposal or recycle guidelines, contact the local waste management agency or district. Recycle whenever possible.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 WARRANTY

- A. Inspection of all surfaces to be coated must be done by the manufacturer's representative to insure proper preparation prior to application. All thinners, fillers, primers and finish coatings shall be from the same manufacturer to support a product warranty. Products other than those submitted shall be accompanied by a letter stating its fitness for use and compatibility.

- B. At project closeout, provide to the Owner or owner's representative an executed copy of the Manufacturer's standard form outlining the terms and conditions of and any exclusions to their Limited Warranty against Manufacturing Defect.

1.10 EXTRA MATERIALS

- A. At project closeout, supply the Owner or owner's representative one gallon of each product for touch-up purposes. Cans shall be clearly marked with color name, number and type of paint.
- B. At project closeout, provide the color mixture name and code to the Owner or owner's representative for accurate future color matching.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Benjamin Moore and Co., which is located at: 101 Paragon Dr ; Montvale, NJ 07645; Toll Free Tel: 866-708-9181; Email: info@benjaminmoore.com; Web:www.benjaminmoore.com
- B. Substitutions:
- C. Requests for substitutions will be considered in accordance with provisions of Section 016030 - Product Requirements.

2.2 MATERIALS - GENERAL

- A. Volatile Organic Compound (VOC) Content:
 - 1. Provide coatings that comply with the most stringent requirements specified in the following:
 - 2. 40 CFR 59, Subpart D-National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - 3. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- B. Compatibility: Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.3 MIXING AND TINTING

- A. Except where specifically noted in this section, all paint shall be ready-mixed and pre- tinted. Agitate all paint prior to and during application to ensure uniform color, gloss, and consistency.
- B. Thinner addition shall not exceed manufacturer's printed recommendations. Do not use kerosene or other organic solvents to thin water-based paints.

2.4 EXTERIOR PAINT SYSTEMS

- A. METAL: Misc. Iron, Ornamental Iron, Structural Iron and Steel, Ferrous Metal.
1. Latex Systems:
 2. Gloss Finish
 - a. 1st Coat: Corotech Acrylic Metal Primer V110 (199 g/L), LEED Credit.
 - b. 2nd Coat: Benjamin Moore Ultra Spec EXT Gloss Finish N449 (46 g/L) MPI # 11.
 - c. 3rd Coat: Benjamin Moore Ultra Spec EXT Gloss Finish N449 (46 g/L) MPI # 11.
 3. Semi-Gloss Finish
 - a. 1st Coat: Corotech Acrylic Metal Primer V110 (199 g/L), LEED Credit.
 - b. 2nd Coat: Benjamin Moore Ultra Spec HP D.T.M. Acrylic Semi- Gloss Enamel, HP29 (147 g/L), MPI # 141, X-Green 141, 153, X-Green 153, LEED 2009, LEED V4.
 - c. 3rd Coat: Benjamin Moore Ultra Spec HP D.T.M. Acrylic Semi- Gloss Enamel, HP29 (147 g/L), MPI # 141, X-Green 141, 153, X-Green 153, LEED 2009, LEED V4.
- B. WOOD: Siding, Trim, Shutters, Sashes, Hardboard-Bare/Primed; Boral TruExterior Siding and Trim (as per manufacturer's written installation instructions)
1. Latex Systems:
 - Semi-Gloss Finish:
 - 1st Coat: Benjamin Moore Fresh Start High-Hiding All Purpose Primer 046 (44 g/L), MPI # 6, 17, X-Green 17, 39, 50, X-Green 50, 137, X-Green 137, LEED Credit, CHPS Certified.
 - 2nd Coat: Benjamin Moore Ultra Spec HP D.T.M. Acrylic Semi- Gloss Enamel, HP29 (147 g/L), MPI # 141, X-Green 141, 153, X-Green 153, LEED 2009, LEED V4.
 - 3rd Coat: Benjamin Moore Ultra Spec HP D.T.M. Acrylic Semi- Gloss Enamel, HP29 (147 g/L), MPI # 141, X-Green 141, 153, X-Green 153, LEED 2009, LEED V4.
 - Satin Finish:
 - 1st Coat: Benjamin Moore Fresh Start High-Hiding All Purpose Primer 046 (44 g/L), MPI # 6, 17, X-Green 17, 39, 50, X-Green 50, 137, X-Green 137, LEED Credit, CHPS Certified.
 - 2nd Coat: Benjamin Moore Ultra Spec EXT Satin N448 (46 g/L), MPI # 15.

3rd Coat: Benjamin Moore Ultra Spec EXT Satin N448 (46 g/L), MPI # 15.

Satin Finish - Early Moisture Resistant Finish:

1st Coat: Benjamin Moore Fresh Start High-Hiding All Purpose Primer 046 (44 g/L), MPI # 6, 17, X-Green 17, 39, 50, X-Green 50, 137, X-Green 137, LEED Credit, CHPS Certified.

2nd Coat: Benjamin Moore Regal Select Exterior High-Build Low Lustre N401 (40 g/L), MPI # 15, 315.

3rd Coat: Benjamin Moore Regal Select Exterior High-Build Low Lustre N401 (40 g/L), MPI # 15, 315.

& Siding Stain 640 (93 g/L) MPI # 16.

PART 3 EXECUTION

3.1 Preparation and application will be per Boral TruExterior manufacturer's written instructions.

3.2 EXAMINATION

- A. The Contractor shall review the product manufacturer's special instructions for surface preparation, application, temperature, re-coat times, and product limitations.
- B. The Contractor shall review product health and safety precautions listed by the manufacturer.
- C. The Contractor shall be responsible for enforcing on site health and safety requirements associated with the Work.
- D. Do not begin installation until substrates have been properly prepared.
- E. Ensure that surfaces to receive paint are dry immediately prior to application.
- F. Ensure that moisture-retaining substrates to receive paint have moisture content within tolerances allowed by coating manufacturer. Where exceeding the following values, promptly notify Architect and obtain direction before beginning work.
 - 1. Concrete and Masonry: 3-5 percent. Allow new concrete to cure a minimum of 28 days.
 - 2. Exterior Wood: 17 percent.
 - 3. Interior Wood: 15 percent.
 - 4. Interior Finish Detail Woodwork, Including Trim, and Casework: 10 percent.
 - 5. Plaster and Gypsum: 15 percent.
 - 6. Concrete Slab-On-Grade: Perform calcium chloride test over 24 hour period or other acceptable test to manufacturer. Verify acceptable moisture transmission and pH levels.
- G. Examine surfaces to receive coatings for surface imperfections and contaminants that could impair performance or appearance of coatings, including but not limited to, loose primer, rust, scale, oil, grease, mildew, algae, or fungus, stains or marks, cracks, indentations, or abrasions.

- H. Correct conditions that could impair performance or appearance of coatings in accordance with specified surface preparation procedures before proceeding with coating application.

3.3 PREPARATION - GENERAL

- A. Clean surfaces thoroughly prior to coating application.
- B. Do not start work until surfaces to be finished are in proper condition to produce finished surfaces of uniform, satisfactory appearance.
- C. Stains and Marks: Remove completely, if possible, using materials and methods recommended by coating manufacturer; cover stains and marks which cannot be completely removed with isolating primer or sealer recommended by coating manufacturer to prevent bleed-through.
- D. Remove Mildew, Algae, and Fungus using materials and methods recommended by coating manufacturer.
- E. Remove dust and loose particulate matter from surfaces to receive coatings immediately prior to coating application.
- F. Remove or protect adjacent hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items not indicated to receive coatings.
- G. Move or protect equipment and fixtures adjacent to surfaces indicated to receive coatings to allow application of coatings.
- H. Protect adjacent surfaces not indicated to receive coatings.
- I. Prepare surfaces in accordance with manufacturer's instructions for specified coatings and indicated materials, using only methods and materials recommended by coating manufacturer.

3.4 SURFACE PREPARATION

- A. Wood:
 - 1. Seal knots, pitch streaks, and sap areas with sealer recommended by coating manufacturer; fill nail recesses and cracks with filler recommended by coating manufacturer; sand surfaces smooth.
 - 2. Remove mill marks and ink stamped grade marks.
 - 3. Apply primer coat to back of wood trim and paneling.

3.5 APPLICATION - GENERAL

- A. Application of primers, paints, stains or coatings, by the Contractor, will serve as acceptance that surfaces were properly prepared in accordance with the manufacturer's recommendation.
- B. Apply each coat to uniform coating thickness in accordance with manufacturer's

1. instructions, not exceeding manufacturer's specified maximum spread rate for indicated surface; thins, brush marks, roller marks, orange-peel, or other application imperfections are not permitted.
- C. Allow manufacturer's specified drying time, and ensure correct coating adhesion, for each coat before applying next coat.
 - D. Inspect each coat before applying next coat; touch-up surface imperfections with coating material, feathering, and sanding if required; touch-up areas to achieve flat, uniform surface without surface defects visible from 5 feet (1.5 m).
 - E. Remove dust and other foreign materials from substrate immediately prior to applying each coat.
 - F. Where paint application abuts other materials or other coating color, terminate coating with a clean sharp termination line without coating overlap.
 - G. Where color changes occur between adjoining spaces, through framed openings that are of same color as adjoining surfaces, change color at outside stop corner nearest to face of closed door.
 - H. Re-prepare and re-coat unsatisfactory finishes; refinish entire area to corners or other natural terminations.

3.6 CLEANING

- A. Clean excess coating materials, and coating materials deposited on surfaces not indicated to receive coatings, as construction activities of this section progress; do not allow to dry.
- B. Re-install hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items that have been removed to protect from contact with coatings.
- C. Reconnect equipment adjacent to surfaces indicated to receive coatings.
- D. Relocate to original position equipment and fixtures that have been moved to allow application of coatings.
- E. Remove protective materials.

3.7 PROTECTION AND REPAIR

- A. Protect completed coating applications from damage by subsequent construction activities until completion of painting project.
- B. Touch-up coatings damaged by subsequent construction activities.

END OF SECTION

PROJECT No. 14-18-4745-01
Health Care Center #10 – Interior and Exterior Improvements
099113 - 8

EXTERIOR PAINTING

EXTERIOR PAINTING

SECTION 102113
TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Toilet compartments and doors.
- B. Pilasters, wall mounted pilasters (where applicable).
- C. Hardware, etc.
- D. Shop drawings.

1.02 RELATED SECTIONS

- A. Section 10800 - Toilet Room Accessories.

1.03 REFERENCES

- A. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
- B. ASTM A167 - Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
- C. FS RR-P-1352 - Complete Toilet Partition.
- D. ASTM D 635 - Test for Rate of Burning and or Extent and Time of Burning of Self-Supported Plastics in a Horizontal Position.

1.04 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Shop Drawings: Indicate partition plan and elevation views, dimensions, details of wall supports, in walls steel reinforcements for proper securing of the finish work (required when existing walls are not structurally sounded or appropriate to receive anchors specified herein or whereas indicated on construction drawings) and door swings.
- C. Product Data: Product specified herein under PART 2, item 2.02, to be independently certified in writing by the manufacturer indicating compliance to the appropriate building codes governing the project as it applies to the use of plastic in a Institutional building environment.
- D. Installation Data: Submit manufacturer's documentation on installation instruction and data on panel construction, hardware, continuous wall bracket and accessories to meet specification as outlined.
- E. Warranty: Provide a writing warranty covering the entire Poly-Marble HD plastic component against breakage, corrosion and delaminating for a period of 15 years, under the provision of the Section 01700.
- F. Samples: Provide 12 x 12 inch color samples of panel illustrating panel finish, color and sheen.

1.05 QUALIFICATIONS

- A. Only authorized factory installers will be accepted for the performing of the work of this section.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. All panels, doors and pilasters must arrive at the job site with the special protective plastic covering.
- B. Deliver, store, protect, and handle products under provisions of Section 01600.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Solid Plastic Toilet Compartments:
 - 1. SANTANA PRODUCTS CO., 801 E. Corey St., Scranton, PA. 18505.
 - 2. BRADLEY CORPORATION, 10W142N9101 Fountain Boulevard, Menomonee Falls, WI 53051.
- B. Toilet Compartments Hardware and Accessories:
 - 1. SANTANA PRODUCTS CO., 801 E. Corey St., Scranton, PA. 18505.
 - 2. BRADLEY CORPORATION, 10W142N9101 Fountain Boulevard, Menomonee Falls, WI 53051.
- C. Substitutions: Under provisions of Section 01600.

2.02 MATERIALS

- A. Toilet Compartments: Solid plastic "Poly-Mar HD" 2000 Series, no to exceed a burn rate of 1.29 in accordance with ASTM D 635.
 - 01. *DESCRIPTION:* All panels, doors and pilasters should be fabricated from High Density Polyethylene (HDPE) containing a minimum of 50% recycled material manufactured under high pressure, forming a single component section which is water-proof, non-absorbent and has a self-lubricating surface that resist marking with almost any writing utensils.
 - 02. *CHARACTERISTICS:* The solid plastic material is a dual component compression molded High Density Polyethylene (HDPE) of solid Poly-Marble HD virgin resin materials in colors that extend throughout the surface; it shall have recycled material (HDPE) as the core material. Doors, panels and pilaster shall be a minimum of one inch thick with all edges machined to a radius of 0.250" and all exposed surface to be free of saw-marks and scratches.

2.03 HARDWARE

- A. Door Hardware shall be as follow:
 - 01. *HINGES:* Integral hinge system, which consists of a pilaster and door, both of which are machined out to accept a 2 inch diameter nylon 6/6 pin. A 4 inches sleeve is used in the top portion of the door and pilaster. For maximum flexibility, a similarly designed "cam-action" sleeve for the lower portion of the door is used. This sleeve is 6 inches long, with a $\frac{3}{16}$ inch stainless steel pin, inserted into the lower part of the pilaster to allow for a positive opening and closing action, free of impediment. Door closures can be factory set to accommodate all conditions.
 - 02. *DOOR-STOP:* Out-swinging door against a building's wall to have included a door stop on existing wall.
 - a. IVES Heavy Duty Wall Door Stop #443.
 - 03. *DOOR STRIKE AND KEEPER:* This items shall be fabricated from heavy aluminum extrusion (6364-T5 Alloy) with clear anodized finish with wrap around flange surface mounted and thru-bolted to pilaster with one way sex bolts. Size of the strike shall be 6" in length.
 - 04. *DOOR LATCH HOUSING:* Shall be fabricated from heavy aluminum extrusion (6364-T5 Alloy) with clear anodized finish, surface mounted and thru-bolted to door with one way sex bolts. Slide bolt and bottom shall be heavy aluminum with "Tough-Coat Black" finish.
- B. Continuous clear anodized aluminum wall brackets (Heavy Duty, 6364-T5-Alloy) and panel-pilaster brackets with a thickness no less than $\frac{1}{8}$ ".

- C. Pilaster Shoe: 20 gauge stainless steel base shoe, type 304.

2.04 FABRICATION

- A. Fabricate toilet compartments in the following dimensions arrangements, unless otherwise as indicated on the construction drawings:
 - 01. Dividing panels shall be 55" high and mounted at 14" to 15" above finished floor.
 - 02. Doors shall be 55" high and mounted at 14" to 15" above finished floor.
 - 03. Pilaster shall be 102" high or shorter for floor to ceiling application, mounted within one piece stainless steel shoe with one way theft-proof, stainless steel sex bolts.
 - 04. Finish of doors panels and pilasters shall be similar and equal to SANTANA PRODUCTS INC. "Plastic-Glaze 280." Color of doors, panels and pilasters will be selected from the standard "Poly-Marble HD" color range.
 - 05. Aluminum edging strips (heat-zinc) to be fastened to the bottom edge of all doors and panels using vandal proof stainless steel fasteners.
- B. Unless otherwise indicated, for ordinary toilet compartments with a depth no less than 48 inches, provide 24 inches wide "in-swing" doors with hinges to be factory set to 20 to 30 degrees in open position; and 32 inches wide out-swing door for handicap toilet compartment with hinge to be factory set to 5 to 10 degrees in open position and/or as required by ANSI A117.1 of the American National Standard Institute. When ordinary toilet compartments have a depth shorter than 48 inches, provide 24 inches wide out-swing doors with hinges factory set to a closed position.
- C. Fabricate all components to meet manufacturer's specifications

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that site conditions are ready to receive work.
- B. Verify field opening measurements are as indicated on shop drawings.
- C. Verify correct spacing of plumbing fixtures.
- D. Verify correct location of the existing masonry toilet partition for anchorage.
- E. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

- A. Install pilasters secure, straight, plumb, and level.
- B. Maintain 1 to ½ inch space between wall and panels.
- C. Continuous brackets shall be used for all panel to pilaster, pilaster to wall and panel to wall connections. Wall brackets shall be thru-bolted to panels and pilasters with one way sex bolts.
- D. The attachment of the brackets to the adjacent wall construction shall be accomplished as follow:
 - 01. Use # 14 x 12 inches stainless steel TORX pin head screws anchored directly behind the vertical edge of panels and pilasters at 12 inches intervals, alternately spaced between anchor connections.
 - 02. Wall anchor devices: RAWL 9320 anchors on solid masonry wall; and RAWL Toggle Bolt on hollow masonry wall and framed drywall with a minimum of 2" thick plywood backup.

- 03. Provide 2" plywood backup in wall at locations not available. Recess plywood flush with stud=s face and fasten it to continuous wood blocking behind at both sides. Provide wood blocking bridges between studs. Provide same finish surface as the original but new.
- E. Provide adjustment for floor variations with screws jack through steel saddles integral with pilaster. Conceal floor fastening with pilaster shoes.
- F. Equip each door with an integral door-pilaster hinge and one door latch. A low profile (no larger than 12 inches) wall bumper shall be installed only on all in-swing doors, and on any out-swing doors that open 90 degrees against a wall. Hook-wall bumper is not acceptable.
- G. Install door strike and keeper with door bumper on each pilaster in alignment with door latch.
- H. Hinges should be factory adjusted to locate doors in partial opening position when unlatched. Return out-swings doors to close position.
- I. Pilaster shoes shall be anchored to finished floor with RAWL 9520 and # 14 x 12 inches stainless steel Phillips head.
- J. Erection of partitions, etc., shall be done in accordance with the manufacturer's standard recommendations.

3.03 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding $\frac{3}{16}$ of an inch.

3.04 CLEANING

- A. Remove protecting masking. Finished surfaces shall be clean after installation and left free of imperfections.
- B. No evidence of drilling, cutting or patching shall be visible in the finished work. Field touch-up of scratches or damaged finish will not be permitted.
- C. Replace all damaged materials with new.

END OF SECTION



SECTION 102800
WASHROOM ACCESSORIES

PART 1 GENERAL

SECTION INCLUDES

- A. Washroom accessories as scheduled in this Section and as indicated on the Drawings.

RELATED REQUIREMENTS

- A. Section 061000 - Rough Carpentry, coordination with blocking.
- B. Section 092000 - Plaster and Gypsum Board, coordination with blocking.
- C. Section 093000 - Tiling, coordination with layout and installation.
- D. Section 102113 - Toilet Compartments, coordination with accessories.
- E. Section 102814 - Baby Changing Stations, for baby changing stations.

SUBMITTALS

- A. Product Data: Submit manufacturer's data sheets for each product specified, including the following:
 - 1. Installation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Cleaning and maintenance instructions.
 - 4. Replacement parts information.
- B. Schedule: Submit a toilet accessory schedule, indicating the type and quantity to be installed in each washroom. Use room numbers as indicated on the Drawings.

QUALITY ASSURANCE

- A. Manufacturer: Provide products manufactured by a company with a minimum of 10 years successful experience manufacturing similar products.
- B. Single Source Requirements: To the greatest extent possible provide products from a single manufacturer.
- C. Accessibility Requirements: Comply with requirements applicable in the jurisdiction of the project, including but not limited to ADA and ICC/ANSI A117.1 requirements as applicable.

DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations. Protect from damage.

WARRANTY

- A. Manufacturer's Warranty for Washroom Accessories: Manufacturer's standard 1 year warranty for materials and workmanship.

- B. Manufacturer's Warranty for Electric Hand Dryers: Manufacturer's standard 5 year warranty on parts, except 3 year warranty on motor brushes from date of purchase.

PART 2 PRODUCTS

MANUFACTURER

- A. Basis of Design Products: Based on the quality and performance requirements of the project, specifications are based solely on the products of Bobrick Washroom Equipment, Inc.. www.bobrick.com. Location of manufacturing shall be the United States.
- B. Substitutions: The Architect will consider products of comparable manufacturers as a substitution, pending the contractor's submission of adequate documentation of the substitution in accordance with procedures in Division 1 of the Project Manual.

TOILET ACCESSORY SCHEDULE

- A. Single-User Washroom, Heavy Duty:
 - 1. TA-1: B-3706-50 (\$.25) Ladies' Package Goods
 - 2. TA-2: B-3961 ClassicSeries Recessed Touch Free, Pull-Towel , Universal Roll Paper Towel Dispenser and Waste Receptacle with 3944-134 LinerMate Accessory.
 - 3. TA-3: B-2112 Wall-Mounted Soap Dispenser.
 - 4. TA-4: B-6806 Series Concealed Mounting Grab Bars - 1-1/2 inch diameter - see drawings for quantity and lengths .
 - 5. TA-5: KB-200-00 Baby Changing (mount 27" AFF to bottom of open work surface.
 - 6. TA-6: B-290 Series Angle-Frame Mirror.
 - 7. TA-7: B-3888 ClassicSeries Recessed Multi-Roll Toilet Tissue Dispenser.

PART 3 EXECUTION

INSTALLATION

- A. Install products in strict compliance with manufacturer's written instructions and recommendations, including the following:
 - 1. Verify blocking has been installed properly.
 - 2. Verify location does not interfere with door swings or use of fixtures.
 - 3. Comply with manufacturer's recommendations for backing and proper support.
 - 4. Use fasteners and anchors suitable for substrate and project conditions
 - 5. Install units rigid, straight, plumb , and level, in accordance with manufacturer's installation instructions and approved shop drawings.
 - 6. Conceal evidence of drilling , cutting, and fitting to room finish.
 - 7. Test for proper operation.

CLEANING AND PROTECTION

- A. Clean exposed surfaces using methods acceptable to the manufacturer.
- B. Touch-up, repair or replace damaged products **until** Substantial Completion.

END OF SECTION