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END OF SECTION 000110

SECTION 004114 – CONSTRUCTION BID PROPOSAL

PHILADELPHIA REDEVELOPMENT AUTHORITY

RENOVATIONS TO THE HAPPY HOLLOW RECREATION CENTER
4800 WAYNE AVENUE
PHILADELPHIA, PA 19144

THIS BID FORM IS COMPLETE AND MUST NOT BE SEPARATED. IF ANY SHEET OR SHEETS ARE DETACHED WHEN SUBMITTED AS A BID, THE PHILADELPHIA REDEVELOPMENT AUTHORITY RESERVES THE RIGHT TO REJECT YOUR BID.

_____
FIRM NAME

_____
FIRM ADDRESS

_____ _____
FEDERAL EIN **TOTAL BASE BID**

_____
PHILADELPHIA BUSINESS TAX ID

To the Philadelphia Redevelopment Authority:

I, the undersigned Bidder, hereby propose to furnish all the labor, materials and equipment, perform the whole of the work, and submit to all conditions, as represented, intended and implied, both particularly and generally, by the Plans, Special Specifications, Standard Specifications, Standard Details, Standard Contract Requirements, Form of Agreement, the Ordinance authorizing the work and this bid at the prices herein stated, and agrees that each item bid shall be complete in itself, and the Philadelphia Redevelopment Authority may increase or diminish the amount of work thereunder, or omit the item without invalidating the unit price bid for it or any other item, on the following terms to wit:

A. BID AMOUNT

I will complete the Work in accordance with the Contract Documents for the following Bid Amount as defined in Section 00700, Standard Contract Requirements. (Insert Bid Amount in words as well as figures.)

A.	General Conditions:	$_____
B.	Temporary Protection:	$_____
C.	Demolition:	$_____
D.	Foundations:	$_____
E.	Site Improvements:	$_____
F.	Site Electrical:	$_____
G.	Exterior Enclosure:	$_____
H.	Roofing:	$_____
I.	Interior Construction:	$_____
J.	Finishes:	$_____
K.	Plumbing:	$_____
L.	HVAC:	$_____
M.	Electrical:	$_____
N.	Specialties:	$_____
O.	Total Base Bid:	$_____

P. Allowance 1:

1. Bidders are to include the amount equal to Two Percent (2%) of their base bid amount for payment of Permit and License fees to all regulatory agencies. Refer to Allowances, Section 01210 for more details.

2. Allowance Amount:_____Dollars,$_____

Q. Allowance 2:

1. Bidders are to include an allowance for moving and storage of existing Owner equipment present at start of construction. Storage allowance for duration of construction, and able

to be accessed by the Owner during construction when requested. Refer to Allowances, Section 01210 for more details.

2. Allowance Amount:_____Dollars,$_____

ALTERNATES

Refer to section 012300 – Alternates.

ADD ALTERNATE No. 1 Wayne Avenue Sidewalk

ADD ALTERNATE No. 1 AMOUNT

_____

ADD ALTERNATE No. 2 Basketball Courts

ADD ALTERNATE No. 2 AMOUNT

_____

DEDUCT ALTERNATE No. 3 Computer Lab & Game Room Millwork

DEDUCT ALTERNATE No. 3 AMOUNT

_____

B. COMPLETION

I will substantially complete the Work, ready for final payment, in accordance with the Contract Documents within 365 consecutive calendar days counting from the date stated in the Notice to Proceed.

C. ADDENDA

Bidder must attach Addendum Acknowledgement sheets for all Addenda, if applicable.

EXECUTION OF CONTRACT

This contract consists of the Standard Contract Requirements; the Department's Standard Details and Specifications, as they apply; the Department's General Bidding and Contract Requirements; the Tech-

nical Specifications; the Bid; the Plans with all of the notes thereon (excluding any records or reports of test borings, underground structures, and test piles); any additional exhibits or attachments to any of the foregoing; and any addenda thereto issued by the PRA/City (collectively, the "Contract").

NOTE: ANY CONTRACT THAT IS NOT EXECUTED IN ACCORDANCE WITH THE INSTRUCTIONS PROVIDED BELOW, MAY, IN THE SOLE DISCRETION OF THE PHILADELPHIA REDEVELOPMENT AUTHORITY, BE REJECTED.

SIGNING OF CONTRACT

If Contractor is an INDIVIDUAL or a PARTNERSHIP, date and sign the Contract here, with original signatures, in ink.

This _____day of _____ 2025

_____ _____
(Signature of Owner, Partner) (Type or Print Name and Title)

_____
(Business Name of Bidder)

If Contractor is a CORPORATION, date and sign the Contract here with original signatures, in ink, by (a) President or Vice-President of the corporation AND (b) Secretary, Assistant Secretary, Treasurer or Assistant Treasurer of the corporation; and (c) affix the seal of the corporation. If the Contract is not signed by the President or Vice-President; and Secretary, Assistant Secretary; Treasurer or Assistant Treasurer, attach a duly certified corporate resolution authorizing the person signing in place of such officers to execute this Contract for the corporation.

This _____day of _____ 2025

_____ CORPORATE SEAL
(Corporate or Business Name of Bidder)

_____
(Address, Including Zip Code)

_____
(Telephone Number)

_____ _____
(Signature of President or Vice President) (Signature of Secretary, Asst. Secretary, Treasurer or Assistant Treasurer

_____ _____
(Type or Print Name and Title) (Type or Print Name and Title)

SECTION 012200 – UNIT PRICES

*Unit Prices submitted with this bid will be utilized by the City for **additional work (change orders)** not otherwise specified in this bid due to unforeseen conditions not known at the time of contract award. The City reserves the right to negotiate or otherwise bid additional work items in the event the Unit Prices submitted with this bid are not competitive. Unit Prices shall include all associated costs such as material, delivery, installation, applicable permit fees, taxes, bonds, overhead and/or profit, etc. Unit prices listed below are included in the Total Base Bid and are to be added to the Base Bid and Allowances to formulate the total Base Bid of the appropriate Prime contractor.*

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section identifies Unit Prices and describes the method of pricing the change in quantity of the item of work for which the price is stated. Unit prices may be used to price additions and subtractions to the contract amount.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

B. Referenced Section of Specifications stipulate pertinent requirements for products and methods to achieve the work required for each Unit Price.

1.3 SUBMITTALS

A. Submit completed Schedule of Unit Prices simultaneously with the bid for the project.

1.4 SCHEDULE OF UNIT PRICES

A. Payment for additional work and credit for deductions in work caused by modifications to the Contract, shall be computed in accordance with the following Schedule of Unit Prices, which schedule shall remain in effect until all Work of the Contract has been completed and accepted.

B. The Unit Prices shall be firm lump sums all-inclusive cost of the materials, work, layout, drafting, balancing, testing, tools, sundries, scaffolding, trucking, transportation, cleaning, supervision, overhead, profit, and any and all other costs for each of the items listed.

C. The calculations for determining the number of units of work shall be of actual surface, volume, length, hours or number of individual items listed for the class of work, complete in place and accepted or omitted. No allowance for waste, loss, breakage, damage, or difficulties shall be made.

D. Number of units of work will be determined by Contractor. The City reserves the right to independently verify units of Work.

1.4 UNIT PRICE SCHEDULE

	PRODUCT	UNIT OF MEASURE	UNIT PRICE(S)
1	Concrete pathways, per Landscape drawings	1/SF	
2	Interior/Exterior Brick Repointing	1/SF	
3	Interior Glazed Brick Replacement	1/SF	
4	Interior Plaster Repair	1/SF	
5	Metal Ceiling Replacement (including Cornices)	1/SF	
6	Metal Ceiling Repair	1/SF	
7	Wood Ceiling Replacement	1/SF	
8	Wood Trim Replacement	1/LF	
9	Concrete Sidewalk, per Landscape drawings	1/SF	
10	Concrete Curb, per Landscape drawings	1/LF	
11	Low Voltage Conduit (Exterior)	1/LF	
12	Low Voltage Conduit (Interior)	1/LF	

12	Low Voltage Cabling	1/LF	
13	Furnish and Install Ethernet Port	1/Port	
14	Furnish and Install Duplex Receptacle	1/Receptacle	
15	Prep and paint existing exterior railing	1/LF	
16	Furnish, install PPR Standard 6' Chain-link fence	1/LF	
17	Lawn restoration, topsoil, seeding	1/SF	
18	Clear, grub vegetation	1/SF	
19	Patch or repair roof sheathing, prep for new underlayment, AVB, or roofing as appropriate	1/SF	
20	Replace roof sheathing, prep for new underlayment, AVB, or roofing as appropriate	1/SF	

-END-

SECTION 015800 - PROJECT IDENTIFICATION AND SIGNS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

Requirements include the following which shall be provided by the Contractor for General Construction:

A. Furnish, install and maintain project identification sign.

B. Provide temporary on-site information signs to identify Owner's temporary relocation.

C. Remove signs on completion of construction.

D. Allow no other signs to be displayed without approval of owner.

1.2 RELATED REQUIREMENTS

A. Section 011100 – Summary of Work
B. Section 015000 – Temporary Facilities and Controls
C. Section 0151719 – Environmental Controls

1.3 PROJECT IDENTIFICATION SIGN

A. Two (2) digitally printed signs, not less than 4 feet x 8 feet, with graphic content as shown on sample exhibit (1) on the next page of this section.

B. Erect/Fasten on the site at location shown on drawing or as directed by the owner.

1.4 INFORMATIONAL SIGNS

A. Provide at all public entrances, stairways and temporary gates with digitally printed signs providing information about relocated services, if applicable, or other relevant information as determined by the CPO project team. Each sign to be 3 feet by 3 feet and up to 100 letters, with graphic content as shown on sample exhibit (2) on the next page of this section. Allow for a total of eight [8] signs.

A. Erect/Install at appropriate locations to provide required information. Coordinate location with owner/owner's representative.

1.5 QUALITY ASSURANCE

A. Digital Sign Printer: Professional experience in type of work required.

B. Finishes: Adequate to resist weathering and fading for scheduled construction period.

PART 2 PRODUCTS

2.1 SIGN MATERIALS

A. Structure and framing: May be new or used, wood or metal, in sound condition, structurally adequate to work, and suitable for specified finish.

B. Sign surfaces: Exterior softwood plywood with medium-density overlay, in standard large sizes to minimize joints.

1. Thickness: As required by standards to span framing members (not less than ¾ inch thick), to provide even, smooth surface without knots, waves or buckles.

C. Rough hardware: Galvanized.

D. Paint: Manufacturer's Best Exterior quality as approved by architect.
1. Use exhibit for colors and graphics.

PART 3 EXECUTION

3.1 PROJECT IDENTIFICATION SIGN

A. Sign should be printed/manufactured with style, sizes and colors shown on exhibit attached on page 3 of this section.

3.2 INFORMATION SIGNS

A. Signs should be printed/manufactured in style, sizes and colors as shown in Exhibit 2

B. Install at a height for optimum visibility, on ground-mounted poles or attached to temporary structural surfaces.

3.3 MAINTENANCE

A. Maintain signs, fasteners, and hardware in a neat, clean condition; repair damaged sign if needed.

B. Relocate informational signs as required by progress of work.

3.4 REMOVAL

A. Remove signs, supports, fasteners at completion of project.

END OF SECTION

Sample – Exhibit 1 - PROJECT IDENTIFICATION SIGN

Note for Sample – Construction Sign w/ Render for a Rebuild Program Site –

City of Philadelphia, Capital Program Office and City Council logos are on ALL signs.

Social Media Copy

- For Rebuild project sites include the following copy beneath any grant language, “Follow us @RebuildPHL, or email questions to rebuild@phila.gov”
- For all other projects use the following copy, “Follow us @CPO.PHL, or email questions to cpo@phila.gov”

Names

- All construction signs must include the following positions in the following order;
  - Mayor
  - City Councilmember
  - State Elected Officials
  - Managing Director
  - Capital Program Office Director
  - Client Department Executive

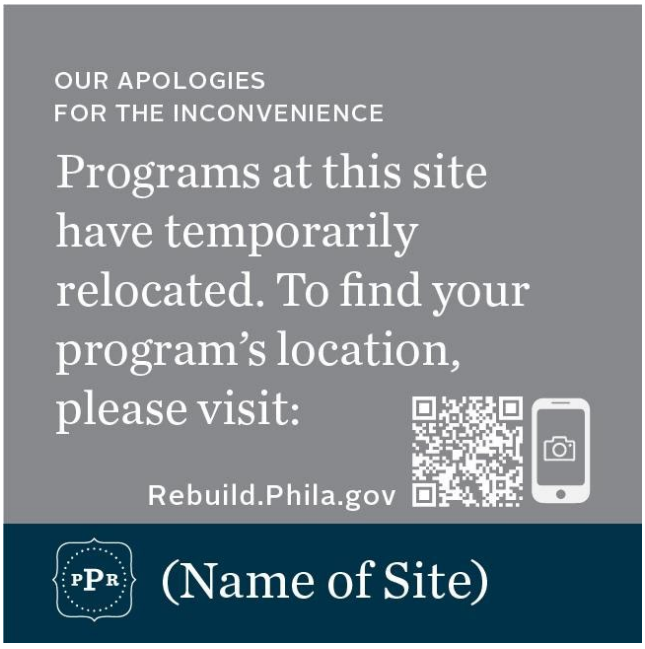
The following logos are dependent on project delivery and owner (see below).

- PPR - only when site is a PPR site.

- FLP - only when site is a FLP site.
- Rebuild – only when site is a Rebuild site.
- William Penn Foundation – only when site is a Rebuild site.
- PPR/FLP - need to show both when a co-located site exists.
- Funders – It may be required for funder logos to be included on the project sign. This will be at the direction of the Capital Program Office.

Note for Sample - Exhibit 1 w/o Render for Rebuild Program Site –

Sample – Exhibit 2 - INFORMATION SIGNS (PPR & FLP)



Note for Sample - Exhibit 2

- PPR Info Sign - QR code to direct to the Rebuild.Phila.gov website
- FLP Info Sign – QR code to direct to the freelibrary.org website

SECTION 040120.64 – MISCELLANEOUS MASONRY REPOINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Repairing brick and stone masonry.
2. Repointing joints with mortar.
3. Cleaning exposed masonry surfaces.

1.2 RELATED SECTIONS:

1. Section 042000 - Miscellaneous Masonry

1.3 DEFINITIONS

A. Rebuilding (Setting) Mortar: Mortar used to set and anchor masonry in a structure, distinct from pointing mortar installed after masonry is set in place.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

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

a. Verify masonry repair specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
b. Materials, material application, sequencing, tolerances, and required clearances.
c. Pre-construction testing requirements.
d. Testing and inspection requirements.
e. Quality-control program.
f. Construction waste management plan.
g. Coordination with building occupants.
h. Coordination with window replacement.
i. Coordination with Owner for existing murals.

1.5 SEQUENCING AND SCHEDULING

A. Order replacement materials at earliest possible date, to avoid delaying completion of the Work.

B. Work Sequence: Perform brick masonry repair work in the following sequence, which includes work specified in this and other Sections:

1. Remove damaged masonry, salvaging any sound face brick for reuse.
2. Rout mortar joints in face brick to a minimum depth of 3/4” or two-times joint width.

3. Repair masonry, including replacing existing masonry with new and/or salvaged masonry materials. Bricks with hairline cracks less than 1/16” wide may remain in place.
4. Install helical wall ties, to anchor new face brick to back-up brick. Space ties in diamond pattern @ 16” oc maximum horizontal spacing, and 16” vertical spacing, and within 4” of cracked bricks, and within 4” of end of new replacement bricks. Provide 8mm (5/16” min, 3/8” max diameter) x 195mm (7.6” min, 8”max) ties in walls.
5. Repoint mortar and sealant joints in lifts not to exceed 1/4" and tooled when “thumb print” hard.
6. Clean brick and stone masonry.
7. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include recommendations for applications and use. Include test data substantiating that products comply with requirements. Submit data sheets for all proposed cleaning and repair materials.

B. Samples for Initial Selection: For the following:

1. Colored Mortar: Submit sets of mortar that will be left exposed in the form of sample mortar strips, 6 inches (150 mm) long by 1/2 inch (13 mm) wide, set in aluminum or plastic channels.

    a. Have each set contain a close color range of at least six of different mixes of colored sands and cements that produce a mortar matching existing, cleaned mortar when cured and dry.
    b. Submit with precise measurements on ingredients, proportions, gradations, and source of colored sands from which each Sample was made.

2. Sand Types Used for Mortar: Minimum 8 oz. (240 mL) of each in plastic screw-top jars.
3. Patching Compound: Submit sets of patching compound Samples in the form of plugs (patches in drilled holes) in sample units of masonry representative of the range of masonry colors on the building.

    a. Have each set contain a close color range of at least six Samples of different mixes of patching compound that matches the variations in existing masonry when cured and dry.

C. Samples for Verification:

1. Each type of brick unit to be used for replacing existing units. Include sets of Samples to show the full range of shape, color, and texture to be expected. For each brick type, provide straps or panels containing at least four bricks. Include multiple straps for brick with a wide range.
2. Each type of limestone unit to be used for replacing or providing new units.
3. Each type of patching compound in the form of briquettes, at least 3 inches (75 mm) long by 1-1/2 inches (38 mm) wide. Document each Sample with manufacturer and stock number or other information necessary to order additional material.
4. Accessories: Each type of accessory and miscellaneous support.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For brick and stone masonry repair specialists including field supervisors and workers.

B. Preconstruction Test Reports: For existing bricks and replacement bricks.

C. Restoration Program: For each phase of restoration process, provide detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of restoration work, including protection of surrounding materials on building and Project site.

1. If materials and methods other than those indicated are proposed for any phase of restoration work, provide a written description, including evidence of successful use on comparable projects, and a testing program to demonstrate the effectiveness for this project.

D. Cleaning Program: Prepare a written cleaning program that describes cleaning process in detail, including materials, methods, and equipment to be used; protection of surrounding materials; and control of runoff during operations. Include provisions for supervising worker performance and preventing damage.

1. If materials and methods other than those indicated in Section 2.10 and 3.5 are proposed for any phase of cleaning work, add a written description of such materials and methods, including evidence of successful use on comparable projects and demonstrations to show their effectiveness for this Project.

E. Mockups: Perform test treatments on a discrete area and receive approval before full work begins.

1.8 QUALITY ASSURANCE

A. Masonry Repair and Cleaning Specialist Qualifications: Engage an experienced masonry repair and cleaning firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing masonry is insufficient experience for masonry repair work.

1. At Contractor’s option, work may be divided between two specialist firms: one for cleaning work and one for repair work.
2. Field Supervision: Restoration specialist firms shall maintain experienced full-time supervisors on Project site during times that masonry restoration and cleaning are in progress.
3. Restoration Worker Qualifications: Persons who are experienced and specialize in restoration work of types they will be performing.

B. Chemical Manufacturer Qualifications: A firm regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-trained representatives who are available for consultation and Project-site inspection and assistance at no additional cost to Owner.

C. Mockups:
1. Prepare brick and stone masonry repair and cleaning as follows to demonstrate aesthetic effects and to set quality standards for materials and execution and for fabrication and

installation. Prepare mockups on existing walls under same weather conditions to be expected during remainder of the Work, to be reviewed by Architect and Owner:

a. Masonry Repair: Repair an area approximately 36 inches high by 48 inches wide for each type of masonry material indicated to be rebuilt or replaced.
   1) Include one area with full brick replacement, and one area with brick patching as indicated on the drawings.
b. Cleaning: Clean an area approximately 25 sq. ft. in area for each type of clay masonry and surface condition. Refer to Section 2.10 and 3.5 for cleaning protocol. Refer to existing field installed masonry mockup for benchmark cleaning requirements.
c. Pointing: Rake out joints in area approximately 36 inches high by 72 inches wide for each type of repointing required and repoint.
d. High Performance Masonry Coating: Test a minimum 4ft. by 4ft. area on each type of masonry. Use the manufacturer's application instructions. Let test area protective treatment cure before review. Keep test panels available for comparison throughout the protective treatment project.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on brick masonry as follows:

1. Provide test specimens as indicated and representative of proposed materials and existing construction.
2. Replacement Brick: Test each proposed type of replacement brick according to sampling and testing methods in ASTM C67 for compressive strength, 24-hour cold-water absorption, five-hour boil absorption, saturation coefficient, and initial rate of absorption (suction).
3. Existing Brick: Test each type of existing brick indicated for replacement according to testing methods in ASTM C67 for compressive strength, 24-hour cold-water absorption, five-hour boil absorption, saturation coefficient, and initial rate of absorption (suction). Carefully remove five existing units from locations designated by Architect. Take testing samples from these units.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver bricks to Project site strapped together in suitable packs or pallets or in heavy-duty cartons and protected against impact and chipping.

B. Deliver packaged materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.

C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

D. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.

E. Store sand where grading and other required characteristics can be maintained, and contamination avoided.

F. Handle bricks to prevent overstressing, chipping, defacement, and other damage.

1.11 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit brick masonry repair work to be performed according to product manufacturers' written instructions and specified requirements.

B. Temperature Limits: Repair brick masonry only when air temperature is between 40 and 90 deg F (4 and 32 deg C) and is predicted to remain so for at least seven days after completion of the Work unless otherwise indicated.

C. Cold-Weather Requirements: Comply with the following procedures for masonry repair unless otherwise indicated:

1. When air temperature is below 40 deg F (4 deg C), heat mortar ingredients, masonry repair materials, and existing masonry walls to produce temperatures between 40 and 120 deg F (4 and 49 deg C).
2. When mean daily air temperature is below 40 deg F (4 deg C), provide enclosure and heat to maintain temperatures above 32 deg F (0 deg C) within the enclosure for seven days after repair.

D. Hot-Weather Requirements: Protect masonry repairs when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks, and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F (32 deg C) and above unless otherwise indicated.

E. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Source Limitations: Obtain each type of material for repairing brick masonry (brick, cement, sand, etc.) from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 MASONRY MATERIALS

A. Building Brick: ASTM C62, of same vertical dimension as face brick, for masonry work concealed from view.

1. Grade SW where in contact with earth.
2. Grade SW, MW, or NW for concealed backup.

2.3 CLAY FACE BRICK

A. General: Contractor to use salvaged face brick to greatest extent possible. If salvaged brick quantities do not allow for completion of Work, provide new face brick in shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
   1. Clay Face Brick: Facing brick complying with ASTM C 216. Field tan face brick blend to match existing building.

   2. Type, Grade, Style, and Size to be confirmed per pre-construction brick testing.
   3. Initial Rate of Absorption: Less than 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested according to ASTM C 67.
   4. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."

2.4 MORTAR MATERIALS AND MIXES

A. Provide separate mortar materials for brick masonry and limestone repair work. A mortar analysis is available for review by Contractor.

B. Brick Mortar: Portland Cement-Dry Hydrated Lime-Sand mortar, ASTM C 270 Type N.
   1. Portland Cement: ASTM C150/C150M, Type I or Type II, may be used for cold-weather construction; white or gray, or both where required for color matching of mortar.
      a. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C114.
   2. Hydrated Lime: ASTM C207.
   3. Mortar Sand: ASTM C144.
      a. Exposed Mortar: Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
      b. Colored Mortar: Natural sand or ground marble, granite, or other sound stone of color necessary to produce required mortar color.

C. Limestone Mortar: Lime-Sand mortar.
   1. Hydrated Lime: ASTM C207.
      a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
         1) Lancaster Lime Works.
         2) US Heritage Group.
         3) Edison Coatings.
   2. Mortar Sand: ASTM C144.
      a. Exposed Mortar: Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.

D. Mortar Proportions: Mix mortar materials in the following proportions:

   1. Pointing Mortar for Brick: Match existing mortar in content and color. Final mortar selection shall be reviewed in conjunction with brick testing; new mortar to be of a weaker compressive strength than brick masonry. Assume 1-part Portland cement, 1 part lime, 5 parts sand. Confirm through laboratory test of existing mortar and submit proposed mix for approval.

   2. Pointing Mortar for Stone: Match existing mortar in content and color. Assume 1-part lime, 2 parts sand. Confirm through laboratory test of existing mortar and submit proposed mix for approval.

E. Mortar Pigments: ASTM C 979/C 979M, compounded for use in mortar mixes, and having a record of satisfactory performance in masonry mortars. Pigments shall be obtained from a single lot; check lot number to ensure consistent color.

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

a. Davis Colors.
b. Lanxess Corporation, Bayferrox.
c. Solomon Colors, Inc.

F. Water: Potable.

G. Do not use admixtures in mortar.

H. Measurements and mixing: Measure cementitious and aggregate material in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. To avoid over-sanding, mortar sand to be added in a damp, loose condition. Mix materials in a clean, mechanical batch mixer.

1. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding any water. The mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 1-2 hours. Add remaining water in small portions until reaching mortar of the desired consistency. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material.

2. Lime putty-sand mortar should be mixed in a vertical shaft mixer.

2.5 CLEANING MATERIALS

A. Water: Potable.

B. Hot Water: Where required water heated to a temperature of 140 to 160 deg F (60 to 71 deg C).

C. Detergent Cleaner - General Cleaning of Environmental Deposits, Mold, Mildew, and Algae: D/2 Biological Solution shall be used. D/2 is biodegradable, pH neutral, and contains no chlorine or acids. Products containing chlorine or acids shall not be used. D/2 Biological Solution is available nationwide; for a distributor in your region see the D/2 website www.d2bio.com or call (917) 693-7441.
1. Natural bristle brushes
2. Soft, clean rags
3. Clean, potable water
4. Rubber gloves
5. Eye and skin protection
6. Low-pressure applicator, such as pump sprayer or electric/battery powered sprayer, Pressure washers using 600 psi or less.

D. Solvent Cleaner: Cleaning of Coatings and Sealant Deposits: CITRA-SOLV by ATCO International. keepintouch@citrasolv.com, 800-343-6588.
1. Rubber or neoprene gloves
2. Safety glasses - Do not get in eyes, on skin, or on clothing.
3. Wear chemical protective clothing.
4. Wash hands thoroughly after handling.

5. Disperse or ventilate the area with fresh air.
6. Remove all sources of ignition.
7. Beware of vapors accumulating to form explosive concentrations.
8. Absorb spill with inert material (e.g. dry sand or earth) and dispose of in accordance with applicable regulations.
9. Flush thoroughly with fresh, tepid water for 15 minutes.
10. Discard contaminated clothing and footwear or wash before reuse.
11. If skin irritation occurs: Get medical advice/attention.

2.6 ACCESSORY MATERIALS

A. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, glazed masonry, and polished stone surfaces from damaging effects of acidic and alkaline masonry cleaners.

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

a. American Building Restoration Products, Inc.; LM 130 Acid Shield.
b. Price Research, Ltd.; price Mask
c. PROSOCO, Inc.; Sure Klean Strippable Masking

B. Setting Buttons and Shims: Resilient plastic, nonstaining to masonry, sized to suit joint thicknesses and bed depths of bricks, less the required depth of pointing materials unless removed before pointing.

C. Masking Tape: Nonstaining, nonabsorbent material; compatible with mortar, joint primers, sealants, and surfaces adjacent to joints; and that easily comes off entirely, including adhesive.

D. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:

1. Previous effectiveness in performing the work involved.
2. Minimal possibility of damaging exposed surfaces.
3. Consistency of each application.
4. Uniformity of the resulting overall appearance.
5. Do not use products or tools that could leave residue on surfaces.

PART 3 - EXECUTION

3.1 PROTECTION

A. Prevent mortar from staining face of surrounding masonry and other surfaces.

1. Cover sills, ledges, and other projecting items to protect them from mortar droppings.
2. Keep wall area wet below rebuilding and repair work to discourage mortar from adhering.
3. Immediately remove mortar splatters in contact with exposed masonry and other surfaces.

B. Protect existing surface-mounted equipment, conduit, wiring/cable to remain. Provide temporary supports where required to allow for installation of masonry work.

C. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, and surrounding buildings from harm resulting from masonry restoration work.

1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of restoration and cleaning work.

D. Comply with chemical cleaner manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical cleaning solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
2. Keep wall wet below area being cleaned to prevent streaking from runoff.
3. Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
4. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.
5. Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

3.2 BRICK REMOVAL AND REPLACEMENT

A. At locations indicated, remove bricks that are damaged, spalled, or deteriorated or are to be reused. Carefully remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.

1. When removing single bricks, remove material from center of brick and work toward outside edges.

B. Support and protect remaining masonry that surrounds removal area.

C. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition. Coordinate with new flashing, reinforcement, and lintels.

D. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.

E. Remove in an undamaged condition as many whole bricks as possible.

1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
2. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.
3. Store brick for reuse. Store off ground, on skids, and protected from weather.
4. Deliver cleaned brick not required for reuse to Owner unless otherwise indicated.

F. Clean masonry surrounding removal areas by removing mortar, dust, and loose particles in preparation for brick replacement.

G. Replace removed damaged brick with other removed brick in good condition, where possible, or with new brick matching cleaned existing brick. Do not use broken units unless they can be cut to usable size.

H. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

1. Maintain joint width for replacement units to match existing joints.
2. Use setting buttons or shims to set units accurately spaced with uniform joints.

I. Lay replacement brick with rebuilding (setting) mortar and with completely filled bed, head, and collar joints. Butter ends with enough mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. (30 g/194 sq. cm per min.) Use wetting methods that ensure that units are nearly saturated, but surface is dry when laid.

1. Install helical ties through mortar joints of new units. See Section 040510 Masonry Helical Ties.
2. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
3. Rake out mortar used for laying brick before mortar sets according to Section 040120.64 "Brick Masonry Repointing." Point at same time as repointing of surrounding area.
4. When mortar is hard enough to support units, remove shims and other devices interfering with pointing of joints.

J. Curing: Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.

1. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

3.3 CLEANING MASONRY

A. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other. Ensure that dirty residues and rinse water do not wash over dry, cleaned surfaces.

B. Use only those cleaning methods indicated for each masonry material and location.

1. Brushes: Do not use wire brushes or brushes that are not resistant to chemical cleaner being used. Use natural-fiber brushes only.
2. Spray Equipment: Use spray equipment that provides controlled application at volume and pressure indicated, measured at nozzle. Adjust pressure and volume to ensure that cleaning methods do not damage surfaces, including joints.

    a. Equip units with pressure gages.
    b. For water-spray application, use fan-shaped spray that disperses water at an angle of 25 to 50 degrees.
    c. High-pressure water-spray application is not acceptable for this Project.
    d. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F (60 and 71 deg C) at flow rates indicated.

C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without

streaking or damaging masonry surfaces. Keep wall wet below area being cleaned to prevent streaking from runoff.

D. Perform additional general cleaning, paint and stain removal, and spot cleaning of small areas that are noticeably different when viewed so that cleaned surfaces blend smoothly into surrounding areas.

E. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to cleaning methods being used. Extraneous substances include paint, caulking, asphalt, and tar.

F. Water Application Methods:

1. Water-Soak Application: Where required soak masonry surfaces by applying water continuously and uniformly to limited area for time indicated. Apply water at low pressures and low volumes in multiple fine sprays using perforated hoses or multiple spray nozzles. Erect a protective enclosure constructed of polyethylene sheeting to cover area being sprayed.
2. Water-Spray Applications: Unless otherwise indicated, hold spray nozzle at least 6 inches (150 mm) from masonry surface and apply water in horizontal back-and-forth sweeping motion, overlapping previous strokes to produce uniform coverage.

G. Chemical-Cleaner Application Methods: Apply chemical cleaners to masonry surfaces according to chemical-cleaner manufacturer's written instructions; use brush application. Do not allow chemicals to remain on surface for periods longer than those indicated or recommended in writing by manufacturer.

H. Detergent Cleaner - General Cleaning of Environmental Deposits, Mold, Mildew, and Algae: D/2 Biological Solution
1. Pre-wet surface with water under mains pressure.
2. Apply undiluted D/2 by scrubbing into the surface with a stiff, nylon-bristled brush.
3. Reapply D/2 as the masonry dries by scrubbing with D/2 and a stiff-bristled brush.
4. Rinse surface after 15-minute dwell time with water under mains pressure.
5. Repeat at heavily soiled areas with scrubbing with a stiff, nylon-bristled brush and water, and rinse again.

I. Solvent Cleaner: Cleaning of Coatings and Sealant Deposits: CITRA-SOLV by ATCO International.
1. Remove brittle material build-up by dry scraping.
2. Rub scraped surface with a rag saturated with solvent.
3. Rub solvent-dampened area with a dry rag to remove residues of solvent and loosened material.
4. Repeat rubbing and drying until the surface is as clean as possible.
5. Dry scrape the edges of brick again to remove heavier deposits.
6. Repeat process of wiping with solvent and drying.
7. Wipe clean surface with a rag dampened with water then wiped with a dry rag.
8. Sprayed surface with water using a spray bottle, then wipe with a dry rag.

J. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water runoff of cleaned area to determine that chemical cleaner is completely removed.

1. Apply neutralizing agent and repeat rinse if necessary to produce tested pH of between 6.7 and 7.5.

K. After cleaning is complete, remove tape and adhesive marks and protection no longer required.

3.4 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water applied by low-pressure spray.

1. Do not use metal scrapers or brushes.
2. Do not use acidic or alkaline cleaners.

B. Clean adjacent nonmasonry surfaces. Use detergent and soft brushes or cloths.

C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

D. Remove masking materials, leaving no residues that could trap dirt.

3.5 REPOINTING MASONRY

A. Rake out and repoint 100 percent of mortar joints in Project area.

B. Rake out joints as follows:

1. Remove mortar from joints to depth of 2 times joint width, but not less than 1/2 inch or not less than required to expose sound, unweathered mortar.
2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
3. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Architect.

    a. Cut out mortar by hand with chisel and mallet. Do not use power-operated grinders without Architect’s written approval based on submission by Contractor of a satisfactory quality control program and demonstrated ability of operators to use tools without damaging masonry. Quality control program shall include provisions for supervising performance and preventing damage due to worker fatigue.

C. Point joints as follows:

1. Rinse masonry-joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen masonry-joint surfaces before pointing.
2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch until a uniform depth is formed. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
3. After low areas have been filled to same depth as remaining joints, point all joints by placing mortar in layers not greater than 3/8 inch. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing bricks have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces. Take care not to spread mortar over edges onto exposed masonry surfaces or to featheredge mortar.

4. When mortar is thumbprint hard, tool joints to match original appearance of joints. Remove excess mortar from edge of joint by brushing.
5. Cure mortar by maintaining in a damp condition for at least 72 hours.

D. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.

B. Notify inspectors in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until inspectors had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

3.7 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials shall be used for reinstallation to greatest extent possible. Where additional materials remain following completion of work, excess masonry materials are Contractor's property.

B. Masonry Waste: Refer to Section 017419 Construction Waste Management and Disposal.

END OF SECTION 040120

SECTION 011100 – SUMMARY OF THE WORK

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section summarizes construction operations required by the Contract Documents, defines aspects of Prime Contractor's relationship with City and lists special City requirements.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 PROJECT DESCRIPTION

A. The Work covers the renovation of Happy Hollow Recreation Center and playground for Philadelphia Parks and Recreation located at 4800 Wayne Avenue in Philadelphia, Pennsylvania 19144.

For complete scope of work please refer to the Project Drawings and the Specifications. This project is part of the City's Rebuilding Community Infrastructure Program ("Rebuild").

1.4 CONTRACTS

A. Construct Work under a Prime Contract for General Construction Work.

B. General Construction Work: Provide all the Work of the Contract, no matter where the information is located, except as specifically indicated to be performed by other Prime Contractors.

1. Selective demolition and new construction as required for new Mechanical, Plumbing and Electrical Work but only if indicated on the Demolition or Architectural Drawings. Cutting and patching required by the other Prime Contractors and not specifically indicated on the drawings are the responsibility of the respective Prime.
   a. Remove conduit runs with wiring, boxes and devices built into existing walls, floors or roof slabs which are to be removed.
2. Install access doors and panels, anchors, embedments, bolts, plates, sleeves, boxes, etc. furnished under other Contracts.
3. Provide blocking, backing, box-outs, openings, recesses, etc. required for the Work of other Contracts.
4. Provide a dumpster for the use of all Contractors.
5. Provide periodic and final cleaning of building and site.
6. Normal patching of sprayed-on fireproofing required because of the installation of Work required in other Contracts.
7. Provide control lines and elevation benchmarks at central locations for the extension by other Prime Contractors.
8. Provide temporary site perimeter fence and sidewalk cover if required.

9. Provide temporary toilet facilities for all Contractors.
10. Provide base flashing of roof-mounted curbs and rails provided under other Prime Contracts.
11. Provide painting of all surfaces and equipment exposed to view in the finished Work, regardless of which Prime Contractor provided the surface or equipment.
12. Furnish starters and disconnects for electrical components of systems included in the General Construction Work for installation under the Electrical Contract.

1.5 WORK BY OTHERS

A. Work on this Project which will be executed during the time of construction of the Work of this Contract and which is excluded from this Contract, is as follows:

1. Direct purchase and installation of play equipment and sprayground equipment.

2. Sprayground plumbing manifold and sprayground equipment piping.

B. Work on this Project which will be executed subsequent to completion of Work of this Contract and which is excluded from this Contract, is as follows:

1. None.

1.6 PRE-PURCHASED PRODUCTS

A. Products pre-purchased by the City, and assigned to this Contract are as follows:

1. Play Equipment, Section 116800.
2. Sprayground Systems, Section 116800.01.

B. City's Responsibilities

1. Advise Contractor of delivery date.
2. Obtain installation drawings and instructions.
3. Submit claim for transportation damages and replace damaged, defective or deficient items.
4. Arrange guarantees and warranties and training.

C. Contractor's Responsibilities

1. Coordinate delivery date.
2. Inspect delivered products for damaged or defective items. Failure to notify the City of damage at time of receipt constitutes Contractor’s acceptance of pre-purchased item.
3. Unload and handle at site, including uncrating and storage.
4. Protect from exposure to elements and from damage.
5. Repair or replace items damaged as a result of Contractor's operations.

1.7 FUTURE WORK

A. The Project is designed for future work including:

1. None.

B. Ensure that Work is clear of encroachment into areas required for future work.

1.8 PHASING

A. Construct work in phases to accommodate City's use of premises during construction period.

B. Coordinate the construction schedule and operations with the Project Coordinator.

C. Phases
1. Phase 1 shall include playground and sprayground, accessible site access, site furnishings, and any work required to provide access to existing gym. The playground and sprayground,are expected to be open to the public by May 25, 2026.
2. Phase 2 shall include all remaining work not included in Phase 1.

D. Base bid shall include all temporary protections, general conditions, and mobilization required due to phasing requirements.

1.9 CONTRACTOR'S USE OF PREMISES

B. Prime Contractors shall limit use of the premises for Work and for storage to allow:

1. Owner occupancy
2. Public use

C. Coordinate use of premises with Project Coordinator

D. Protect products stored on-site

E. Store products to avoid interference with operations of City or other Prime Contractors

F. Secure and pay for additional storage and work areas if required by Contractor.

G. Do not overload structure with stored materials.

1.10 PARTIAL CITY OCCUPANCY

A. Schedule early completion of designated areas for City's use prior to completion of the entire project, as per the phasing requirements.

B. City will occupy playground area and existing gym for purposes of public use and access while renovations of Activities Building are completed.

C. Provide for City's use:

1. Access for employees.
2. Operation of necessary utilities.

D. Prior to occupancy by City, execute Certificate of Substantial Completion for the area of occupancy. Contractor shall obtain a Temporary Certificate of Occupancy from L&I for the areas listed on the Certificate of Substantial Completion.

E. For the area of partial occupancy, the City will provide security and custodial services.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 011100

SECTION 116623 – GYMNASIUM EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Boxing equipment

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Court layout plans, and other details, drawn to scale, and coordinated with ceiling-suspended gymnasium equipment, floor platforms, and markers applied to finished flooring, and coordinated with each other, using input from installers of the items involved.

B. Product Certificates: For each type of gymnasium equipment.

C. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of gymnasium equipment that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 BOXING EQUIPMENT

A. Basis of Design: TITLE Boxing Dual Level Drop-N-Lock Competition Ring, 20’-0” x 20’-0”

B. Accessories:

1. Provide additional ring canvas
2. TITLE Boxing Professional Ring Stairs
3. Provide required ¾” T&G plywood

C. Supports:

1. Provide wooden floor platform constructed in coordination with and approved by manufacturer.

D. Other Acceptable Manufacturers:

1. Ringside

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with manufacturer's written installation instructions and competition rules for each type of gymnasium equipment.

B. Permanently Placed Gymnasium Equipment and Components: Install rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated; in proper relationship to adjacent construction; and aligned with court layout.

C. Removable Gymnasium-Equipment Components: Assemble in place to verify that equipment and components are complete, in proper working order, and is approved by Owner.

D. Adjust movable components of gymnasium equipment to operate safely, smoothly, easily, and quietly; free from binding, warp, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range; and lubricate as recommended in writing by manufacturer.

3.2 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain gymnasium equipment.

END OF SECTION 116623

SECTION 310000 - EARTHWORK

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. The work under this Section shall include all labor, material, equipment and all else necessary for cutting, proof rolling, filling and grading to required lines, dimensions, contours and elevations for proposed improvements as hereinafter specified and/or as otherwise required for the proper and timely completion of this Contract. Work under this Section includes, but is not limited to, subgrade preparation, excavating, backfilling, and compaction for structures and foundations, pavements, sidewalks, landscaping areas, and utilities. The contractor shall pay for and coordinate the services of a geotechnical engineer and testing agency to perform quality control of the earthwork.

B. Scarifying, compaction, moisture content conditioning and control, and removal of unsuitable material to ensure proper preparation of areas for the proposed improvements.

C. Undertake any special construction procedures for the project as shown in the drawings and described by these specifications for preparation of pavement areas.

1.2 RELATED DOCUMENTS

A. Related Requirements:

1. Section 321600 – Concrete Curbs
2. Section 321623 – Sidewalks

1.3 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM), latest edition

1. C 33 Concrete Aggregates
2. D 698 Laboratory Compaction Characteristics of Soil Using Standard Effort
3. D 1556 Density and Unit Weight of Soils in Place by the Sand-Cone Method
4. D 1557 Laboratory Compaction Characteristics of Soil Using Modified Effort
5. D 2167 Density and Unit Weight of Soil in Place by Rubber Balloon Method
6. D 2216 Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
7. D 2487 Classification of Soils for Engineering Purposes (Unified Soil Classification System)
8. D 2937 Density of Soil in Place by the Drive-Cylinder Method
9. D 3740 Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
10. D 4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils
11. D 4254 Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density
12. D 6938 In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

B. American Association of State Highway and Transportation Officials (AASHTO), latest edition

1. T 88 Particle Size Analysis of Soils

C. Associated General Contractors of America

1. Manual of Accident Prevention in Construction

1.4 QUALITY ASSURANCE

A. A geotechnical engineer familiar with the project requirements, selected and paid by the ~~Owner~~Contractor, ~~may~~ shall be retained to perform construction inspection on site based on density testing, visual observation, and judgement. This inspection will not relieve the Contractor of his responsibility to complete the work in accordance with the drawings and specifications.

B. Visual field confirmation and density testing of subgrade preparation and fill placement procedures shall be performed by the field geotechnical engineer as part of the construction testing requirements. The Contractor shall be informed as soon as possible of the test results.

C. The geotechnical engineer shall prepare field reports that indicate compaction test location, elevation data, testing results and acceptability. The Owner, engineer, and Contractor shall be provided with written copies of the results within 24 hours of time test was performed.

D. All costs related to reinspection due to failures shall be paid for by the Contractor at no additional expense to Owner. The Owner reserves the right to direct any inspection that is deemed necessary. Contractor shall provide free access to site for inspection activities.

1.5 SUBMITTALS

A. Testing Agency Qualifications: Provide a statement of qualifications of the geotechnical engineer and testing agency that will perform the quality control tasks required in Article 3.08.

1. The geotechnical engineer shall be an experienced inspector working under the direction of the professional engineer licensed to practice in the Commonwealth of Pennsylvania who is experienced in providing engineering services related to earthwork.
2. The testing agency shall be an independent laboratory having a minimum of three (3) years' experience in conducting the testing indicated herein.
3. The testing laboratory shall meet the requirements of ASTM D 3740.

B. Material Test Reports: Shall be provided from the testing agency indicating and interpreting test results for compliance on the following:

1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D 1557 for each on-site or borrow soil material proposed for fill and backfill; provide for each material type and for every 5,000 cubic yards of each material.
3. Material Gradation Tests.
4. Electrical Resistivity and pH tests for sand used for water pipe bedding and backfill.

C. Within 10 days after award of the contract, the Contractor shall submit to the Owner and engineer a schedule detailing the sequence, and time of completion of all phases of work under this section.

D. At least two weeks in advance of imported fill use, the Contractor shall submit the following laboratory test data to the geotechnical engineer for each type of imported soil/gravel material to be used as compacted fill.

1. Moisture and Density Relationship: ASTM D1557;
2. Particle-Size Analysis: ASTM D2487; and,
3. Plasticity Index: ASTM D 4318.

E. Together with the above test data, the Contractor shall submit a 25-pound sample of each type of off site fill material in an airtight container for the approval of the geotechnical engineer.

F. Submit the name of each material supplier and specific type and source of each material. Any change in source or soil type throughout the job requires approval of the Owner and the engineer.

1.6 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation.

B. Base Course: Layer placed between the subgrade and paving.

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

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

E. Classification: No consideration will be given to the nature of earthen materials, and all excavation required for this Project will be designated as unclassified.

F. Degree of Compaction: Degree of compaction required is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated hereinafter as percent laboratory maximum density. For granular material, relative density is determined in accordance with ASTM D 4254.

G. Excavation: Removal of material encountered down to subgrade elevations:

1. Bulk Excavation: Excavation more than 10 feet in width.
2. Overexcavation: Excavation of existing unsuitable material beyond limits shown on the Drawings for replacement with structural fill as directed by the Owner.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond limits shown on the Drawings without direction by the Owner.

H. Hard Material: Weathered rock, dense consolidated deposits, or buried construction debris (i.e., demolished brick walls, concrete, etc.) which are not included in the definition of “rock”, but which usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.

I. Rock:

1. General Excavation - Any material that cannot be excavated with a single-toothed ripper drawn by a crawler tractor having a minimum draw bar pull rated at not less than 71,000 lbs. (Caterpillar D9N or equivalent), and occupying an original volume of at least 2 cubic yards or more; and,
2. Trench Excavation - Any material that cannot be excavated with a backhoe having a break out force rated at not less than 44,000 lbs. (Caterpillar 235D or equivalent) and occupying an original volume of at least 2 cubic yards.

J. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below base or topsoil materials.

K. Subbase: Material shown on the Drawings between the pavement base and subgrade.

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

1.7 REGULATORY COMPLIANCE

A. Codes and Standards: Perform earthwork complying with federal, state, and local regulations including the Occupational Safety and Health Act of 1970 as amended. Excavation and trenching

are regulated by OSHA. The Contractor shall perform all excavation and trenching work in accordance with 29 CFR 1926 Subpart P.

B. Conform with Pennsylvania Act 287 and all amendments and other applicable regulations regarding notification of utility companies.

C. Any pumped water shall be discharged from the Site in accordance with federal, state and local codes and regulations. Comply with all Philadelphia Water Department permit requirements.

1.8 PROJECT CONDITIONS

A. Utility Identification: Notify PA One-Call System at 1-800-242-1776 at least 3 days prior to excavation.

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

1. Notify the Owner not less than 72 hours in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without the Owner's written permission.

C. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

D. Existing improvements, adjacent property, and other facilities and trees and plants that are not to be removed shall be protected from injury or damage, which may result from Contractor's operation.

E. Provide positive drainage away from all structures.

F. Unless otherwise noted, minimum slope shall be ¼ inch per foot or 2% and a maximum slope shall not exceed 3:1 (h:v) or 33% for non-paved surfaces. Paved surfaces shall have a minimum grade or 1% and have positive drainage off of the pavement.

G. Grades on designated handicapped accessible areas/routes shall comply with the provisions of the Americans with Disabilities Act.

H. Notify the PPR immediately if slope requirements cannot be met. At no time will slopes in excess of those above the maximum allowed, be accepted, unless prior approval is received in writing by PPR.

I. Grade earthen, non-paved, surfaces to a smooth finish. Slope lawn areas in swales to a gentle crown along the centerline.

J. Grade all seeded fine lawn areas flush with finish grade. Adjust finished grade to the proper depth where sod abuts paved areas.

K. Grade all tree/shrub/groundcover planting beds to 3 inches below top of abutting curbs, paving, or lawn areas to allow for mulching.

L. Adjust existing and new manhole, catch basins, and drains rim/grate elevations to new grade elevations (pavement or soil).

M. Finished surfaces shall be graded smooth and even with no abrupt or awkward changes in grade.

N. Provide properly compacted subgrades of native soil or approved fill. Native soils, fill, or subgrades deemed insufficient shall be removed and replaced with appropriate material. Subgrades shall be inspected by a qualified inspector to ensure compaction requirements are met. Submit test reports and field logs to PPR for review and for record.

O. Existing on-site soils should be evaluated for both suitability for use in construction as well as environmentally for contaminants by licensed and qualified professionals such geotechnical engineers and environmental scientists. Many sites throughout the City include various types of urban fill. In some cases there may be abandoned structures below grade. These soils and features should be evaluated before design and engineering newly planned features. Also, environmental due diligence and/or testing should be completed near the beginning of design and engineering to ascertain if on-site materials are clean or regulated. Testing of existing on-site soils and materials shall comply with the requirements of Pennsylvania Department of Environmental Protection requirements for fill management whether it is determined to be clean or regulated. Submit geotechnical testing and environmental due diligence reports to PPR for review and for record.

P. Any soil materials leaving the site or being brought to the site shall comply with the Pennsylvania Department of Environmental Protection requirements for fill management.

Q. Environmental due diligence: investigative techniques, including, but not limited to, visual property inspections, electronic data base searches, review of property ownership, review of property use history, sanborn maps, environmental questionnaires, transaction screen, analytical testing, environmental assessments or audits. Submit all environmental due diligence reports to PPR for review and for record.

R. Analytical testing is not a required part of due diligence unless visual inspection and/or review of the past land use of the property indicates that the fill may have been subjected to a spill or release of a regulated substance. If the fill may have been affected by a spill or release of a regulated substance, it must be tested to determine if it qualifies as clean fill. Testing should be performed in accordance with appendix a of PADEP's policy "management of fill".

S. Fill material that does not qualify as clean fill is regulated fill. Regulated fill is waste and must be managed in accordance with the municipal or residual waste regulations in 25 pa code chapters 287 residual waste management or 271 municipal waste management, whichever is applicable.

T. Designers and contractors shall comply with the Pennsylvania Underground Utility Line Protection Law, Act 287 of 1974, as amended by Act 50 of 2017. This includes contacting the Pennsylvania One Call System or 811 as required by law.

U. Designers and contractors, in additional to complying with the Pennsylvania Underground Utility Line Protection Law requirements shall research available utility records from the project owner for the site or facility. Upon evaluation of these records the designer or contractor can evaluate the need for extensive underground utility locating depending the project. The designer or contractor shall determine the need and level of underground utility located needed for the project in conformance with the American Society of Civil Engineers (ASCE) National Consensus Standard – ASCE C-I 38-02, Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data. The designer or contractor shall determine the Quality Level of utility located required by the project, Levels D, C, B, or A. The costs associated with underground utility locating services shall be evaluated and balanced with the available utility information, conditions in the field, the type of project being proposed, the risks associated with utility conflict and/or damage, and the ability of a utility locator to obtain information. These evaluations shall be done in consultation with Philadelphia Parks and Recreation.

PART 2 - PRODUCTS

2.1 ON-SITE FILL

A. On-site excavated materials may be used as backfill provided they meet the following criteria:

1. Suitable backfill materials include soil that complies with ASTM D 2487 soil classifications GW, GP, GM, SW, SP, and SM and having a maximum particle size of three (3) inches in any one dimension.
2. Unsuitable backfill materials include any material having an excess of wood, timber, metal, rebar, organics, debris, or any other deleterious materials.

B. It is not permitted for excavated materials unsuitable for fill in their as-is state to be processed on-site to comply with suitable backfill requirements. Concrete, brick, asphalt debris is not permitted to be broken or crushed on site to meet the above particle size requirement.

C. The Contractor shall use the on-site soil judiciously to facilitate the construction schedule.

D. Prior to placement, on-site material to be used as fill shall not contain:

1. Debris other than crushed concrete and brick meeting the above requirements.
2. Timber or railroad ties.
3. Other deleterious materials such as steel rails, rebar, trash, etc.
4. Hazardous material - Unsuitable and deleterious materials and debris shall be disposed of off-site in accordance with all applicable regulations.

E. Any bituminous concrete on the site shall be milled/removed prior to placing any fill and shall be reused only onsite immediately below the pavement stone base course.

2.2 OFF-SITE IMPORTED FILL

A. If necessary, off-site fill shall be obtained and provided by the Contractor;

B. Fill shall be clean, well graded granular soil which is non-expansive and non-collapsible and shall have between 5% and 15% by weight passing the #200 sieve. The portion passing the #200 sieve shall be non-plastic with a plasticity index not greater than five. Fill with less fines (less than #200 sieve) may be required on project specific basis and as required by geotechnical engineer. Likewise, fill with more than 20% fines may be acceptable on a project specific basis or as identified in the geotechnical engineering study;

C. Imported fill shall be free of all hazardous substances. Certification of compliance and, if requested, test results substantiating compliance shall be furnished to the Owner and geotechnical engineer by the Contractor not less than one week prior to its intended use;

D. The Owner reserves the right to test off-site fill material for conformance with these specifications; and,

E. The Contractor shall be responsible for all permits and regulatory requirements associated with off-site borrow sources.

2.3 STONE BACKFILL

A. In accordance with PennDOT Publication 408, Section 703 for AASHTO No. 57 Stone.

2.4 GEOTEXTILES

A. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Grab Tensile Strength: 247 lbf; ASTM D 4632.
3. Sewn Seam Strength: 222 lbf; ASTM D 4632.
4. Tear Strength: 90 lbf; ASTM D 4533.
5. Puncture Strength: 90 lbf; ASTM D 4833.
6. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
7. Permittivity: 0.02 per second, minimum; ASTM D 4491.
8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.5 EQUIPMENT

A. Compactor for mass earthwork shall be minimum 10-ton static-drum weight vibratory roller or 10-ton static-drum weight sheep foot compactor as appropriate for the type of soil material at the site or other compactor approved by the geotechnical engineer.

B. Compactor for trenches and where access or maneuverability is limited, use a double drum walk-behind roller or vibratory plate compactor or "jumping jack" tampers.

PART 3 - EXECUTION

3.1 GENERAL

A. Prior to all work of this section, the Contractor shall become thoroughly familiar with the site, site conditions, and all portions of the work falling under this section.

B. The Contractor shall refer to the soil erosion and sediment control drawings for staging of earthwork operations and for erosion control measures to be implemented prior to commencement of earthwork.

C. Locate and identify existing utilities that are to remain and protect them from damage.

D. Notify utility companies to allow removal and/or relocation of any utilities that are in conflict with the proposed improvements.

E. Protect fences, structures, sidewalks, paving, curbs, etc. to remain from equipment and vehicular traffic.

F. Protect benchmarks, property corners and all other survey monuments from damage or displacement. If a marker needs to be removed/relocated it shall be referenced by a licensed land surveyor and replaced, as necessary, by the same at no additional cost to the Owner.

G. Remove from the site, material encountered in grading operations that, in opinion of Owner or geotechnical engineer, is unsuitable or undesirable for backfilling as per Article 2.01.

H. Identify required lines, levels, contours and datum to bring site grades to the proposed subgrade conditions inferred from the drawings.

I. Do not allow or cause any of the work performed or installed to be covered by work of this section prior to all inspections, tests and approvals.

J. Perform excavation using capable, well-maintained equipment and methods acceptable to the Owner and regulatory authorities having jurisdiction.

K. When performing grading operations during periods of prolonged wet or dry weather, provide adequate measures for surface drainage and ground water control, and moisture control of soils (i.e., wetting or drying, scarifying, and discing) so as to place and compact the soil within the moisture content range two (2) percentage points of its optimum water content. Any disturbed areas should be proofrolled at the end of each day.

L. Sloping, shoring, bracing, and fencing shall be installed in accordance with Federal OSHA requirements as well as the requirements of all regulatory authorities having jurisdiction.

M. Allow no debris to accumulate on-site. Haul debris away from the site and dispose of at no cost to the Owner.

3.2 COMPACTION OF SUBGRADE SURFACES

A. In areas to receive fill and at the final cut subgrade, proof roll and compact the exposed ground surface following clearing and grubbing and any required excavation with a minimum of four (4) passes of an approved compactor and obtain at least the following density requirement:

Location	Percent of Maximum Dry Density per ASTM D1557
Foundation Support, Pavements, Sidewalks and Wall Backfill	95%
Utility Trench Backfill	95%
Non-structural	90%

B. The proof roll, truck, and compactor equipment shall traverse the area at speed that permits the geotechnical engineer to comfortably walk alongside the equipment.

C. Any soft areas exhibiting excessive weaving or unsatisfactory material identified during excavation, fill placement, compaction and proof testing shall be removed, replaced with suitable fill, and compacted as specified above.

3.3 UNDERCUT EXCAVATION

A. When approved by the Owner and recommended by the geotechnical engineer, the Contractor may be required to remove natural soil materials in areas where fills are to be placed when determined to be undesirable in their location or condition. The Contractor shall be required to remove the undesirable material and backfill with approved material which is properly compacted.

B. At locations where unstable or unsuitable soil is shown on the drawings or identified within the geotechnical engineering study, the removal and replacement of such soil shall be as directed on the drawings or as directed by the geotechnical engineer and the Owner.

C. All material removed in the work of undercut excavation will be classified by the geotechnical engineer and Owner as either suitable for other use without excessive manipulation and utilized by the Contractor elsewhere in the work, or unsuitable for future use and manipulated as per Article 2.01.

D. The Contractor shall conduct undercut operations in such a way that the necessary measurements can be taken before any backfill is placed.

E. Backfill in undercut areas shall be placed as a continuous operation along with the undercutting operation. No backfill material shall be placed in water unless otherwise permitted by the geotechnical engineer.

3.4 EXCAVATION, FILL AND SUBGRADE PREPARATION

A. General

1. The Contractor shall cut or fill to the proposed subgrade elevations based on finished grades and the pavement thicknesses as shown on the drawings. Subgrade elevations shall be constructed to within 0 to minus ½ inch of the proposed grades specified.

B. Excavation

1. Where existing grades are above proposed subgrade elevation, excavate materials to line and grade as shown in the drawings being careful not to over excavate beyond the elevations needed for building subgrades;
2. Excavate organic soils that do not provide adequate foundation support. Excavated on-site organic soils, which are unsuitable for fill may be used in landscaped areas and, if approved by the geotechnical engineer, as fill in parking area at least 5 feet below final elevation. Otherwise, this material shall be disposed of as directed by Owner;
3. Excavated on-site soils, which meet the requirements of suitable fill may be used as fill; and,
4. Unsuitable material, such as wood and any other deleterious materials determined to be unsuitable by the geotechnical engineer for use as on-site fill, shall be disposed of as directed by Owner.

C. Subgrade Preparation for Fill

1. Existing grades below proposed grades and thus requiring fill shall be leveled prior to fill placement. The Contractor shall remove existing lawn and topsoil in these areas prior to placement of any fill.
2. All existing grades to receive fill areas shall be proof rolled and compacted per Article 3.02.
3. Loose/Soft and unstable subgrade resulting from excessive moisture may be aerated and dried in-place. Following adequate drying time, the subgrade is to be densified in-place. Subgrade that cannot be aerated, dried, and densified in place shall be removed as described in Article 3.03.

D. Fill Placement

1. Rock or processed suitable debris pieces larger than six inches (6 inches) across shall not be part of fill;
2. Reduce soil clod size to a maximum of 2 inches before placement. Do not place frozen fill material;
3. No fill material shall be placed in areas of standing water, in areas of frozen or thawing ground, or in areas that have not been approved by the geotechnical engineer;
4. No fill materials shall be placed during unfavorable weather conditions. When work is interrupted by heavy rains, fill operations shall not be resumed until all saturated surficial soils are returned to a satisfactory moisture content as determined by the geotechnical engineer;
5. Fill lift surfaces shall be made smooth and free from ruts or indentations at the end of any work day when precipitation is forecast to prevent saturation of surficial fill material. Fill surfaces shall be graded to drain and sealed with a smooth drum roller at the completion of each work day;
6. The fill shall be placed in uniform loose lifts not exceeding 8-inches thick and compacted with at least 4 coverages of a 10-ton static-drum weight roller;

7. Each lift shall be compacted to the minimum densities listed in Article 3.02 as appropriate for the project and as specified in the geotechnical engineering study;
8. The Contractor shall adjust the water content by aeration or adding water to achieve the required density. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to achieve proper compaction and facilitate the construction schedule;
9. Wet, saturated material shall be air dried as necessary to achieve the field densities specified in this Section. Removal and replacement shall not occur without prior approval or Owner. Removal and replacement shall be used if necessary to facilitate the construction schedule;
10. Remove areas of finished subgrade found to have insufficient compaction density of depth necessary and replace with suitable compacted fill as approved by the Owner or Owners representative. Surface of subgrade after compaction shall be hard, uniform, smooth, stable, and true to grade and cross section; and,
11. Fill placed on slopes greater than 3 horizontal to 1 vertical (3H:1V) shall have each lift benched onto the slope at least 3 feet.

3.5 PROOFROLLING

A. The work covered by this subsection consists of furnishing and operating proofrolling equipment at the direction of the Owner's representative and/or geotechnical engineer.

B. Proofrolling shall be under the observation of the Owner's representative and/or the geotechnical engineer as described herein and under the following schedule:

1. Immediately following the completion of excavation to proposed subgrades in cut areas, proofrolling shall be performed as specified; and,
2. Immediately prior to and following stone base course placement, in pavement and building pad areas for final floor slab preparation, all subgrade and stone base areas shall be proofrolled. Any areas which deflect, rut or pump under the roller shall be undercut and replaced with compacted fill material or stone base course as directed by the geotechnical engineer and approved by the Owner.

C. Proofrolling shall be done with 1 pass of a fully loaded tandem dump truck equal to or exceeding 50,000 lbs., or other construction equipment if approved by the geotechnical engineer.

D. Construction methods shall be as follows:

1. After the subgrade or stone base course has been completed within 0.50 foot of final grade, the subgrade or stone base course shall then be compacted and tested prior to commencement of proofrolling. The coverage areas and methods will be identified by the Owner's representative and/or geotechnical engineer. However, the roll shall be operated in a systematic manner so that the number of coverages over all areas to be proofrolled can be readily determined and recorded;
2. The equipment shall be operated at a speed that the geotechnical engineer can comfortably and slowly walk alongside the equipment;
3. If it becomes necessary to take corrective action, such as but not limited to underdrain installation, undercut and backfill of an unsuitable material, and aeration of excessively wet material in areas that have been proofrolled, see Article 3.3. These areas shall be proofrolled again following the completion of the necessary corrections. If the corrections are necessary due to the negligence of the Contractor or weather, the corrective work and additional proofrolling shall be performed by the Contractor at no cost to the Owner; and,
4. The Contractor shall protect all structural facilities on the project, such as but not limited to box culverts, pipe culverts, and utilities, from damage by the proofrolling equipment.

3.6 MAINTENANCE OF SUBGRADE

A. Finished subgrades shall be verified by the Contractor to ensure proper elevation and conditions for construction above subgrade.

B. Protect subgrade from excessive construction traffic and wheel loading including concrete and dump trucks.

C. Remove areas of finished subgrade judged to be unsatisfactory to the depth necessary and replace in a manner that will comply with compaction requirements by use of material equal to or better than the best subgrade material on site. Surface of subgrade after compaction shall be hard, uniform, smooth, stable, and true to grade and cross section.

3.7 FINISH ELEVATIONS AND LINES

A. For setting and establishing finish elevations and lines, secure the services of a licensed land surveyor acceptable to the Owner and engineer.

B. Provide elevation grade stakes and any other surveying necessary for the layout of the work. The Contractor shall conduct his work in such a manner that survey stakes will be protected as long as their need exists. Grade stakes, which are damaged or stolen, shall be replaced by the Contractor's surveyor at the Contractor's expense.

C. Graded areas shall be uniform, hard and smooth, free from rock, debris, or irregular surface changes. Any deviation shall not result in changes in drainage areas or ponding. All ground surfaces shall vary uniformly between indicated elevations. Finish drainage ditches shall be graded to allow for proper drainage without ponding and in a manner that will minimize the potential for erosion.

D. Correct all settlement and eroded areas for one year after date of project completion at no additional expense to Owner. Bring paved and landscaped areas to proper elevation. Replant or replace any grass, shrubs, bushes, or other vegetation disturbed by construction using corrective measures.

3.8 FIELD QUALITY CONTROL

A. The contractor shall coordinate all earthwork with the testing agency and geotechnical engineer to allow for inspection and testing. The geotechnical engineer shall provide full-time observation and testing of the compaction operations and provide documentation to the Owner.

B. Allow geotechnical engineer to inspect and test each subgrade and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. The geotechnical engineer shall test compaction of soils in place according to ASTM D 1556, ASTM D 1557, ASTM D 2167, ASTM D 2922, ASTM D 2937, and ASTM D 4254 as applicable. Tests shall be performed at the following locations and frequencies:

1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2,200 sq. ft. or less of paved areas or building slab, but in no case fewer than three tests.
2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench, but no fewer than two tests.
3. Structural Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench, but no fewer than two tests.

D. When the geotechnical engineer reports that subgrades, fills, or backfills have not achieved degree of compaction specified, recompact and retest until specified compaction is obtained.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off site to a regulated and permitted facility. Provide two copies of load manifest and permit from owner of the property where material is deposited.

END OF SECTION 310000

SECTION 321623 - SIDEWALKS

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes concrete paving for sidewalks

1.2 RELATED DOCUMENTS

A. Related Sections:
1. Section 310000 - Earthwork
2. Section 321116 - Subbase Course
3. Section 321600 – Concrete Curbs

1.3 REFERENCE STANDARDS

A. American Concrete Institute:
1. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.

B. Pennsylvania Department of Transportation (PennDOT):
1. PennDOT Publication 408/2020
2. PennDOT Bulletin No. 14: Aggregate Producers
3. PennDOT Bulletin No. 15: Qualified Products List for Construction

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data:

1. Submit required information regarding concrete materials, joint filler, admixtures, and curing compounds.
2. Mix Design:
   a. Submit concrete mix design for each concrete strength prior to commencement of Work.
   b. Submit separate designs if admixtures are required for hot- and cold-weather concrete Work.
   c. Identify mix ingredients and proportions, including admixtures.

3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.

C. Design Mixtures: For each concrete pavement mixture. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Source Quality-Control Submittals: Indicate results of shop tests and inspections.

F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

G. Qualifications Statement:

1. Submit qualifications for manufacturer and installer.

1.5 QUALITY ASSURANCE

A. Perform Work according to PennDOT Publication 408, Section 630 for curb and Section 704 for sidewalks.

B. Obtain cementitious materials from same source throughout.

C. Maintain copies of each standard affecting Work of this Section on Site.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.

B. Installer: Company specializing in performing Work of this Section with minimum three years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

B. Store materials according to manufacturer instructions.

C. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.8 AMBIENT CONDITIONS

A. Minimum Conditions: Do not place concrete if base surface temperature is less than 40 deg. F, or if surface is wet or frozen.

B. Subsequent Conditions: Maintain minimum 50 deg. F, for not less than 72 hours after placing, and at a temperature above freezing for remainder of curing period.

C. Schedule placement to minimize exposure to wind and hot sun before curing materials are applied.

D. Compliance Standards: ACI 305R and ACI 306R.

PART 2 - PRODUCTS

2.1 AGGREGATE SUBGRADE

A. As specified in Section 321116 - Subbase Course.

2.2 MATERIALS

A. Cement:

1. Comply with ASTM C150/C150M

B. Water:

1. Description: Potable

2. Comply with ASTM C94/C94M.

C. Admixtures:

1. Comply with ASTM C494/C494M.

D. Accessories:

1. Expansion Joint Material: PennDOT Publication 408, Section 705.1.

2. Cure: PennDOT Publication 408, section 711.2(a).

2.3 MIXES

A. Concrete Mix

1. Comply with ASTM C94/C94M.

2.4 SOURCE QUALITY CONTROL

A. Testing:

Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements.

B. Certificate of Compliance:

1. If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.

2. Specified shop tests are not required for Work performed by approved manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.

B. Verify that gradients and elevations of subgrade are as indicated on Drawings.

C. Notify Architect/Engineer minimum 24 hours prior to commencement of concrete operations.

3.2 PREPARATION

A. Clean formwork surfaces.

B. Clean previously placed concrete with steel brush and apply bonding agent.

3.3 INSTALLATION

A. Placement of Concrete:
   1. Place concrete continuously between predetermined construction and contraction joints.
   2. Do not interrupt successive placement.
   3. Test Panels:
      a. Prepare one mock-up panel at the project site to demonstrate proficiency of the contractor as well as determine the best procedures and degree of sand or aggregate exposure. Mock-up panels shall be minimum of 4’ x 4’. Contractor shall use the methods and materials proposed for use on the final installation. Uniformity in appearance of each panel shall be the responsibility of the contractor. The approved mock-up panel shall serve as a standard of appearance for the final work to be produced.
      b. Use test panels to determine when each section of Work is ready for exposed aggregate treatment.
   4. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surface and adjacent materials.

B. Curing:
   1. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
   2. Comply with ACI 306.1 for cold-weather protection and ACI 305 R for hot-weather protection during curing.
   3. 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.
   4. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
   5. Curing methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these methods.

3.4 FIELD QUALITY CONTROL

A. Strength Testing: As specified in Section 033000 - Cast-in-Place Concrete.

B. Acceptance:

1. Patch, cure, and finish imperfections to match adjacent areas.
2. Modify or replace concrete not conforming to indicated lines, details, and elevations, and to appearance requirements.
3. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this section.
4. 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 pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
5. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
6. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32162

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