SPECIFICATION FOR
PRECAST
PLATFORMS, PIER CAPS,
AND PLATFORM FOUNDATIONS
AT YARDLEY STATION

SPECIFICATION # F-S-15-29
DATE: December 2015
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01110 – SUMMARY OF WORK

This specification covers the materials, manufacture, handling, and shipping of precast reinforced concrete platform panels, pier caps, and foundations for Yardley Station on SEPTA’s Thorndale Line produced in accordance with the drawings and these specifications. Platform panels are to be delivered including plastic tactile edge and epoxy-modified acrylic logo.

END OF SECTION 01100
DIVISION 1 – GENERAL REQUIREMENTS
SECTION 01300 – ADMINISTRATIVE REQUIREMENTS

01320 – SCHEDULE

A. Submittals are due within thirty (30) calendar days after the contractor’s receipt of SEPTA’s Notice To Proceed.

B. The Fabricator shall allow 10 working days for review and processing by SEPTA following its receipt of submittals.

01330 – SUBMITTAL PROCEDURES

PART 1 – GENERAL

A. The Contractor shall not proceed with the procurement, manufacture, or fabrication of items submitted for review, until such submittals have been designated by the Project manager as “No Exceptions Taken” or “Proceed as Noted; Revise and Resubmit for Record” unless specifically authorized to do so by the Project Manager.

B. Review

1. Submittals will be reviewed by the SEPTA Structural Engineering Group. The results of review of submittals will have status as follows:
   - NO EXCEPTIONS TAKEN
   - PROCEED AS NOTED; REVISE AND RESUBMIT FOR RECORD
   - DO NOT PROCEED; REVISE AND RESUBMIT
   - REJECTED
   - NOT APPLICABLE

2. Review and Processing shall not relieve the Fabricator from responsibility for errors which may exist in the submitted data.

3. Submittals not in compliance with the Contract will be returned to the Fabricator for revision. Any loss of time and additional costs associated with resubmittal(s) shall be the Fabricator's responsibility.

4. Submittals that are "Proceed as Noted" are for the purpose of expediting procurement fabrication installation of the intended work. The Fabricator shall incorporate all corrections and resubmit to SEPTA original sepias and required copies of drawings within 30 days of the "Proceed as Noted" action.

PART 2 - PRODUCTS

1. Provide submittals per Sections 03400, 06602, and 09605.

PART 3 – (NOT USED)

END OF SECTION 01300
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This specification covers the design, materials, manufacture, handling, and shipping of precast reinforced concrete platform panels, pier caps, and foundations produced in accordance with the drawings and these specifications.

1.2 REFERENCES

Where applicable, the latest editions of the following standards shall be considered a part of these specifications. In case of conflict, these specifications shall take precedence over the listed standard. (See also Article 2.4, Concrete Materials)

A. American Concrete Institute (ACI)
   1. ACI 304 - Guide for Measuring, Mixing, Transporting and Placing Concrete
   2. ACI 318 - Building Code Requirements for Reinforced Concrete.
   3. ACI 117 – Standard Specifications for Tolerances for Concrete Construction and Materials

B. CRSI Manual of Standard Practice

C. American Society for Testing and Materials (ASTM):
   1. A36 Standard Specification for Carbon Structural Steel
   2. A185 Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete
   3. A615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
   5. C138 Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
   8. C173 Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
   9. C192 Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
   10. C231 Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
   12. C31 Standard Practice for Making and Curing Concrete Test Specimens in the Field
   13. C33 Standard Specification for Concrete Aggregates
   15. C39 Test Method for Compressive Strength of Cylindrical Concrete Specimens
   16. C494 Specification for Chemical Admixtures for Concrete
   17. C618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
   19. C979 - Standard Specification for Pigments for Integrally Colored Concrete
21. C1017 Specification for Chemical Admixtures for Use in Producing Flowing Concrete
23. D257 Test Methods for DC Resistance or Conductance of Insulating Materials

D. American Welding Society (AWS):
   1. AWS D1.1 Structural Welding Code – Steel
   2. AWS D1.4 Structural Welding Code – Reinforcing Steel

E. Precast/Prestressed Concrete Institute (PCI): PCI MNL 117 Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products

F. National Precast Concrete Association (NPCA): Quality Control Manual

1.3 SUBMITTALS

A. Shop Drawings - The shop drawings for custom-made precast concrete units shall be furnished by the precast concrete Fabricator for approval by SEPTA. Reproduction of Contract Drawings will not be accepted as a shop drawing submission. Details of steel reinforcement size and placement shall be included. The drawings shall include a schedule, which will list the size and type of precast concrete units. The precast concrete units shall be produced in accordance with the approved drawings.

B. Submit concrete design mix(es) along with associated product data, material test data, mill reports, and certifications for review and approval.

C. Data sheets for embedded lifting devices with supporting design calculations along with design of the units for stresses associated with lifting and handling. Embedded lifting lugs shall be rated for not less than 150% of the calculated load/weight.

D. Quality Plan: In compliance with applicable requirements of the contract, the Fabricator shall provide a quality control plan to ensure uniformity of materials, conformance with accepted mix designs, and compliance with these Specifications. Provide records of all material testing as well as final dimensions and weights of each unit.

E. Certificates: Submit for information only.
   1. Submit evidence of current plant certification under the PCI Plant Certification Program, approval by the International Conference of Building Officials (ICBO), NPCA Certification, and/or PennDOT certification prior to and during production of the products for this project.
   2. Submit fabricators' certifications of compliance for materials as required by PCI MNL-117.
   3. For welders, furnish welding certificates or affidavits attesting to the welders' qualifications to perform the indicated and specified welding. Welders shall be prequalified in accordance with AWS D1.1 or AWS D1.4, as applicable to the work.

1.5 QUALITY ASSURANCE

A. Precast concrete Fabricator shall demonstrate adherence to the standards set forth in the National Precast Concrete Association Quality Control Manual. Alternately, the fabricator of precast concrete
products shall be an active and approved participant in the PCI Plant Certification Program, an ICBO-approved precast fabricator, or a PennDOT approved precast fabricator for custom fabrications.

B. Precast concrete work shall be produced in a plant or production facility by a fabricator who has been regularly and continuously engaged in the manufacture of precast concrete products. The Precast concrete Fabricator shall have been in the business of producing precast concrete products similar to those specified for a minimum of 5 years. The precast concrete Fabricator shall maintain a permanent quality control department or retain an independent testing agency on a continuing basis. The agency shall issue a report, certified by a licensed engineer, detailing the ability of the precast concrete Fabricator to produce quality products consistent with industry standards.

C. Fabricator shall have sufficient production capacity to produce the required units without causing any delay in the work.

D. Tolerances: Fabricate precast concrete members within the specified tolerances.

E. Testing and Inspection
   1. The Fabricator shall employee an independent testing laboratory or agency to perform such inspections and tests as required to verify compliance with these Specifications. All such inspections and tests shall be conducted at no additional cost to SEPTA.
   2. The Precast concrete Fabricator shall provide documentation demonstrating compliance with the quality control program and the QA requirements of the Contract Documents.
   3. SEPTA may place an inspector in the plant when the products covered by this specification are being manufactured. SEPTA reserves the right to reject any unit that does not conform to the specifications and drawings.
   4. All testing and inspection records shall be provided to SEPTA prior to request for final payment.

F. Fabricator shall piece mark all units.

1.6 DELIVERY, STORAGE AND HANDLING

A. Handling - Products shall be stored, handled, shipped and unloaded in a manner to minimize damage. Lifting holes or inserts shall be consistent with industry standards. Lifting shall be accomplished with methods or devices intended for this purpose.

B. Store units in a manner which will prevent cracking, distortion, staining, or other damage. Support members at their normal support points.

C. Acceptance at Site - SEPTA’s representative shall make final inspection and acceptance of the precast concrete products upon arrival and off loading at the jobsite.

PART 2 - MATERIALS

2.1 FABRICATORS

A. The precast concrete fabricator must meet the guidelines written in Article 1.5 Paragraphs A, B, and C.
2.2 MANUFACTURED PRECAST UNITS

A. Precast Concrete: Provide all units shown in Contract Documents and as needed for a complete and proper installation.

B. Design Criteria - Design units in accordance with:
   - ACI 304 and 318.
   - Applicable ASTM Standard(s).

C. Finishes
   1. Formed non-architectural surfaces: Surfaces cast against approved forms using industry practice in cleaning forms, designing concrete mixes, placing and curing concrete. Normal color variations, form joint marks, small surface holes caused by air bubbles, and minor chips and spalls will be tolerated but no major imperfections, honeycombs or other defects will be permitted.
   2. Unformed surfaces: Surfaces finished with a vibrating screed, or by hand with a float. Normal color variations, minor indentations, minor chips and spalls will be tolerated but no major imperfections, honeycombs, or other defects shall be permitted.
   3. Bearing surfaces shall have a form or steel trowel finish.
   4. Special finishes:
      a. Platform panels shall have out-door type finish that withstands deicing chemicals and freeze-thaw conditions.
      b. Platform units shall have slope on the top surface as shown on the drawings.
      c. Units shall have architectural pattern as shown on drawings.
      d. Platform walking surfaces shall be non-slip abrasive finish (medium broom) perpendicular to walking direction, ADA compliant and performed as per industry standards and supplier specifications.
      e. Top of footing of pier foundations and top and bottom of pier caps shall have smooth steel trowel finish and performed per industry standards.
      f. Precast concrete fabricators shall submit finishes for approval by SEPTA.

D. The top and sides (exposed surfaces) of the precast platforms shall be coated with a poly-siloxane sealer, Sikaguard 701W® or approved equal, applied in accordance with the manufacturer’s written instructions.

E. Patching and Repairs
   1. No repair is required to formed surfaces that are relatively free of air voids and honeycombed areas, unless the surfaces are required by the design to be finished.
   2. Repairing Minor Defects - Defects that will not impair the functional use or expected life of a manufactured precast concrete product may be repaired by any method that does not impair the product.
   3. Repairing Honeycombed Areas - When honeycombed areas are to be repaired, all loose material shall be removed and the areas cut back into essentially horizontal or vertical planes to a depth at which coarse aggregate particles break under chipping rather than being dislodged. Proprietary repair materials shall be used in accordance with the manufacturer’s instructions. If a proprietary repair material is not used, the area shall be saturated with water and, immediately prior to repair, the area should be damp, but free of excess water. A cement-sand grout or an approved bonding agent shall be applied to the chipped surfaces, followed immediately by consolidating an appropriate repair material into the cavity.
4. Repairing Major Defects - Defects in precast concrete products which impair the functional use or the expected life of products shall be evaluated by qualified personnel and SEPTA to determine if repairs are feasible and, if so, to establish the repair procedure. SEPTA reserves the right to reject precast concrete products with major defects which impair the functional use or the expected life of regardless of the evaluation by qualified personnel. All repairs of major defects require SEPTA approval and acceptance prior to proceeding with the repair and upon completion of the repair. Color and texture differences between and with-in units is considered as a major defect.

2.3 MATERIALS

A. Concrete - Concrete shall be a uniform mix of quality materials listed in Article 2.3. Mix proportions shall be determined by following the standards in ACI 318 Chapters 4 and 5. Recommendations for selecting proportions for concrete are given in detail in Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete (ACI 211.1).
   1. Compressive Strength: minimum compressive strength of 5,000 psi in 28 days
   2. Water-Cement Ratio: 0.40 or less.
   3. Air Content: The air content of concrete shall be within the limits given in Table 1.

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<th>Air Content %</th>
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<td>7.5</td>
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<td>1-1/2</td>
<td>6.0</td>
<td>5.0 to 7.0</td>
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B. Portland Cement: ASTM C150, Type I/II or II

C. Aggregates: ASTM C33.

D. Water: Potable or free of deleterious substances in amounts harmful to concrete or embedded metals.

E. Admixtures:
   1. Air-entraining: ASTM C260
   2. Water reducing, retarding, accelerating, high range water reducing: ASTM C494
   3. Pozzolans, fly ash and other mineral admixtures: ASTM C618
   4. Ground granulated blast furnace slag: ASTM C989
   5. Pigments: Non-fading and lime-resistant

2.4 REINFORCEMENT AND CONNECTION MATERIALS

A. Provide all reinforcement, accessory and connection materials required. Concrete reinforcement shall be steel bars or welded wire fabric, or a combination thereof as shown on the contract drawings.

B. Reinforcement Bars, Wire, and Fabric: epoxy coated or galvanized
   1. Reinforcement Bars - Deformed, ASTM A615 Grade 60, epoxy coated
   2. Tie Wire - Epoxy Coated
   3. Welded Wire Fabric Reinforcement: ASTM A185, epoxy coated
PART 2 - DESIGN

C. Inserts and Embedded Metal - All items embedded in concrete shall be of the type required for the intended task, and meet the following standards:
1. Proprietary items: In accordance with manufacturers published literature, hot dip galvanized or stainless steel
2. Welded studs: AWS D1.1 Type B, ASTM A108 material

D. Embedded conduit shall be rigid PVC or HDPE, UL Listed, complying with the National Electric Code, latest edition.

2.5 TACTILE WARNING SURFACES

A. See Section 06602 Flat Plastic Detectable Warning Tile.

2.6 CONCRETE LOGOS

A. See Section 09605 Concrete Logos

PART 3 - EXECUTION

3.1 FABRICATION

A. Forms for manufacturing precast concrete products shall be of the type and design consistent with industry standards. They should be capable of consistently providing uniform products and dimensions. Forms shall be constructed so that the forces and vibrations to which the forms will be subjected can cause no product damage.
1. Forms shall be cleaned of concrete build-up after each use.
2. Form release agents shall not be allowed to build up on the form casting surfaces.

B. Reinforcement: - Cages of reinforcement shall be fabricated either by tying the bars, wires or welded wire fabric into rigid assemblies or by welding where permissible in accordance with AWS D1.4, shown on the contract drawings, or authorized in writing by the Engineer. Reinforcing shall be positioned as specified by the design and so that the concrete cover conforms to requirements. The tolerance on concrete cover shall be one-third of that specified but not more than 1/2 in. Concrete cover shall not be less than 1-1/2 in. Positive means shall be taken to assure that the reinforcement does not move significantly during the casting operations.

C. Embedded Items: - Embedded items shall be positioned at locations specified in the design documents. Inserts, plates, weldments, lifting devices and other items to be imbedded in precast concrete products shall be held rigidly in place so that they do not move significantly during casting operations.

D. Anchors, Lift Devices, and Accessories: Provide embedments, concrete inserts, reglets, anchors, brackets, and fasteners as indicated or required for fabrication and installation work. All metallic items shall be stainless steel or hot dip galvanized in accordance with ASTM A153 or ASTM A123, as applicable. Fabricator shall select the lift devices, and shall be responsible for their performance and for any damage resulting from the use of faulty or inferior devices. Lift devices shall not be visible on
exposed faces of precast members. As a minimum, two (2) sets of lifting hooks matching embedded lifting devices shall be provided to SEPTA.

E. Markings: Imprint the date of casting and type designation on each precast unit where it will not show in the finished structure.

F. Placing Concrete
   1. Concrete shall be deposited into forms as near to its final location as practical. The free fall of the concrete shall be kept to a minimum. Concrete shall be consolidated in such a manner that segregation of the concrete is minimized and honeycombed areas are kept to a minimum. Vibrators used to consolidate concrete shall have frequencies and amplitudes sufficient to produce well-consolidated concrete.
      • Cold Weather Requirements - Recommendations for cold weather concreting are given in detail in Cold Weather Concreting reported by ACI Committee 306.
      • Adequate equipment shall be provided for heating concrete materials and protecting concrete during freezing or near-freezing weather.
      • All concrete materials and all reinforcement, forms, fillers, and ground with which concrete is to come in contact shall be free from frost.
      • Frozen materials or materials containing ice shall not be used.
      • In cold weather the temperature of concrete at the time of placing shall not be below 45° F. Concrete that freezes before its compressive strength reaches 500 psi shall be discarded.

   2. Hot Weather Requirements - Recommendations for hot weather concreting are given in detail in Hot Weather Concreting reported by ACI Committee 305. During hot weather, proper attention shall be given to ingredients, production methods, handling, placing, protection, and curing to prevent excessive concrete temperatures or water evaporation that could impair required strength or serviceability of the member or structure. The temperature of concrete at the time of placing shall not exceed 90° F.

G. Curing - Moisture shall be prevented from evaporating from exposed surfaces until adequate strength for stripping is reached by one of the following methods:
   1. Cover with burlap or other absorptive material and keep continually moist. Surfaces shall be cured as above a minimum of 3 days. Forms shall be considered effective in preventing evaporation from the contact surfaces. If air temperature is below 50°F the curing period shall be extended.

   2. Curing with Heat and Moisture - Concrete shall not be subjected to steam or hot air until after the concrete has attained its initial set. Steam, if used, shall be applied within a suitable enclosure, which permits free circulation of the steam. If hot air is used for curing, precautions shall be taken to prevent moisture loss from the concrete. The temperature of the concrete shall not be permitted to exceed 160° F. These requirements do not apply to products cured with steam under pressure in an autoclave.

H. Stripping Products from Forms - Products shall not be removed from the forms until the concrete reaches the compressive strength for stripping required by the design. If no such requirement exists, products may be removed from the forms after the final set of concrete provided that stripping damage is minimal.

I. Shipping Products - Products shall not be shipped until they are at least 5 days old, unless it can be shown that the concrete strength has reached at least 75% of the specified 28-day strength, the
3.2 QUALITY CONTROL

A. Fabricate units in accordance with ACI 318 and the National Precast Concrete Association’s Quality Control Manual for Precast Plants or PCI MNL 117 Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products.

B. The Precast concrete Fabricator shall show that the following tests are performed in accordance with the ASTM standards indicated. Tests shall be performed prepared for every twenty precast units, or fraction thereof, cast in any one day.
   - Slump: C143
   - Compressive Strength: C31, C192, C39
   - Air Content: C231 or C173
   - Unit Weight: C138

C. Concrete shall be tested for compressive strength as specified above. A set of seven cylinders shall be prepared for every twenty precast units, or fraction thereof, cast in any one day. Two cylinders shall be tested at 3 days, two cylinders at 7 days, two cylinders at 28 days, and one cylinder shall be retained for further testing as may be required. Cylinders shall be prepared and moist cured in accordance with ASTM C31, and tested in accordance with ASTM C39.

3.3 TOLERANCES

A. Fabricate units to the tolerances specified in the National Precast Concrete Association’s Quality Control Manual for Precast Plants, PCI MNL 117 Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products, ACI 117, or as noted below, whichever is the most stringent:

B. Fabricator may batter vertical (interior only) sides of the precast beams a maximum of 1:12 with approval by SEPTA

C. Tolerances:
   1. Length and width of member: 1/16 inch
   2. Lateral alignment (sweep) of surfaces relative to the centerline of the unit: 1/8 inch
   3. Lateral alignment of embedded items and sleeves: 1/8 inch
   4. Alignment of architectural pattern, vertically and horizontally: 1/8”
   5. Surface irregularities, deviation from a 10 foot straight edge: 1/8 inch
   6. Cross-sectional dimensions:
      - 6 inches or less: 1/8 inch
      - over 6 inches and less than 18 inches: 3/16 inch
      - over 18 inches but less than 36 inches: ¼ inch
   7. Straightness of meeting edges: deviation from 10 foot straight edge: 1/8 inch.
   8. Stair treads and risers shall be of uniform size and shape. The tolerance between the largest and smallest riser height or between the largest and smallest tread depth shall not exceed 3/8 inch.

3.5 DELIVERY

A. Site Access – Access to the site shall be coordinated through SEPTA.
B. The fabricator shall be responsible for transport of the precast concrete units to the designated location as identified by SEPTA in the contract documents, in accordance with industry standards, federal, state and local regulations, and as specified herein.

C. Maintain precast concrete unit in upright position at all times. Handle unit only by indicated lifting devices or cushioned pads, and in a manner which will not overstress or damage the unit.

3.6 INSTALLATION

A. Off-loading and installation will be by others.

3.7 PROJECT CLOSEOUT

A. All material certification, inspection records, material testing records, and other required documentation shall be provided to SEPTA prior to request for final payment.

END OF SECTION 03400
PART 1 - GENERAL

1.01 DESCRIPTION

A. This section specifies the manufacture and installation of Plastic Detectable Warning Tile on Precast Concrete Platform panels that meets both the latest editions of the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and ANSI A117.1 codes.

B. The supplier shall provide a complete installation, including but not necessarily limited to Plastic Detectable Warning Tile, Adhesive, and Stainless Steel Fasteners including Plastic Fastener Caps.

C. Installed tactile shall be removable for future maintenance.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer’s literature describing products, installation, procedures, and routine maintenance.

B. Samples: Submit 12” x 12” minimum size samples of detectable warning surface tile, including anchorage component, of the kind proposed for use.

C. Material Test Reports: Submit test reports from qualified independent testing laboratory indicating that materials proposed for use are in compliance with all specification requirements and that both the coefficient of slip resistance and dome layout meets and or exceeds those recommended by both the latest editions of ADAAG and ANSI codes.

D. Shop Drawings: Submit standard Shop Drawings indicating installation method and layout.

1.03 QUALITY ASSURANCE & CODE COMPLIANCE

A. Manufacturer: Provide adhesives and fasteners that are compatible and approved to be used with the Flat Plastic Detectable Warning Tile.

B. Warranty: The manufacturer shall warranty the material and the system for a period of ten (10) years from the date of substantial completion. This warranty shall cover the material and the system from failure including color fade, hazing, cracking, and fiber bloom.

C. Truncated dome size, profile, spacing, and layout shall match those specified in both the latest editions of ADAAG and ANSI A117.1 (Alignment: Truncated domes shall be aligned in a Square Grid Pattern).

D. Fasteners shall be 304 Stainless Steel and shall be tested to assure compliance. Vendor shall provide clear documentation confirming the grade of the stainless steel fasteners.
E. Fire Performance Testing and Approvals:

1. "Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering, and Miscellaneous Materials". Flame spread and smoke developed of tile adhered to 1/4" fiberglass reinforced cement board not to exceed 15 flame spread and 275 smoke developed when tested per ASTM E84.

2. "Specific Optical Density of Smoke Generated by Solid Materials". The smoke density of tile adhered to 1/4" fiberglass reinforced cement board not to exceed specified values in compliance with the U.S. Department of Transportation Urban Mass Transportation Guidelines. These are less than 100 DS 1.5 and Less than 200 DS 4.0 when tested per ASTM D662.

3. "Toxic Gas Generation". Toxic gas generation of tile adhered to 1.4" fiberglass reinforced cement board not to exceed the following Specified values in compliance with the U.S. Department of Transportation Urban Mass Transportation Guidelines: Boeing BSS 7239 - Requirements: Products of combustion are to be less than the Specified maximum for CO, HCN, HCl, HF, HBr, SO,

4. "Critical Radiant Flux of Floor Covering System Using a Radiant Heat Energy Source". Critical radiant flux of tile adhered to 1/4" fiberglass reinforced cement board not to be less than the following Specified value: ASTM E648 - Requirement: >1.10 w/cm\(^2\)

5. Detectable warning surface tile shall meet or exceed the following test criteria:
   a. Dimensions of tile to be held within the following dimensions and tolerance:
      Length & Width: 48.000" x 24.000"+-0.6% max.
      Thickness: 0.375" +/-5% max.
      Edge Warp: +/-0.5% max.
   b. Water Absorption, ASTM D 570: 0.07% max.
   c. Slip Resistance, ASTM C 1028: 0.80 min.
   d. Compressive strength, ASTM D 695: 28,000 psi min.
   e. Tensile Strength, ASTM D 638: 11,000 psi min.
   f. Flexural Strength, ASTM D 790: 25,000 psi min.
   g. Salt and Spray Performance, ASTM B 117: No deterioration after 200 hours of exposure.
   h. Abrasion Resistance, ASTM C 501: 300 min.
   i. Chemical Stain Resistance of tile when tested by ASTM D2299 shall exhibit no discoloration or staining to bleach solution, turpentine, iron oxide, ethane, soap solution, hydraulic oil, motor oil, carbon black, calcium chloride, and ethylene glycol.
   j. Fire Resistance of Tile when tested to ASTM E 84-05 flame spread be less than 15.

1.04 DELIVERY, STORAGE, AND HANDLING
A. Detectable warning surface tiles shall be delivered installed onto platform panels.

1.05 JOB CONDITIONS

A. Environmental conditions and protection: Maintain the ambient temperature at 40° F or above during installation and curing.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Vitrified Polymer Composite (VPC) Surface Applied Detectable/Tactile Warning as manufactured by:

- Armor-Tile, 300 International Drive, Suite 100, Williamsville, NY 14221 (800-682-2525),
- ADA Solutions, INC, P.O. Box 3, North Billerica, MA 01862 (800-372-0519)
- or approved equal.

1. Size: VPC tiles shall be nominally 48" x 24" with a thickness not less than 3/8" or greater than 1/2". Color shall be “Safety Yellow” conforming to Federal Color No. 33538. Color shall be homogeneous throughout the tile.

2. Dome Spacing:

- Size – Truncated domes shall have a base diameter of 0.9 inch minimum to 1.4 inch maximum to 65 percent maximum of the base diameter.
- Height – Truncated domes shall have a height of 0.2 inch.
- Spacing – Truncated domes shall have a center to center spacing of 1.6 inches minimum and 2.4 inches maximum, and a base-to-base spacing of 0.65 inch minimum, measured between the most adjacent domes on the grid.
- Alignment – Truncated domes shall be aligned in a square grid pattern.

3. Profile: Detectable Warning Tile shall be flat and without flanges or sloped beveled edges (45 degree slope at edge is acceptable as long as slope distance is not greater than \( \frac{1}{4} \)”). Kerf cuts shall not be required. When panel is laid flat warping shall not be evident.

B. Setting, Grouting, and Mechanical Fastener Materials:

1. Heavy duty white elastomeric polyurethane adhesive "ULTRA SET" as manufactured by Mapei, Bostik, or ADA ChemLink M1 Adhesive or approved equal.

2. Joint Sealant shall be BASF NP1 or Sikaflex 1A or approved equal.

3. Stainless Steel Pin Bang Rivets, 1/4-inch x 1 1/2-inches, to be positioned in the molded recess of a minimum fifteen (15) truncated domes per tile positioned at both the perimeter and interior of each tile.
a. Type: 304 Stainless steel.

4. Vitrified Polymer Composite (VPC) truncated dome caps to be press fit and bonded into fifteen (15) corresponding truncated domes

PART 3 - EXECUTION

3.01 SHIPPI NG AND HANDLIN G

A. Shipping Location

1. Ship all components to a SEPTA location as identified in the purchase document. Coordinate the shipping date and time with the assigned Project Construction Manager as identified on the Purchase Order.

END OF SECTION 06602
PART 1 – GENERAL

1.01 Description

A. The work of this section consists of the installation of epoxy-modified acrylic logos on precast concrete platform panels.

B. The Contractor shall be responsible for all materials, labor, storage and equipment. This shall include but not necessarily be limited to supplying and cutting all stencils, and installation.

1.02 Submittals

A. The Contractor shall provide the following:
   1. Manufacturer’s product literature for logo
   2. MSDS Sheets for all chemicals to be used
   3. Shop Drawings:
      a. ¼”=1'-0" Layout Plan showing exact installation areas.
      b. Full Scale Production Sample (on paper) of stencil
   4. Large scale detail of material thicknesses on concrete

1.03 Quality Control

A. Upon SEPTA’s request, the Contractor shall submit a list of a minimum of 3 projects using the specified materials that he or she has completed. Information shall include: project name, square footage, owner contact name, owner’s contact phone number, address and email address.

B. Work shall be completed by an installer that is accredited by the logo manufacturer to perform the work and offer a product warranty.

C. Installer must be approved, authorized, or licensed to warranty product for a minimum of one year following installation.

1.04 Delivery, Storage and Handling

A. Store all materials in accordance with manufacturer’s instructions, with seals and labels intact and legible. Do not use materials which exceed the manufacturer’s maximum recommended shelf life.

1.05 Warranty

A. The Contractor shall correct, at his or her own expense, any defects in the work including peeling, delamination, or abnormal wear within one year from the date of installation.

B. Contractor shall repair defective areas by repairing or replacing concrete if a suitable repair is not feasible, and recoating the affected area.

C. In case of a warranty claim, the contractor will have 60 days after being notified by SEPTA to complete the repair work. SEPTA will provide access to the site for warranty repairs. Work will be coordinated around train operations.

PART 2 – PRODUCTS
## Materials

### Physical Properties:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Quantity</th>
<th>Test Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solids by Volume</td>
<td>53.712%</td>
<td>ASTM D-2697</td>
</tr>
<tr>
<td>Solids by Weight</td>
<td>71.020%</td>
<td>ASTM D-2369</td>
</tr>
<tr>
<td>Density</td>
<td>13.27 lbs/gal</td>
<td>ASTM D-1475</td>
</tr>
</tbody>
</table>

### Performance Properties

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Quantity</th>
<th>Test Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry time (time to re-coat)</td>
<td>35 min</td>
<td>ASTM D-5895, 23° C; 37% RH</td>
</tr>
<tr>
<td>Taber Wear Abrasion Dry H-10 wheel</td>
<td>0.760g/1000 cycles</td>
<td>ASTM D-4060, 1 day cure</td>
</tr>
<tr>
<td>Taber Wear Abrasion Wet H-10 wheel</td>
<td>1.670g/1000 cycles</td>
<td>ASTM D-4060, 7 days cure</td>
</tr>
<tr>
<td>QUV Accelerate Weathering Environment</td>
<td>0.53 (Brick)</td>
<td>ASTM G-151, (\Delta E) 1,500hrs</td>
</tr>
<tr>
<td>Hydrophobicity Water Absorption</td>
<td>11.945%</td>
<td>ASTM D-570</td>
</tr>
<tr>
<td>Shore Hardness</td>
<td>38.3</td>
<td>ASTM D-2240</td>
</tr>
<tr>
<td>Mandrel Bend</td>
<td>(\frac{3}{8}&quot; @ 21° C</td>
<td>ASTM D522-93A</td>
</tr>
<tr>
<td>Permeance</td>
<td>3.45g/m²/ 24hr/mmHg</td>
<td>ASTM D-1653</td>
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<tr>
<td>VOC</td>
<td>19.14%</td>
<td>Per MSDS</td>
</tr>
<tr>
<td>Adhesion</td>
<td>Substrate Failure</td>
<td>ASTM D-4541</td>
</tr>
</tbody>
</table>

### Color

1. Highly concentrated, high quality, UV stable pigment blend.
   a. Color: Black lettering within marigold rectangle.

### Application equipment

1. Use equipment designed by the manufacturer for the specific intended application.

### Recommended System:

*StreetBond* by Quest Construction Products.

**Contact**

Rod Kuhns  
Pavement Impressions, Inc.  
3062 Schoenick Rd  
Macungie, PA 18062  
(610) 481-0300

## PART 3 – EXECUTION

### 3.01 Surface Preparation

A. The platform surface shall be dry and free from all foreign matter, including but not limited to dirt, dust, de-icing materials, and chemical residue.

### 3.02 Lettering

A. “WATCH THE GAP” shall be eight inches high and ten feet wide surrounded by a 10 inch high and 10'-2" wide rectangle.
A. Follow manufacturer’s installation instructions for application onto concrete surfaces.
B. Apply logos only when the air temperature is 50°F and rising and will not drop below 50°F within 24 hours. No precipitation should be expected within 24 hours.
C. Coating and Coverage. Apply 3 layers at 600 SF per 5 gallon unit for a net coverage of 200 SF per 5 gallon unit.

3.04 Protection

A. Coating must be 100% dry and sufficient curing time (per the manufacturer) must be allowed before traffic is permitted on the surface.

END OF SECTION 09605