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VIA WEBSITE POSTING

June 24, 2015

Contract No. T200612502.01
FTA Federal Number 5311-2006 (01)
Lewes Park and Ride & Maintenance Facility
Sussex County

Ladies and Gentlemen:

Enclosed is Addendum No. 4 for the referenced contract consisting of the following:

1. Ten (10) pages, Special Provisions, 501532 - Pervious Portland Cement Concrete, pages 65 through 67, revised, to be substituted for the same pages in the Proposal and pages 67A through 67G, new, to be added to the Proposal.

2. One (1) page, Appendix A, Technical Specifications, Section 075323 - Ethylene - Propylene-Diene-Monomer (EPDM) Roofing, page 075323 - 4, revised, to be substituted for the same page in the Proposal.

3. One (1) page, Appendix A, Technical Specifications, Section 084113 - Aluminum-Framed Entrances and Storefronts, page 084113 - 7, revised, to be substituted for the same page in the Proposal.

4. One (1) page, Appendix A, Technical Specifications, Section 131200 - Modular Restrooms, page 131200 - 8, new, to be added to the Proposal.

5. Two (2) sheets, Construction Plans, sheets 84 and 181, revised, to be substituted for the same sheets in the Plan Set.

Please note the revisions listed above and submit your bid based upon this information.

Sincerely,

signature on file

James H. Hoagland
Contract Services Administrator

:jhh
Enclosures

501532 - PERVIOUS PORTLAND CEMENT CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Specification provides requirements for the construction of pervious concrete pavement for parking lots as specified in the Contrract Documents or as directed by the Engineer.

1.2 SUBMITTALS

A. Contractor shall submit the following in accordance with THE General Provisions:

1. Qualifications of Contractor as specified in 1.05.B.
2. Proposed concrete mixture proportions with density and void content of freshly mixed pervious concrete per ASTM C1688/C1688M.
3. In-place pavement test results from previous work, completed in the last 24 months, including density and void content of freshly mixed pervious concrete, mixture proportions, thickness, density and void content of cores extracted from the pavement, if tested, when required by the Engineer.
4. Reports covering the source and quality of concrete materials.
5. Two test panels, as described in 1.05.E.2, shall be placed, jointed, and cured; each a minimum of 225 square feet and being within tolerance of the required thickness defined by Contract Documents. The required information to be submitted from the test panels shall be: density of the fresh concrete, length of cores, and density of cores. The test panels will be done by the actual staff that will be installing the pervious concrete on the site. The concrete for the test panels will be from the actual concrete supplier that will be providing the pervious concrete for the site. The test panels must be approved by the Engineer.
6. Jointing plan and placing sequence, if proposed alternatively to the Contract Documents. Where no jointing and placing plan/sequence is included in the Contract documents, the Contractor shall have the responsibility of developing and submitting to the Engineer for approval, a placing plan and sequence clearly describing the size of the pervious concrete panels, their layout and the sequence in which they are to be placed. The Contractor shall have the responsibility of developing this plan and sequence such that the pervious concrete can be placed within the required time frame from hydration specified in 3.4.A. The Contractor shall have the responsibility of accounting for batching and delivery time in the development of the placing plan and sequence.
7. When hot weather is anticipated, submit detailed procedures for the production, transportation, placement, protection, curing, and temperature monitoring of concrete during hot weather.
8. In cold weather, submit detailed procedures for the production, transportation, placement, protection, curing, and temperature monitoring of concrete.
9. Qualifications of testing agency as specified in 1.05.C.
10. The Contractor shall submit the mixture design at least 30 days prior to use to the Architect/engineer for review and approval.

1.3 DEFINITIONS

A. *acceptable or accepted*-determined to be satisfactory by the Engineer.

B. *acceptance*-acknowledgment by the Engineer that submittal or completed Work is acceptable.

C. *Contract Documents-a* set of documents supplied by owner to bidders during bidding phase of a construction project, These documents include general requirements, contract forms, contract conditions, specifications, drawings, and addenda.

D. *Contractor*-the person, firm, or entity under contract for construction of the Work.

E. *construction joint*-the surface where two successive placements of concrete meet, across which it may be desirable to achieve bond.

F. *contraction joint*-formed, sawed, or tooled groove in a concrete structure to create a weakened plane

to regulate the location of cracking.

G. *design void content*-the percentage of voids of a unit volume of pervious concrete based on the theoretical mixture proportions and design density and where the unit volume includes the volume of the solids and the voids.

H. *early-entry dry*-cut saw-a tool designed to produce joints in concrete commencing 1 to 4 hours after finishing.

I. *hardened density*-the dry density of pervious concrete as determined by Paragraphs 8.3 and 9.3 of ASTM C140-12.

J. *hydration*-stabilizing admixtures-set-retarding admixtures, conforming to ASTM C494/C494M Type B or D, that can predictably reduce the hydration rate of cement for applications requiring the management of time of setting of returned concrete, reducing the hydration rate of cement fines in water from concrete production, or for applications requiring extended delivery time of ready mixed concrete.

K. *isolation joint*-a normally vertical interface allowing relative movement without transferring sufficient tension, compression, or traction forces to negatively affect the performance of a pavement structure.

L. *Owner*-the corporation, association, partnership, individual, public body, or authority for whom the Work is constructed.

M. *panel*-a concrete element that is relatively thin with respect to other dimensions and is bordered by joints or edges.

N. *permitted*-accepted by or acceptable to the Engineer, usually pertaining to a request by Contractor, or when specified in Contract Documents.

O. *pervious pavement*-a pavement comprising material with sufficient continuous voids to allow water to pass from the surface to the underlying layers.

P. *Project Drawings*-graphic presentation of project requirements.

Q. *Project Specification*-written document that details requirements for the Work in accordance with service parameters and other specific criteria.

R. *referenced standards*-standardized mandatorylanguage documents of a technical society, organization, or association, including codes of local or state authorities, which are incorporated by reference in Contract Documents.

S. *subbase*-the layer in a pavement system between the subgrade and the base course, or between the subgrade and a pervious concrete pavement.

T. *submittal*-document or material provided to the Engineer for review and acceptance.

U. *Work*-the entire construction or separately identifiable parts thereof required to be furnished under Contract Documents.

1.4 REFERENCED STANDARDS

A. Standards of ACI and ASTM referred to in this specification are listed with serial designation including year of adoption or revision, and are part of this specification.
   1. American Concrete Institute (ACI) Standards
      a. 306.1-90-Standard Specification for Cold Weather Concreting
   2. ASTM International
      a. C42/C42M-13-Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
      b. C94/C94M-13-Standard Specification for Ready Mixed Concrete

c. C140-12-Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
d. C150/C150M-12-Standard Specification for Portland Cement
e. C171-07-Standard Specification for Sheet Materials for Curing Concrete
f. C172/C172M-10-Standard Practice for Sampling Freshly Mixed Concrete
g. C174/C174M-12-Standard Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores
h. C260/C260M-10-Standard Specification for Air-Entraining Admixtures for Concrete
i. C494/494M-12-Standard Specification for Chemical Admixtures for Concrete
j. C595/595M-13-Standard Specification for Blended Hydraulic Cements
k. C618-12-Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
l. C979/C979M-10-Standard Specification for Pigments for Integrally Colored Concrete
m. C989/C989M-12a-Standard Specification for Slag Cement for Use in Concrete and Mortars
n. C1017/C1017M-07-Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
o. C1077-13-Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
p. C1116/C1116M-10-Standard Specification for Fiber-Reinforced Concrete
q. C1157/1157M-11-Standard Performance Specification for Hydraulic Cement
r. C1240-12-Standard Specification for Silica Fume Used in Cementitious Mixtures
s. C1688/C1688M-13-Standard Test Method for Density and Void Content of Freshly Mixed Pervious Concrete
t. D994/D994M-11-Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)
u. C1602 - Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
v. D1751-04(2008)-Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
w. D1752-04(2008)-Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
x. D3385-09-Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer
y. D3665-12-Standard Practice for Random Sampling of Construction Materials
z. E329-11-Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

1.5 QUALITY CONTROL

A. General-Test and inspect concrete materials and operations as Work progresses as described in 1.05.F. Failure to detect defective Work or material at any time will not prevent rejection if a defect is discovered later, nor shall it constitute final acceptance.

B. Contractor-Employ no less than one National Ready Mixed Concrete Association (NRMCA) certified Pervious Concrete Craftsman who must be on site, overseeing each placement crew during all concrete placement, or employ no less than three NRMCA Certified Pervious Concrete Installers, who must be on site working as members of each placement crew during all concrete placement, unless otherwise specified. The minimum number of certified individuals must be present on each pervious concrete placement, including the test panel placements, and a certified individual must be in charge of the placement crew and procedures.

C. Testing agencies-Agencies that perform testing services on concrete materials shall meet the requirements of ASTM C1077. Agencies inspecting the Work shall meet the requirements of ASTM E329. Testing agencies performing the testing shall be accepted by the Engineer before performing any Work.

D. Field technicians-Field tests of concrete required in 1.05.F shall be performed by an individual certified as both an NRMCA Certified Pervious Concrete Technician, or equivalent, and an ACI Concrete Field Testing Technician- Grade I, or equivalent.

E. Responsibilities of the Contractor
1. Advise testing agency at least 48 hours before concrete placement.
2. Test panels-Place two test panels on the project site, on a subgrade and subbase prepared as specified, using the material and construction requirements for pavement in this Specification. Each panel must have an area of at least 225 square feet, and a width and thickness as specified for the pavement in the Contract Documents.

F. Responsibilities of testing agency
1. Complete at least one density test on a sample of freshly mixed pervious concrete for each day of concrete placement and for each test panel in accordance with ASTM C1688/C1688M. Sample freshly mixed concrete in accordance with ASTM C172/C172M. Size of sample shall be at least 1 cubic foot.
2. Remove three cores from each lot of 5000 square feet and each test panel in accordance with ASTM C42/C42M, not less than 7 days after placement of the pervious concrete.
   a. Cores shall be a nominal 4 in. diameter.
   b. Select three core locations in accordance with ASTM D3665.
   c. Measure the core length in accordance ASTM C174/C174M.
   d. After thickness determination, trim the cores and measure the hardened density of the core in accordance with Paragraphs 8.3 and 9.3 of ASTM C140. Trim core bottoms to remove only the material necessary to produce a flat end. Trimmed core ends shall be perpendicular to the longitudinal axis and meet the requirements of ASTM C42/C42M, 7.4.1 and 7.4.2.
   e. Record the length and density of each individual core and the average length and density of the three cores. Test results will be submitted to the Contractor, concrete producer, and the Engineer within 24 hours of completing the tests.
   f. Core holes shall be filled with conventional concrete, preblended grout or pervious concrete if approved by the Engineer.

G. Acceptance of test panels
1. The fresh density from a test panel shall be within ±5 lb/ft3 of the accepted fresh density from the submitted mixture proportion in 1.02.A.3.
2. Tolerances from specified thickness of pavement shall comply with the following:
   a. Average length of three cores: -3/8 in., +1.5 in.
   b. Length of an individual core: -3/4 in.
3. If the test panel does not comply with 1.05.G.1 and 1.05.G.2, the test panel shall be rejected, removed, and replaced at Contractor's expense, unless otherwise permitted.
4. If the test panel complies with 1.05.G.1 and 1.05.G.2 and the Engineer accepts the test panel, the panel may be left in place and included in the completed Work. The average hardened densities from the two accepted test panels shall be the hardened density used as the basis of acceptance for the remainder of the pavement in accordance with 1.05.H.3.

H. Acceptance of pavement
1. The fresh density from a lot must be within ±5 lb/ft3 of the accepted fresh density from the submitted mixture proportion in 1.02.A.3.
2. Tolerance from specified thickness of pavement shall comply with the following:
   a. Average length of three cores: -3/8 in., +1.5 in.
   b. Length of an individual core: -3/4 in.
3. The average hardened density from a lot must be within ±5 percent of the accepted

hardened density in 1.05.G.4.

4. When a lot is outside one or more of the limits of 1.05.H.1 through 1.05.H.3, the lot shall be subject to rejection, removal, and replacement at Contractor's expense, unless accepted by Owner.

PART 2 - PRODUCTS

2.1 SUBBASE

Coarse aggregates shall meet the size and grading requirements of Contract Documents including:

1. DE No. 57 Coarse Aggregate Layer
2. DE No. 3 Stone Primary Subbase Layer

2.2 PERVIOUS CONCRETE

A. Pervious concrete shall comply with ASTM C94/C94M (except sections: 4.2, 6.1.2, 6.1.3, 6.1.4, 6.1.5, 7, 8, 16, 17, 18, 19, and 20) and the requirements listed in 2.2.1 through 2.2.7. The volume of fresh concrete in a given batch shall be determined from the total mass of the batch divided by the design density of the concrete. The total mass of the batch shall be determined as the net mass of the concrete in the batch as delivered, including the total mixing water as defined in ASTM C94/C94M Paragraph 9.3.

1. Thickness-The thickness of pervious concrete pavement shall be as specified in contract documents.
2. Aggregates-Nominal maximum aggregate size shall not exceed 1 in., unless otherwise specified.
3. Cement-Cement shall comply with ASTM C150/C150M, C595/C595M, or C1157/C1157M.
4. Admixtures-Chemical admixtures shall comply with ASTM C260/C260M, ASTM C494/C494M, or ASTM C1017/C1017M unless otherwise specified. When hydration-stabilizing admixtures are proposed as a part of the base mix design, the Contractor shall clearly indicate the proposed working time on the submittal containing the mix proportions. Where no hydration-stabilizing admixtures are proposed as a part of the base mix design, the maximum working time will be 60 minutes in accordance with 3.4.A.
5. Fibers-Fibers shall comply with ASTM C1116/C1116M, 4.1.3 or 4.1.4. Fibers may be used in pervious concrete mixtures when permitted by the Engineer.
6. Pigments-Pigments shall comply with ASTM C979/C979M.
7. Supplementary cementitious materials-Supplementary Cementitious Materials shall comply with ASTM C618, C989/C989M, or C1240.
8. Mix Water - as appropriate for approved mis design. ASTM C 1602

2.3 ISOLATION JOINT MATERIAL

A. Isolation joint materials shall comply with ASTM D994, D1751, or D1752.

2.4 FORMS

A. Fabricate forms with steel, wood, or other material that is sufficiently rigid to maintain specified tolerances, and capable of supporting concrete and mechanical concrete placing equipment.
B. Forms shall be clean and free of debris of any kind, rust and hardened concrete.

2.5 POLYETHYLENE CURING SHEET

Polyethylene curing sheet shall comply with ASTM C171.

PART 3 - EXECUTION

3.1 SUBGRADE PREPARATION

A. Grade subgrade to over-excavation limits and in accordance with the erosion and sediment control sequence of construction specified in the Contract Plans. The Contractor shall have the responsibility

of sequencing all construction operations such that the subgrade is not fouled or compacted prior to placement of the pervious concrete surface course.

B. Upon reaching subgrade elevation, no debris or other materials that may clog the subgrade may be stockpiled on the subgrade or in a location that would permit sediment-laden runoff from stockpiled areas to discharge onto the subgrade.

C. Keep all traffic off of the subgrade during construction to the maximum extent practical. Scarify subgrade disturbed or compacted by concrete delivery vehicles or other construction traffic as directed by the Engineer.

3.2 SUBBASE

A. The subgrade shall be uniform and free of any and all debris or foreign material prior to placement of the subbase aggregate material.

B. Place the DE No. 3 Stone Primary Subbase Layer over the subgrade in un-compacted, uniform lifts not to exceed 8 inches. Each lift shall be thoroughly densified by a total of at least 3 slow passes with a 10 Ton, smooth drum, vibratory roller. The roller shall have a minimum static weight of 20,000 lbs. Densification of the DE No. 3 Stone Layer shall be conducted with the roller's vibratory function enabled. Placement and vibratory densification shall be completed in the presence of the Engineer or his Qualified Representative.

C. Place the DE No. 57 Stone Layer in un-compacted, uniform lifts not to exceed 6 inches. Each lift shall be thoroughly densified by a total of at least 3 slow passes with a 10 Ton, smooth drum, vibratory roller. The roller shall have a minimum static weight of 20,000 lbs. Densification of the DE No. 3 Stone Layer shall be conducted with the roller's vibratory function enabled. Placement and vibratory densification shall be completed in the presence of the Engineer or his Qualified Representative.

3.3 SETTING FORMWORK

A. Set, align, and brace forms so that the hardened pavement meets the tolerances specified in 3.09 and the jointing requirements specified in 3.12.

B. Apply form release agent to the form face, which will be in contact with concrete, immediately before placing concrete.

C. The vertical face of previously placed concrete may be used as a form.
1. Protect previously placed pavement from damage.
2. Do not apply form release agent to previously placed concrete.

D. Placement width shall be as specified in Contract Documents. When slab panel dimensions and layour are not indicated on the Project Drawings, submit drawings describing proposed jointing in accordance with the General Provisions. See 3.12 below.

E. Concrete placement width shall not exceed 20 ft unless otherwise specified.

F. The larger horizontal dimension of a slab panel shall not exceed 125% of the smaller dimension.

G. The Contractor shall have the responsibility of ensuring that all formwork is set to produce final grades in accordance with the Americans with Disabilities Act (ADA) for all handicap-accessible facilities where pervious concrete is specified.

3.4 BATCHING, MIXING, AND DELIVERY

A. Begin mixing immediately after cement has been added to aggregates. Batch and mix in compliance with ASTM C94/C94M, except that discharge shall be completed within 60 minutes of the introduction of mixture water or aggregate to the cement. Increase time to 90 minutes when using a hydration-stabilizing admixture. Additional water may be added on site, but the fresh density must still meet requirements of 1.05.H.1 after water addition.

3.5 PLACING AND FINISHING FIXED-FORM PAVEMENT

A. Wet the subgrade or subbase with water before concrete placement such that the material is saturated but without any standing water on the prepared subbase immediately before concrete placement.

B. Deposit concrete either directly from the transporting equipment or by conveyor onto the subgrade or subbase, unless otherwise specified.

C. Do not place concrete on frozen subgrade or subbase.

D. Deposit concrete between the forms to an approximately uniform height.

E. Spread the concrete using mechanized equipment or hand tools, without segregation. Troweling shall be not be permitted unless specifically approved by the Engineer.

F. Strike off concrete between forms using a formriding paving machine, roller screed, or vibrating screed. Other strike-off devices may be used when accepted by the Engineer.

G. Finish the pavement to the elevations and thickness specified in accordance with 3.09.

3.6 PLACING AND FINISHING SLIPFORM PAVEMENT

A. The Contractor shall use form riding, plate compactor, or other approved mechanical compactive equipment that will provide a minimum of 10 psi of vertical force. The concrete shall be placed at the required cross slope and shall not deviate more than 3/8 inches in 10 feet. After strike off and compactive efforts have been completed, any surface defects shall be addressed with steel surfaced static rollers. The use of conventional trowels and bull floats is prohibited."

B. Deposit concrete in accordance with 3.05.

3.7 FINAL SURFACE TEXTURE

A. Compact concrete to a dense, open-textured surface to match the appearance of the test panel.
B. Final surface shall be free from surface-sealing from excess paste, debris or over-compaction.

3.8 EDGING

A. Edge top surface to a radius of not less than 1/4in. (6 mm).

3.9 TOLERANCES

A. Construct pavement to comply with the following tolerances:
   1. Elevation: +3/4 in., -3/4 in.
   2. Thickness: +1-1/2 in., -3/8 in.
   3. Contraction joint depth: 1/4 thickness of pavement +1/4 in., -1/4 in.
   4. Smoothness: Similar to approved test panel with no abrupt offsets unless required by the contract drawings.

B. Mechanically sweep or vacuum pavement with clean equipment, or flush with water, before testing for compliance with tolerances.

3.10 CURING

A. Curing procedures shall be complete within 20 minutes of concrete discharge in accordance with the following:

   1. The pavement surface must be covered with a layer of six (6) mil thick polyethylene sheeting.

      i. PRIOR TO THE ARRIVAL OF THE CONCRETE, remove the plastic

sheeting from the box, unfold, measure, and cut to size. Roll the plastic onto a PVC pipe that is of sufficient length to span the forms.

ii. Plastic can now be rolled onto the finished pavement is an efficient manner.

2. On hot weather days, the pavement surface shall be covered with a minimum .20 mil thick polyethylene sheet (painters plastic) or other approved covering material prior to final cross rolling of the surface and then covered with a layer of four to six (4 - 6) mil thick polyethylene sheeting. Prior to covering, an evaporative reducer shall be sprayed above the surface when required due to ambient conditions (high temperature, high wind, and low humidity).

B. The cover shall overlap by 18 inches all exposed edges and shall be secured (without using dirt or stone) to prevent dislocation due to winds or adjacent traffic conditions.

1. Secure plastic to forms with staples or nails.
2. Overlap plastic sheeting as roof tiles to prevent rainwater from infiltrating the pervious concrete until it has sufficiently cured.

C. Prevent wind from billowing up the middle of the plastic by placing wood 2"x4" or rebar across the plastic spanning the form.

3.11 COLD WEATHER CONSTRUCTION

A. Protect concrete from freezing and record concrete temperature no less than twice per 24-hour period in accordance with ACI 306.1.

3.12 JOINTING

A. Control (contraction) joints shall be installed as indicated by plans. They shall be installed at a depth of the 1/3 to 1/4 the thickness of the pavement.

B. These joints are to be saw cut.

C. For saw cuts, the procedure should begin as soon as the pavement has hardened sufficiently to prevent raveling and uncontrolled cracking (normally after curing), minimum of 36 hours after placement.

D. Possible complications from saw cutting include:
1. Removal of plastic to perform saw cutting will cause pervious concrete to hydrate too quickly. If plastic is removed to accommodate saw cutting, re-hydrating of pervious concrete by spraying concrete with water and keep concrete wet until plastic can be reapplied. THIS IS REQUIRED.
2. Sawing pervious concrete too early can damage concrete surface.

E. Transverse constructions joints shall be installed whenever placing is suspended a sufficient length of time that concrete may begin to harden (over 20 minutes).

F. Isolation (expansion) joints should be used in structure widths exceeding thirty (30) feet or at seventy five (75) feet on sidewalks or when pavement is abutting slabs or other adjoining structures.

G. Expansion joint material shall be K-form screed rail or approved equal.

H. To reduce raveling, if transverse or isolation joints are used, or where pervious concrete meets impervious pavement, extra compaction may be necessary.

I. Additional installation specifications for the pervious concrete provided by the material source and engineer shall be followed strictly.

3.13 OPENING TO TRAFFIC

A. Do not open the pavement to passenger cars or light truck traffic until the concrete has cured for at least 7 uninterrupted days, no truck traffic for 10 days, or 48 hours for pedestrian traffic.

PART 4 - METHOD OF MEASUREMENT

4.01 DE NO. 3 STONE

A. The DE No. 3 Stone will be measured per ton, complete in place and accepted.

4.02 DE NO. 57 STONE

A. The DE No. 57 Stone will be measured per ton, complete in place and accepted.

4.03 PERVIOUS PORTLAND CEMENT CONCRETE

A. Pervious Portland Cement Concrete Pavement will be measured in cubic yards, complete in place and accepted.

PART 5 - BASIS OF PAYMENT

5.01 DE NO. 3 STONE

A. The DE No. 3 Stone will be paid for at the contract unit price bid per ton, complete in place, accepted, which price will be full compensation for furnishing, hauling, placing, and all material, labor, equipment, tools, and incidentals necessary to complete the item specified.

5.02 DE NO. 57 STONE

A. The DE No. 57 Stone will be paid for at the contract unit price bid per ton, complete in place, accepted, which price will be full compensation for furnishing, hauling, placing, and all material, labor, equipment, tools, and incidentals necessary to complete the item specified.

5.03 PERVIOUS PORTLAND CEMENT CONCRETE PAVEMENT

A. Pervious Portland Concrete Pavement will be paid for at the contract unit price bid per cubic yard, complete in place, accepted, which price will be full compensation for furnishing, placing, and all material, labor, equipment, tools, and incidentals necessary to complete the item specified.

CONTRACTOR QUALIFICATIONS

A. The Contractor shall employ no less than one National Ready Mixed Concrete Association (NRMCA) Certified Pervious Concrete Craftsman who must be on site, overseeing each placement crew during all concrete placement, or the Contractor shall employ no less than three (3) NRMCA Certified Pervious Concrete Installers, who shall be on site working as members of each placement crew during all concrete placement unless otherwise specified. Alternative documentation of qualifications shall be permitted when approved by the Architect/Engineer. Prior to award of the contract, the placing contractor shall furnish Owner/Engineer a statement attesting to qualifications and experience and the following:

1. A minimum of 3 completed projects, total square footage to exceed 10,000 SF with addresses.
2. Unit weight acceptance data.
3. In-Situ pavement test results including void content and unit weight.
4. Sample of Product (i.e. core or test panel)

B. If the placing contractor and concrete producer have insufficient experience with Portland Cement pervious concrete pavement (less than 3 successful jobs), the placing contractor shall either:

1. Retain an experienced consultant or NRMCA Certified Pervious Craftsman to

monitor production, handling, and placement operations at the contractor's expense, or

2. Receive permission in writing from the Engineer or Owner of the acceptance of the contractor's experience on past projects as sufficient.
3. The Owner and/or Contractor may contact the PCA/Northeast for information on qualified/NRMCA certified contractors and personnel. Contact Director Kenneth Justice, P.E. at (215) 540-9999.

PRE PAVING CONFERENCE

A pre-paving conference with the engineer shall be held two (2) days prior to beginning placing the pervious concrete. The contractor shall have the pervious concrete consultant, ready mix supplier, the foreman and the entire concrete crew that will form and place the concrete in attendance at this meeting.

PERVIOUS PAVEMENT CONCRETE TESTING, INSPECTION, AND ACCEPTANCE

A. The CONTRACTOR will retain an independent testing laboratory.
B. The testing laboratory shall conform to the applicable requirements of ASTM E 329 "Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction" and ASTM C 1077 "Standard Practice for Testing Concrete and Concrete Aggregates for use in Construction, and Criteria for Laboratory Evaluation" and shall be inspected and accredited by the Construction Materials Engineering Council, Inc. or by an equivalent recognized national authority.
C. The Agent of the testing laboratory performing field sampling and testing of concrete shall be certified by the American Concrete Institute as a Concrete Field Testing Technician Grade I, or by a recognized state or national authority for an equivalent level of competence.
D. Testing and Acceptance:

1. A minimum of 1 gradation test of the subgrade is required every 5,000 square feet to determine percent passing the No. 200 sieve per ASTM C 117.
2. A minimum of one test for each load of pervious concrete in accordance with ASTM C 1688 to verify unit weight shall be conducted. Delivered unit weights are to be determined in accordance with ASTM C 1688 using a 0.25 cubic foot cylindrical metal measure. The measure is to be filled and compacted in accordance with ASTM C 1688. The unit weight of the delivered concrete shall be +/- 5 pcf of the design unit weight.
3. Test panels shall have two cores taken from each panel in accordance to ASTM C 42 at a minimum of seven (7) days after placement of the pervious concrete. The cores shall be measured for thickness, void content and unit weight in accordance with ASTM C1754. Range of satisfactory unit weight values are +/- 5 pcf of the design unit weight.
4. After a minimum of seven (7) days following each placement, three cores shall be taken in accordance with ASTM C 42. The cores shall be measured for thickness, void content and unit weight determined as described above for test panels. Core holes shall be filled with concrete meeting the pervious design or other concrete material as permitted by the owner.

E. Maintenance: There shall be a maintenance plan submitted by the owner to prevent the clogging of the pervious concrete pavement which shall include periodic testing for flowability by the pervious concrete installer prior to the pervious concrete being opened to service, in accordance with ASTM C 1701 - Standard Test Method for Infiltration Rate of In Place Pervious Concrete, with flow rates reported in writing to the owner and again at six (6), twelve (12) eighteen (18) and twenty-four (24) months and again report the results in writing to the owner. The owner must have a plan and methods to restore flowability if the flow rate drops below 75% of the original rate.

6/23/15

B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain components including roof insulation for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.

B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. Roofing System Design: Tested by a qualified testing agency to resist the following uplift pressures:

1. Corner Uplift Pressure: ~~27~~ 67 lbf/sq. ft.
2. Perimeter Uplift Pressure: 45 lbf/sq. ft.
3. Field-of-Roof Uplift Pressure: ~~67~~ 27 lbf/sq. ft.

D. FM Global Listing: Roofing, base flashings, and component materials shall comply with requirements in FM Global 4450 or FM Global 4470 as part of a roofing system, and shall be listed in FM Global's "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.

1. Fire/Windstorm Classification: Class 1A-120.

preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.

a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
b. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
c. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.4 ENTRANCE DOOR SYSTEMS

A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation. Basis of Design door shall be AA425 Series Thermal Entrance Door by Kawneer North America, or approved equal by the approved storefront system manufacturer.

1. Door Construction: ~~1-3/4-inch overall thickness, with~~ minimum 0.125-inch-thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.

a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.

2. Door Design: Wide stile; 5-inch (or 4-1/2 inch) nominal width.
3. Glazing Stops and Gaskets: Square, snap-on, extruded-aluminum stops and preformed gaskets.

a. Provide nonremovable glazing stops on outside of door.

2.5 ENTRANCE DOOR HARDWARE

A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 087100 "Door Hardware."

B. General: Provide entrance door hardware for each entrance door to comply with requirements in this Section.

1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products complying with BHMA standard referenced.
2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
3. Opening-Force Requirements:

a. Egress Doors: Not more than 15 lbf to release the latch and not more than 30 lbfto set the door in motion and not more than 15 lbf to open the door to its minimum required width.
b. Accessible Interior Doors: Not more than 5 lbf to fully open door.

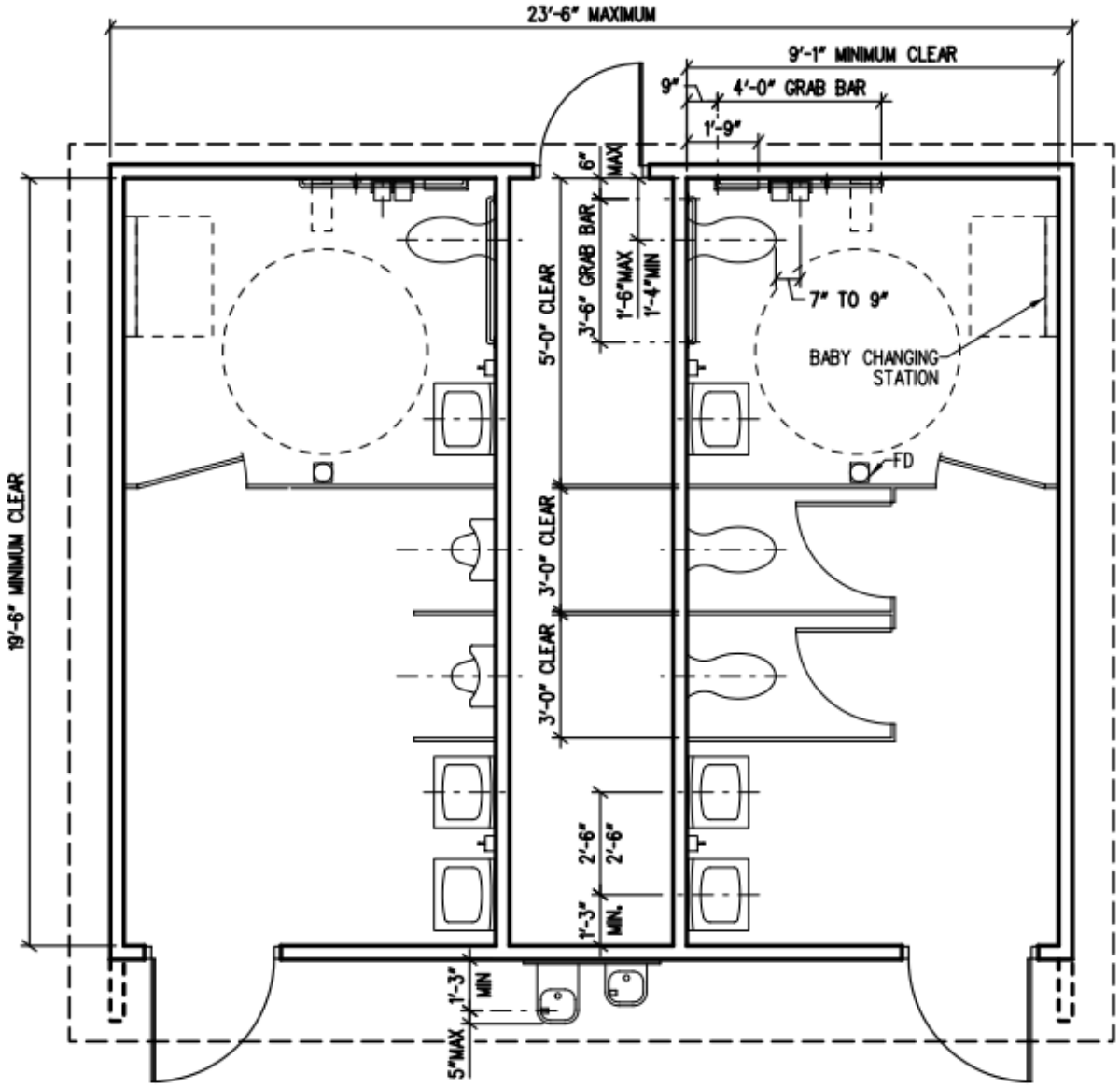
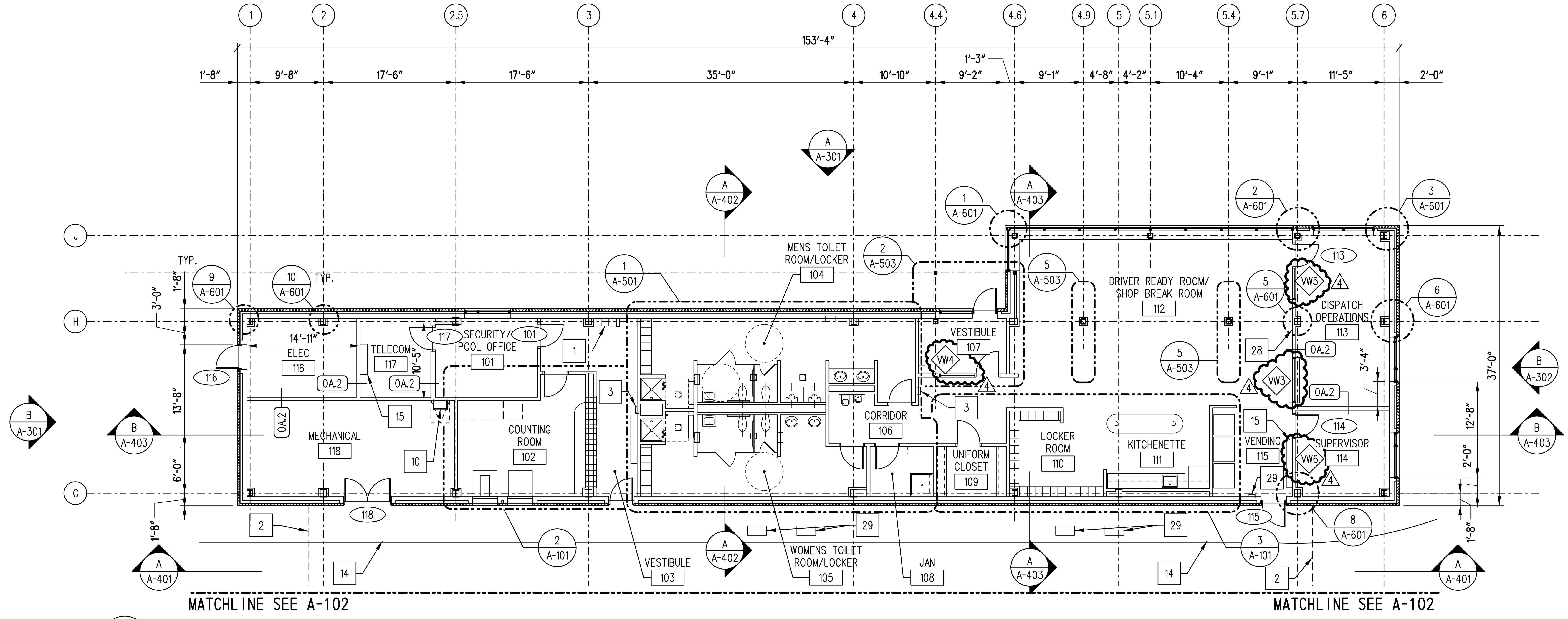
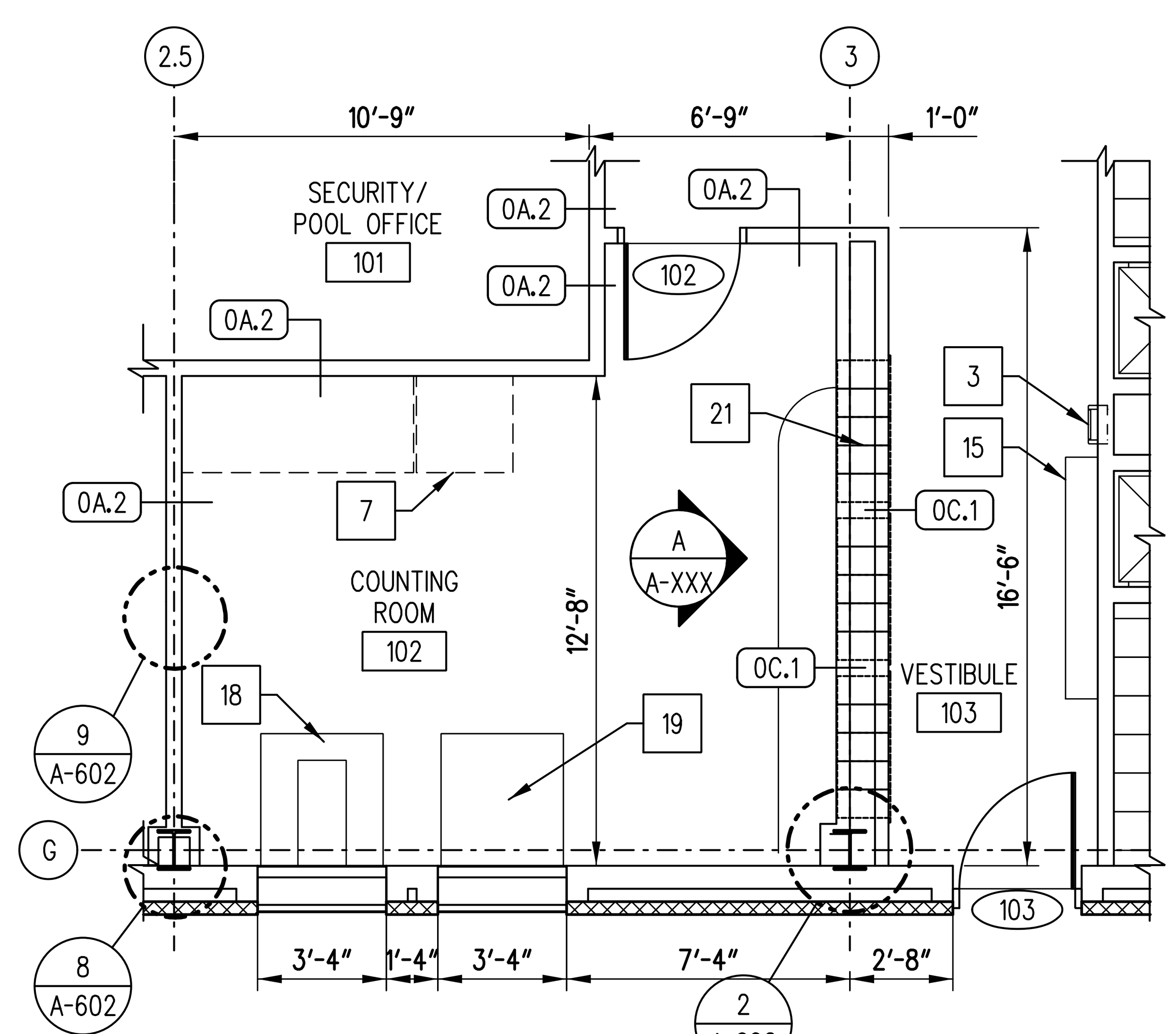

23'-6" MAXIMUM
9'-1" MINIMUM CLEAR
9"
4'-0" GRAB BAR
1'-9"
6" MAX
3'-6" GRAB BAR
1'-6"MAX
1'-4"MIN
5'-0" CLEAR
7" TO 9"
BABY CHANGING STATION
FD
19'-6" MINIMUM CLEAR
3'-0" CLEAR
3'-0" CLEAR
2'-6"
2'-6"
1'-3" MIN.
1'-3" MIN
5"MAX

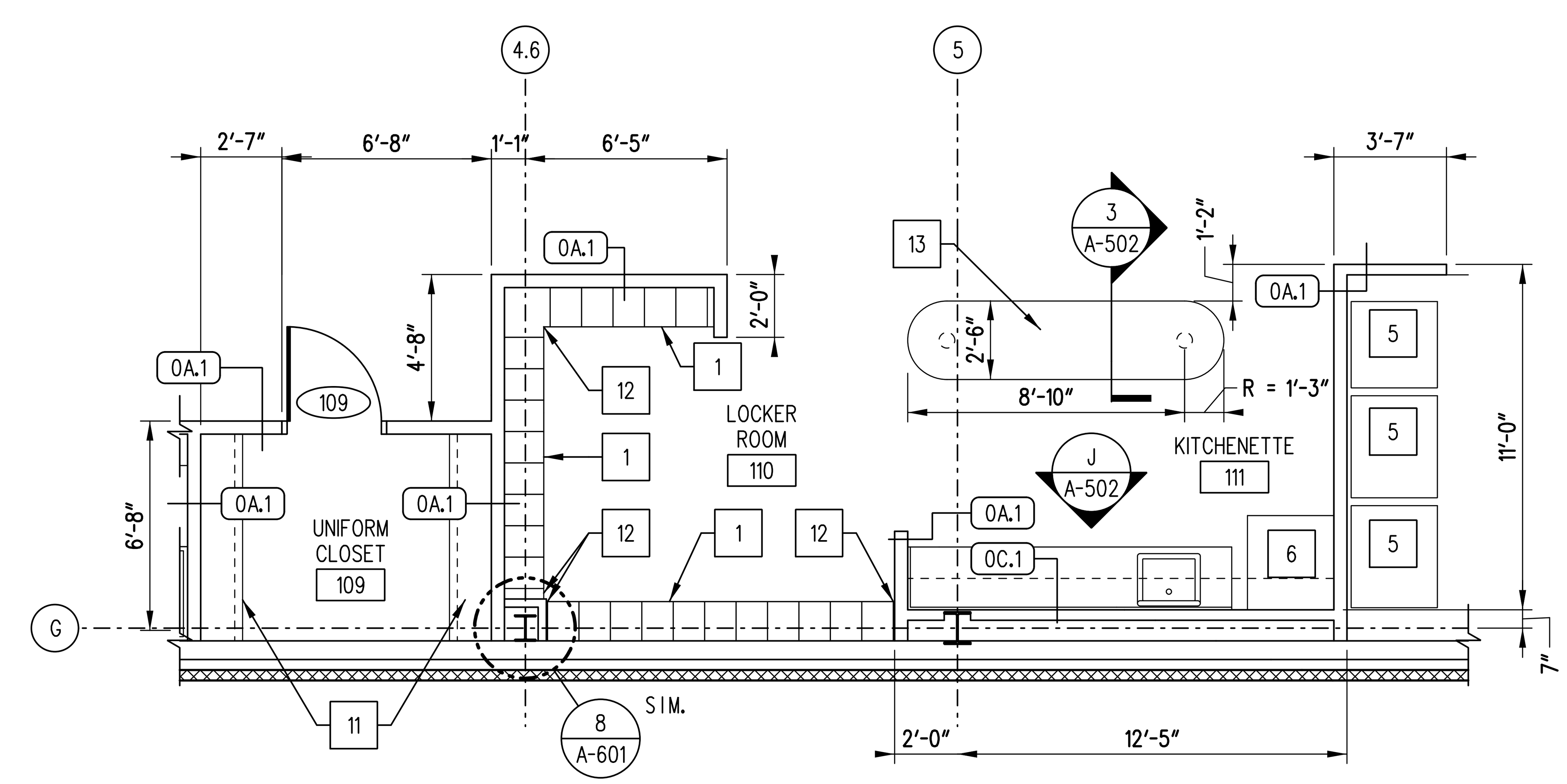
Figure 1



1 FLOOR PLAN - NORTH BUILDING (A-101)
SCALE: 1/8"=1'-0"



2 ENLARGED PLAN (A-101)
SCALE: 1/4"=1'-0"



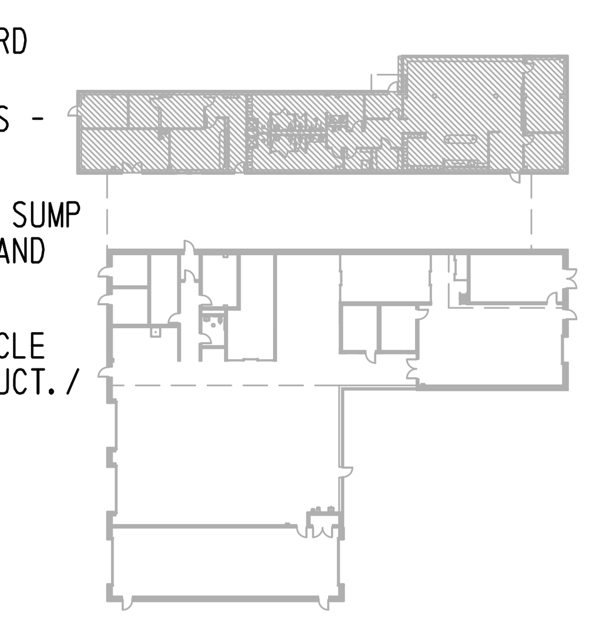
3 ENLARGED PLAN (A-101)
SCALE: 1/4"=1'-0"

DRAWING NOTES

1. SPECIFIC CONSTRUCTION NOTES LISTED ON PLAN SHEETS DO NOT NECESSARILY APPLY TO EVERY PLAN SHEET.
2. NOT ALL DIMENSIONS, WALL TAGS, OR DOOR NUMBERS ARE PROVIDED ON FLOOR PLANS. SEE ENLARGED PLANS OF AREAS INDICATED ON PLAN FOR SUCH ITEMS.

CONSTRUCTION NOTES

1	12" WIDE BY 15" DEEP DOUBLE TIER LOCKERS
2	LINE OF ROOF ABOVE.
3	FIRE EXTINGUISHER AND CABINET: SURFACE MTD. (FEC-S) ON CMU WALLS; SEMI-RECESSED (FEC-SR) IN STUD WALLS LESS THAN 6"; RECESSED (FEC-R) IN STUDS 6" OR GREATER
4	15" WIDE BY 18" DEEP DOUBLE TIER LOCKERS
5	VENDING MACHINE (NIC)
6	REFRIGERATOR
7	SAFE (NIC)
8	ALUMINUM SHIPS LADDER TO MEZZANINE - SEE SHEET A-504 FOR MEZZANINE
9	EDGE OF MEZZANINE FLOOR ABOVE - SEE A-504 AND STRUCTURAL
10	ROOF ACCESS LADDER AND HATCH ABOVE
11	CLOTHES ROD WITH SHELF ABOVE
12	METAL FILLER PANEL TO MATCH METAL LOCKER FINISH.
13	1-1/2" PLASTIC LAMINATE COUNTERTOP, PLAM-4.
14	EDGE OF EXTERIOR SIDEWALK - SEE CIVIL
15	CABINET UNIT HEATER / ACU - SEE MECHANICAL
16	CORRUGATED METAL PANEL SIDING
17	WIRE MESH GFI STORAGE CAGE
18	FARE PULL VAULT - OWNER FURNISHED AND CONTRACTOR INSTALLED
19	THROUGH-WALL PARCEL DROP BOX
20	12" WIDE BY 15" DEEP SINGLE TIER METAL LOCKERS
21	REAR LOADING POST OFFICE BOXES
22	WIRE MESH PARTITIONS TO UNDERSIDE OF ROOF DECK AND 4070 SLIDING DOOR
23	WALL MOUNTED COAT HOOKS - TOTAL (6)
24	TIME CLOCK - OWNER FURNISHED AND CONTRACTOR INSTALLED
25	ELECTRIC WATER COOLER - SEE PLUMBING
26	UTILITY SINK - SEE PLUMBING
27	CONCRETE FILLED STEEL PIPE BOLLARDS - SEE CIVIL DRAWINGS
28	3'x4' TACK BOARD
29	FUEL DISPENSERS - SEE PLUMBING
30	TRENCH DRAIN / SUMP - SEE STRUCT. AND PLUMBING
31	IN-GROUND VEHICLE LIFT - SEE STRUCT./ EQUIP. PLANS



KEY PLAN
SCALE: N.T.S.

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DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS	
4 ADDED VIEW WINDOW TAGS	

SCALE: 1/4" = 1'-0" (0 2' 4' 8')
SCALE: 1/8" = 1'-0" (0 4' 8' 16')

DELAWARE TRANSIT CORPORATION
LEWES PARK AND RIDE
AND MAINTENANCE FACILITY

CONTRACT	T200612502
COUNTY	SUSSEX
BRIDGE NO.	
DESIGNED BY:	KDM/NCL
CHECKED BY:	EJ

FLOOR PLAN
NORTH BUILDING

A-101
SHEET NO. 84
TOTAL SHTS. 185

LIGHTING FIXTURE SCHEDULE

FIX. TYPE	DESCRIPTION	MOUNTING	LAMPS NO.	LAMPS WATTS	LAMPS TYPE	VOLTS	MAUNFACTURER AND CATALOG NUMBER	REMARKS	
A	2' X 4' ENERGYMAX INTERSECT FULL DISTRIBUTION RECESSED ARCHITECTURAL LUMINAIRE WITH 2 X 6 CELL MATTE WHITE LOUVER	RECESSED	2	32	T8	277	COLUMBIA LIGHTING EMI24-232G-E104U		
B	4' LINEAR FLUORESCENT, FROSTED ARCYLIC LENS, CORROSION RESISTANCE STEEL HOUSING, DIMMABLE	SURFACE	2	32	T8	277	BARTCO IPR8MS2UISFSMWH		
C	4' PREMIUM TURRET INDUSTRIAL FLUORESCENT FIXTURE	SUSPENDED	2	32	T8	277	COLUMBIA LIGHTING IC4-232-ST-EUICFC		
D	4' PREMIUM INDUSTRIAL FLUORESCENT FIXTURE	SUSPENDED	2	32	T8	277	COLUMBIA LIGHTING KL4-232-ST-E-U		
E	6" COMPACT FLUORESCENT DOWN LIGHT, PRISMATIC GLASS LENSE, WHITE PAINTED RELECTOR	RECESSED	1	26	26TRT	277	GOTHAM LGF1/26TRT6RWT73MVOLT		
F	HIGH BAY LED, SPECULAR REFLECTOR AND CLEAR CURVED ACRYLIC LENS	PENDANT	-	146	LED	277	DIALIGHT HB1C4N-LM79	MOUNT AT 25' AFF	
G	2' X 4' SPECIFICATION GRADE STATIC TROFFER WITH ACRYLIC PRISMATIC PATTERN 12 LENS	RECESSED	2	32	T8	277	COLUMBIA LIGHTING 4PS24-232G-FSA12-EU		
H	4'LONG X 4"X5" SLIM WALL MOUNT LIGHT WITH OPAL ACRYLIC LENS	WALL	2	32	T8	277	COLUMBIA LIGHTING W4-232-EU		
J	4' FLOURESCENT, ENCLOSED AND GASKETED FIBERGLASS INDUSTRIAL FIXTURE WITH CLEAR ACRYLIC CREPE LENS, UL LISTED FOR WET LOCATIONS.	WALL	3	32	T8	277	COLUMBIA LIGHTING FNPH4-332-EU2H3S	MOUNT AT 12' AFF	
K	DESIGNER EMERGENCY LIGHT	SURFACE	2	12	LED	277	Dual Light CV2NI		
K2	HIGH CAPACITY EMERGENCY LIGHTING UNIT, UL LISTED FOR DAMP LOCATIONS	SURFACE	2	56	LED	277	Dual Light LM56NDI		
L	(2) HEAD LED AREA LUMINAIRE, WIDE THROW DISTRIBUTION, ENERGY EFFICIENT, BLACK FINISH.	POLE	100C	436	LED	277	LITHONIA DSX2 LED 100C 700 40K T5W MVOLT SPA DBLXD	PROVIDE WITH INTERNAL PHOTOCELL	1
M	LED AREA LUMINAIRE, FORWARD THROW MEDIUM DISTRIBUTION, ENERGY EFFICIENT, BLACK FINISH.	POLE	100C	218	LED	277	LITHONIA DSX2 LED 100C 700 40K T4M MVOLT SPA DBLXD	PROVIDE WITH INTERNAL PHOTOCELL	2
N	LED AREA LUMINAIRE, FORWARD THROW MEDIUM DISTRIBUTION, ENERGY EFFICIENT, BLACK FINISH.	POLE	80C	37	LED	277	LITHONIA DSX2 LED 80C 530 40K T4M MVOLT SPA DBLXD	PROVIDE WITH INTERNAL PHOTOCELL	2
P	LED AREA LUMINAIRE, MEDIUM THROW DISTRIBUTION, HOUSE-SIDE SHIELD, ENERGY EFFICIENT, BLACK FINISH.	POLE	100C	218	LED	277	LITHONIA DSX2 LED 100C 700 40K T3M MVOLT SPA HS DBLXD	PROVIDE WITH INTERNAL PHOTOCELL	2
R	LED AREA LUMINAIRE, SHORT THROW DISTRIBUTION, HOUSE-SIDE SHIELD, ENERGY EFFICIENT, BLACK FINISH.	POLE	80C	142	LED	277	LITHONIA DSX2 LED 80C 530 40K T1S MVOLT SPA HS DBLXD	PROVIDE WITH INTERNAL PHOTOCELL	2
S	LED AREA LUMINAIRE, MEDIUM THROW DISTRIBUTION, ENERGY EFFICIENT, BLACK FINISH.	WALL	30C	54	LED	277	LITHONIA DSXW2 LED 30C 530 40K T4M MVOLT DBLXD	PROVIDE WITH INTERNAL PHOTOCELL	
T	LED AREA LUMINAIRE, REGULAR THROW DISTRIBUTION, ENERGY EFFICIENT, WHITE FINISH.	SURFACE	30C	67	LED	277	LITHONIA DSXSC LED 30C 700 40K T5R MVOLT DWHXD	CONNECT TO FIELD LOCATED EXTERNAL PHOTOCELL	
U	LED FLOOD LIGHT LUMINAIRE, HORIZONTAL FLOOD DISTRIBUTION, SINGLE "COB" ENGINE, ENERGY EFFICIENT, BLACK FINISH.	POLE	COB	21	LED	277	LITHONIA DSXF1-LED-1-A530/40K-HMF-MVOLT-THK-PE-DBLXD	PROVIDE WITH INTERNAL PHOTOCELL	3
W	LED WALL LUMINAIERE, MEDIUM DISTRIBUTION, SINGLE ENGINE, ENERGY EFFICIENT, BLACK FINISH.	WALL	10C	39	LED	277	LITHONIA LIGHTING TWH LED 10C T3M MVOLT PE DBLXD	PROVIDE WITH INTERNAL PHOTOCELL	
W2	LED WALL LUMINAIERE, MEDIUM DISTRIBUTION, DOUBLE ENGINE, ENERGY EFFICIENT, BLACK FINISH.	WALL	20C	72	LED	277	LITHONIA LIGHTING TWH LED 20C T3M MVOLT PE DBLXD	PROVIDE WITH INTERNAL PHOTOCELL	
W3	LED WALL LUMINAIERE, MEDIUM DISTRIBUTION, TRIPLE ENGINE, ENERGY EFFICIENT, BLACK FINISH.	WALL	30C	104	LED	277	LITHONIA LIGHTING TWH LED 30C T3M MVOLT PE DBLXD	PROVIDE WITH INTERNAL PHOTOCELL	
X	CAST ALUMINUM LED EXIT SIGN WITH RED LETTERING	SURFACE	1	3.8	LED	277	DUAL LITE SESRWEI		
X1	CAST ALUMINUM LED EXIT SIGN WITH RED LETTERING, UL LISTED FOR DAMP LOCATIONS	SURFACE	1	7.22	LED	277	DUAL LITE LED2EMRWW		
X2	CAST ALUMINUM LED EXIT SIGN WITH RED LETTERING, UL LISTED FOR WET LOCATIONS	SURFACE	1	3.8	LED	277	DUAL LITE LN4XRWE		

SPECIFIC NOTES:

1. MOUNT FIXTURE TO 40FT, DUAL LUMINAIRE, SITE POLE RATED FOR 140MPH. LITHONIA CAT# (6)RTS 40 9-0B DM28 FBC VD-SNAKE DDB/GALV L/AB.
2. MOUNT FIXTURE TO 40FT, SINGLE LUMINAIRE, SITE POLE RATED FOR 140MPH. LITHONIA CAT# (5)RTS 40 9-0B DM19 FBC VD-SNAKE DDB/GALV L/AB.
3. STEM MOUNTED TO RGS PIPE 12 INCHES ABOVE FINISHED GRADE.

BASIS OF DESIGN NOTE:

PRODUCTS LISTED ARE THE BASIS OF DESIGN, CONTRACTOR MAY SUBMIT EQUALS FOR REVIEW AND APPROVAL.

4 CONTRACTOR MUST VERIFY, ANY EQUAL FIXTURE SUBMITTED WILL MEET THE MINIMUM REQUIRED FOOT-CANDLE LEVEL LISTED IN THE IES STANDARDS FOR EACH ROOM OR AREA. AT THE REQUEST OF THE ENGINEER THE CONTRACTOR SHALL PROVIDE FOOT-CANDLE CALCULATIONS TO SUPPORT COMPLIANCE. THIS APPLIES TO BOTH INTERIOR AND EXTERIOR APPLICATIONS.

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DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

4 ADDED BASIS OF DESIGN / "OR EQUAL" NOTE	

DELAWARE TRANSIT CORPORATION
LEWES PARK AND RIDE
AND MAINTENANCE FACILITY

CONTRACT	T200612502
COUNTY	SUSSEX
BRIDGE NO.	
DESIGNED BY:	MSM
CHECKED BY:	AP

ELECTRICAL
PANEL SCHEDULES

	E-701
SHEET NO.	181
TOTAL SHTS.	185