LS 2780

AIA – PRECAST CONCRETE PAVERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Furnishing, transporting, and placing precast concrete pavers on an aggregate or bituminous base as shown on the Drawings.

B. Preparing subgrade to receive base course materials.

C. Placing and compacting base course materials.

D. Adjust to grade all existing catch basins, etc.

1.2 REFERENCES

A. AASHTO M 43 Standard Specifications for Size of Aggregate for Road and Bridge Construction.

B. ASTM C-33 Standard Specifications for Concrete Aggregate.

C. ASTM C-136 Standard Test Method of Sieve Analysis of Fine and Coarse Aggregates.

D. ASTM C-150 Standard Specification for Portland Cement.

E. ASTM C-418 Standard Test Method for Abrasion Resistance of Concrete by Sandblasting.

F. ASTM C-936 Standard Specifications for Solid Concrete Interlocking Paving Unit.

G. ASTM C-1549 Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.

H. State of Ohio - Department of Transportation – Construction and Material Specifications as amended to date, Item 411, Stabilized Crushed Aggregate.

1.3 SUBMITTALS

A. Product Data

1. Precast concrete pavers

B. Samples

1. For Laboratory Analysis

a. Aggregate base material (one sample for each material source for each type). (200 lb. minimum).

b. Bedding and joint sand (one sample for each material source for each type) (10 lb. minimum).

2. Precast Concrete Pavers

a. Four units of each size, each type, and each thickness.

C. Quality Control Submittals

1. Test Reports

a. Freeze/thaw tests in conformance with ASTM C-67. This test shall be conducted no more than 12 months prior delivery of units.

b. Abrasion test in conformance w9ith ASTM C-418.

2. Certificates

a. Furnish certification that all precast concrete pavers provided are in conformance with ASTM C-936.

3. Manufactures Instructions

a. Furnish installation instructions for precast concrete pavers.

1.4 QUALITY ASSURANCE

A. Qualifications

1. Manufacturer Qualifications

a. Manufacturer of precast concrete pavers must have a least five (5) years of successful experience in the fabrication and production of precast units.

b. Manufacturer of precast concrete pavers must produce its precast units using production methods which result in color blend production control, minimum breakage, and optimal custom color blending. Any manufacturing process which creates an uneven or "patchwork" effect within a range of colors, or which will require hand sorting to uniformly disperse the color throughout the field of color will be rejected.

2. Installer qualifications

a. Installer must have been consistently engaged in the installation of precast concrete pavers meeting the criteria as set forth herein for at least the last five (5) years.

b. Installer must be able to provide reference for at least five (5) completed jobs of similar scale and nature.

1.5 DELIVERY, STORAGE, and HANDLING

A. Packing and Shipping

1. Deliver pavers in manufacturer's original palletized condition with seals and rust resistant banding intact.

2. Sand shall be delivered at least one day before it is used in order to allow free moisture to drain from the material.

B. Acceptance at Site

1. All material and all equipment shall be subject to visual inspection and acceptance or rejection after delivery to the site of the Work. All rejected material shall immediately be removed from the site.

C. Storage and Protection

1. All pavers shall be stored on timber supports or pallets above the ground and out of flood areas. Material shall be protected from mud, dirt, oil, grease, ice and frost.

2. Bedding and joint sand shall be stored on an impervious membrane or on the compacted aggregate base material. The sand shall be protected from rain or additional moisture.

1.6 PROJECT CONDITIONS

A. Field Measurements

1. Precast concrete pavers vary slightly in size depending on the manufacturer supplying the pavers. Therefore, it shall be the responsibility of the Contractor to coordinate the exact dimension of the pavers to be installed (including allowable tolerances) with dimensions for paver areas indicated on Drawings prior to the installation of any poured concrete walks. Contractor shall make modifications to paver area dimensions to eliminate as much cutting of pavers as possible.

1.7 WARRANTY

A. Any settlement of pavers within the one year guarantee period shall be adjusted by the Contractor at Contractor's expense.

1.8 MAINTENANCE

A. Maintenance Services

1. Any vegetation that grows in the joints within the one year guarantee period shall be killed by the Contractor at the Contractor's expense and a non-selective contract herbicide according to the manufacturer's instructions and approved by the Owner.

PART 2 – PRODUCTS

2.1 AGGREGATE MATERIALS

A. Aggregate Base for Permeable Pavers

1. Aggregate base shall be washed crushed limestone or washed crushed gravel.

2. Aggregate base shall conform to AASHTO M43 gradation for Size 57 as listed below:

Sieve Size	% Passing
1½"	100
1"	95 – 100
½"	25 – 60
No. 4	0 – 10
No. 8	0 – 5

3. Physical Properties

a. Shale shall not exceed five percent (5%).

b. Loss, sodium sulfate soundness test, shall not exceed five percent (5%).

B. Aggregate Sub Base for Permeable Pavers

1. Aggregate base shall be crushed limestone or crushed gravel.

2. Aggregate base shall conform to AASHTO M43 gradation for Size 2 as listed below:

Sieve Size	% Passing
3"	100
2½"	90 – 100
2"	35 - 70
1½"	0 - 15
¾"	0 – 5

3. Physical Properties

a. Shale shall not exceed five percent (5%).

b. Loss, sodium sulfate soundness test, shall not exceed five percent (5%).

C. Bedding, Joint, and Void Opening Aggregate for Permeable Pavers

1. Bedding and joint aggregate shall be washed, well graded, angular and free from deleterious or foreign matter.

2. The particles shall be sharp and conform to the grading requirements of AASHTO M43, No. 8 size, as shown below:

Sieve Size	% Passing
½"	100
⅜"	85 – 100
No. 4	10 - 30
No. 8	0 – 10
No. 16	0 – 5

2.3 PRECAST CONCRETE PAVERS

A. Portland Cement

1. Portland cement used in the manufacturing of precast concrete pavers shall conform to ASTM C-150, Type I.

B. Physical Requirements

1. Concrete pavers shall conform to ASTM C-936.

2. At the time of delivery to the work site, the average compressive strength of test samples shall be 8000 psi, with no individual unit less than 7200 psi.

3. The average absorption of test samples shall not be greater than five percent (5%) with no individual unit greater than seven percent (7%).

4. When tested in accordance with ASTM C-67, units shall have no breakage and maximum 1.0% loss in dry weight of any individual unit when subjected to 50 cycles of freezing and thawing.

5. When tested in accordance with ASTM C-418, units shall not have a great volume loss than 0.915 $in.^3$ per 7.75 $in.^2$. The average thickness loss shall not exceed 0.118 inches.

6. Where required, top edges of pavers shall be chamfered 4mm vertically and 6mm horizontally. Chamfers shall be clean and fee of spurs. Indented patterns on units shall be clean and distinctive in appearance to match joints between units. Pavers showing leakage of material at the form of template's edge during manufacturing will be rejected.

7. Surface texture shall be well consolidated to avoid honeycombing of material and provide a consistent texture throughout the work.

C. All pavers shall be provided in spacers ribs.

D. Pavers.

1. Permeable pavers shall be 10.24" x 10.24" x 3/15" thick, style Eco-Optiloc or approved equal.

E. Paver color to be determined by Owner.

F. Permeable pavers shall have a Solar Reflective Index (SRI) of 29 or greater. Testing by the manufacturer to determine the SRI shall be in accordance with ASTM C-1549.

G. Pavers shall be precast concrete units as manufactured by Unilock, Inc., Rittman, Ohio (www.unilock.com) or approved equal.

PART 3 – EXECUTION

3.1 PREPARATION OF SUBGRADE

A. Ensure rough grading has brought subgrade to required elevations.

B. Fill soft spots and hollows with additional fill.

C. Level and compact subgrade to receive aggregate base material.

3.2 PLACEMENT OF BEDDING FOR PERMEABLE PAVERS

A. Spread the bedding aggregate evenly over the base course and screed to nominal 1½" inch thickness. The bedding aggregate should not be disturbed. Place sufficient bedding aggregate to stay ahead of the laid pavers. Do not use the bedding aggregate to fill depressions in the base surface.

3.3 PLACEMENT OF PERMEABLE PAVERS

A. Pavers shall be free of foreign material before installation.

B. Pavers shall be inspected for color distribution and all chipped, damaged or discolored pavers shall be replaces.

C. The pavers shall be laid in pattern(s) as shown on the Drawings.

D. Joints between the pavers shall be maintained according to the spacer bars.

E. Gaps at the edges of the paved area shall be filled in cut pavers.

   1. Units cut no smaller than one-third of a whole paver are recommended along edges subject to vehicular traffic.

F. Pavers to be placed along the edge shall be cut with a masonry saw.

   1. The use of infill concrete or discontinuities in patterns will not be permitted.

G. Upon completion of cutting, the area must be swept clean of all debris to facilitate inspection and to ensure pavers are not damaged during compaction.

H. Compact the pavers using the low amplitude, high frequency plate compactor with a minimum compaction force of 5000 lbs.

I. The pavers should be protected during the vibration process by laying a square of carpeting or plywood over the pavers, or by using a rubber roller attachment on the vibrator or wrapping the vibrator with carpeting.

J. The pavers shall be compacted and the bedding aggregates shall be swept into all joints and voice openings until they are full. The will require at least two or three passes with the compactor. Do not compact within three feet (3') of the unrestrained edges of the paving units.

K. All work to within three feet (3') of the laying face must be left fully compacted at the completion of each day.

L. Excess surface bedding and void opening aggregates shall be swept off when the job is complete.

M. The final surface elevations shall not deviate, as an example, more than ⅜" inch under a 10' foot long straight edge. Acceptable surface elevation deviations shall be specified by the Designing Engineer.

N. The surface elevation of pavers shall be ⅛" to ¼" inch above adjacent drainage inlets, concrete collars or channels.

3.4 CLEANING AND PROTECTION

A. Upon completion of work, all paver areas and adjacent areas shall be swept clean of all excess sand.

B. All permeable paver areas shall be protected with plastic sheeting over the entire area for the duration of the site and building construction. No construction materials shall be placed or stockpiled on the permeable pavers.

END OF SECTION LS 2780