



Note: The text must be edited to suit specific project requirements. It should be reviewed by a qualified civil or geotechnical engineer, or landscape architect familiar with the site conditions. Edit this specification term as necessary to identify the design professional in the General Conditions of the Contract. Available for download at www.EcoBrickBP.com

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Permeable interlocking concrete pavers.
2. Crushed stone bedding material.
3. Open-graded subbase aggregate.
4. Open-graded base aggregate.
5. Bedding and joint/opening filler materials.
6. Edge restraints.
7. [Geotextiles].

B. Related Sections

1. Section []: Curbs.
2. Section []: [Stabilized] aggregate base.
3. Section []: [PVC] Drainage pipes
4. Section []: Impermeable liner.
5. Section []: Edge restraints.
6. Section []: Drainage pipes and appurtenances.
7. Section []: Earthworks/excavation/soil compaction.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. C 67, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
2. C 131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
3. C 136, Method for Sieve Analysis for Fine and Coarse Aggregate.
4. C 140, Test Methods for Sampling and Testing Brick and Structural Clay Tile, Section 8 – Freezing and Thawing.
5. D 448, Standard Classification for Sizes of Aggregate for Road and Bridge Construction.
6. C 936, Standard Specification for Solid Interlocking Concrete Pavers.
7. C 979, Specification for Pigments for Integrally Colored Concrete.
8. D 698, Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 5.5-lb (2.49 kg) Rammer and 12 in. (305 mm) drop.
9. D 1557, Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 10-lb (4.54 kg) Rammer and 18 in. (457 mm) drop.
10. D 1883, Test Method for California Bearing Ratio of Laboratory-Compacted Soils.
11. D 4254, Standard Test Methods for Minimum Index Density and Unit



Weight of Soils and Calculation of Relative Density.

- C. Interlocking Concrete Pavement Institute (ICPI)
 - 1. Permeable Interlocking Concrete Pavement manual.

1.03 SUBMITTALS

- A. In accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
- B. Manufacturer's drawing and details: Indicate perimeter conditions, junction with other materials, expansion and control joints, paver [layout,] [patterns,] [color arrangement,] installation [and setting] details. Indicate layout, pattern, and relationship of paving joints to fixtures and project formed details.
- C. Minimum 1 lb samples of subbase, base and bedding aggregate materials.
- D. Sieve analysis of aggregates for subbase, base and bedding materials per ASTM C 136.
- E. Soils report indicating density test reports, classification, and infiltration rate measured on-site under compacted conditions, and suitability for the intended project.
- F. [Stormwater management (quality and quantity) calculations.]
- G. Eco-Brick Permeable concrete pavers:
 - 1. Product catalog sheets with specifications.
 - 2. [Four] representative full-size samples of each paver type, thickness, color, and finish.
 - 3. Accepted samples become the standard of acceptance for the work of this Section.
 - 4. Laboratory test reports certifying compliance of the concrete pavers with ASTM C 936.
- H. Paver Installation Subcontractor:
 - 1. A copy of Subcontractor's current certificate from the Interlocking Concrete Pavement Institute Concrete Paver Installer Certification program.
 - 2. Job references from projects of a similar size and complexity. Provide Owner/Client/General Contractor names, postal address, phone, fax, and email address.
 - 3. Written Method Statement and Quality Control Plan that describes material staging and flow, paving direction and installation procedures, including representative reporting forms that ensure conformance to the project specifications.

1.04 QUALITY ASSURANCE

- A. Paver Installation Subcontractor Qualifications:
 - 1. Utilize an installer having successfully completed concrete paver installation similar in design, material and extent indicated on this project.
 - 2. Utilize an installer holding a current certificate from the Interlocking Concrete Pavement Institute Concrete Paver Installer Certification program.
 - 3. Utilize an Installer insured for the amount of [_____].
- B. Regulatory Requirements and Approvals: [Specify applicable licensing,



bonding or other requirements of regulatory agencies.].

- C. Require pre-construction meeting of representatives from the manufacturer, paver installation subcontractor, general contractor, engineer and/or owner's representative.

- C. Mock-Ups:

1. Install a 10 ft x 10 ft (3 x 3 m) paver area.
2. Use this area to determine surcharge of the bedding layer, joint sizes, lines, laying pattern(s), color(s) and texture of the job.
3. This area will be used as the standard by which the work will be judged.
4. Subject to acceptance by owner, mock-up may be retained as part of finished work.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. General: Comply with Division 1 Product Requirement Section.
- B. Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged container packaging with identification tags intact on each paver bundle.
 1. Coordinate delivery and paving schedule to minimize interference with normal use of buildings adjacent to paving.
 2. Deliver concrete pavers to the site banded or wrapped cubes capable of transfer by forklift.
 3. Unload pavers at job site in such a manner that no damage occurs to the product or existing construction
- D Storage and Protection: Store materials in protected area such that they are kept free from mud, dirt, and other foreign materials.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Do not install in rain or snow.
- B. Do not install frozen bedding materials.

1.07 MAINTENANCE

- A. Extra materials: Provide an additional 5% of the selected paver material for use by owner for maintenance and repair.
- B. Pavers shall be from the same production run as installed materials.

PART 2 PRODUCTS

Note: Some projects may include permeable and solid interlocking concrete pavements. Specify each product as required.

- A. Manufacturer: Building Products Corporation
 1. Contact: Aron R Rauls, sales representative: 314-304-1754
- B. Permeable Interlocking Concrete Paver Units:
 1. Paver Type: Eco-Brick Permeable Paver
 - a. Material Standard: Comply with ASTM C 936.
 - b. Color [Specify color from Building Products Corp's full range].



c. Size: Nominal 5" x 10" x 3" [3-1/8", {80mm}] thick

Note: 60mm pavers not permitted on this project

2.02 PRODUCT SUBSTITUTIONS

A. Substitutions: Permitted, with approval 30days prior to original bid date.

2.03 CRUSHED STONE FILLER, BEDDING, BASE AND SUBBASE

A. Crushed stone with 90% fractured faces, LA Abrasion < 40 per ASTM C 131, minimum CBR of 80% per ASTM D 1883.

B. Do not use rounded river gravel.

C. All stone materials shall be washed with less than 1% passing the No. 200 sieve.

D. Joint/opening filler, bedding, base and subbase: conforming to ASTM D 448 gradation as shown in Tables 1, 2 and 3 below:

Note: No. 89 or finer gradation may be used to fill permeable pavers with narrow joints.

Table 1
ASTM No. 8 Grading Requirements
Bedding and Joint/Opening Filler

Sieve Size	Percent Passing
12.5 mm (1/2 in.)	100
9.5 mm (3/8 in.)	85 to 100
4.75 mm (No. 4)	10 to 30
2.36 mm (No. 8)	0 to 10
1.16 mm (No. 16)	0 to 5

Table 2
ASTM No. 57 Base
Grading Requirements

Sieve Size	Percent Passing
37.5 mm (1 1/2 in.)	100
25 mm (1 in.)	95 to 100
12.5 mm (1/2 in.)	25 to 60
4.75 mm (No. 4)	0 to 10
2.36 mm (No. 8)	0 to 5

Table 3
Grading Requirement for ASTM No. 2 Subbase

Sieve Size	Percent Passing
75 mm (3 in.)	100
63 mm (2 1/2 in.)	90 to 100
50 mm (2 in.)	35 to 70
37.5 mm (1 1/2 in.)	0 to 15
19 mm (3/4 in.)	0 to 5

E. Gradation criteria for the bedding and base:



Note: D_x is the particle size at which x percent of the particles are finer. For example, D_{15} is the particle size of the aggregate for which 15% of the particles are smaller and 85% are larger.

1. D_{15} base stone / D_{50} bedding stone < 5.
2. D_{50} base stone / D_{50} bedding stone > 2.

2.04 ACCESSORIES

A. Provide accessory materials as follows:

1. Edge Restraints *Note: cast-in-place curb and gutter, specified in another section.*
 - a. Manufacturer: [Specify manufacturer.].
 - b. Material: [Pre-cast concrete] [Cut stone] [Concrete].
 - b. Material Standard: [Specify material standard.].
2. Geotextile Fabric: *Note: See ICPI publication, Permeable Interlocking Concrete Pavements for guidance on geotextile selection. Geotextile use is optional.*
 - a. Material Type and Description: [Specify material type and description.].
 - b. Material Standard: [Specify material standard.].
 - c. Manufacturer: [Acceptable to interlocking concrete paver manufacturer]]

PART 3 EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. Paver installation contractors/subcontractors that meet the requirements set forth in section 1.03-H

3.02 EXAMINATION

A. Acceptance of Site Verification of Conditions:

1. General Contractor shall inspect, accept and certify in writing to the paver installation subcontractor that site conditions meet specifications for the following items prior to installation of interlocking concrete pavers.
 - a. Verify that subgrade preparation, compacted density and elevations conform to specified requirements.
 - b. Submit written density test results for soil subgrade to the Owner, General Contractor and paver installation subcontractor.
 - c. Verify location, type, and elevations of edge restraints, [concrete collars around] utility structures, and drainage pipes and inlets.
2. Do not proceed with installation of bedding and interlocking concrete pavers until subgrade soil conditions are approved or corrected by the



General Contractor or designated subcontractor.

3.03 PREPARATION

- A. Verify that the soil subgrade is free from standing water.
- B. Stockpile joint/opening filler, base and subbase materials such that they are free from standing water, uniformly graded, free of any organic material or sediment, debris, and ready for placement.
- C. Edge Restraint Preparation:
 - 2. Install edge restraints per the drawings [at the indicated elevations].

3.04 INSTALLATION

- A. General
 - 1. Any excess thickness of soil applied over the excavated soil subgrade to trap sediment from adjacent construction activities shall be removed before application of the [geotextile] and subbase materials.
 - 2. Keep area where pavement is to be constructed free from sediment during entire job. [Geotextiles] Base and bedding materials contaminated with sediment shall be removed and replaced with clean materials.
 - 3. Do not damage drainpipes, overflow pipes, observation wells, or any inlets and other drainage appurtenances during installation. Report any damage immediately to the project engineer.
- B. Geotextiles [Note: if specified]
 - 1. Place on bottom and sides of soil subgrade. Secure in place to prevent wrinkling from vehicle tires and tracks.
 - 2. Overlap a minimum of [0.3 in (12 in.)] [0.6 m (24 in.)] in the direction of drainage.
- C. Open-graded subbase and base
 - 1. Moisten, spread and compact the No. 2 subbase in 4 to 6 in. (100 to 150 mm) lifts [without wrinkling or folding the geotextile. Place subbase to protect geotextile from wrinkling under equipment tires and tracks.]
 - 2. For each lift, make at least two passes in the vibratory mode then at least two in the static mode with a minimum 10 t (10 T) vibratory roller until there is no visible movement of the No. 2 stone. Do not crush aggregate with the roller.
 - 3. The surface tolerance of the compacted No. 2 subbase shall be $\pm 2 \frac{1}{2}$ in. (± 65 mm) over a 10 ft (3 m) straightedge.
 - 4. Moisten, spread and compact No. 57 base in 100 mm (4 in.) lift over the compacted No. 2 subbase with a minimum 10 t (10 T) vibratory roller until there is no visible movement of the No. 57 stone. Do not crush aggregate with the roller.
 - 5. The surface tolerance the compacted No. 57 base should not deviate more than. ± 1 in. (25 mm) over a 10 ft (3 m) straightedge.
 - 6. The owner to arrange for compaction density testing per ASTM D 4254
- D. Bedding layer



1. Moisten, spread and screed the No. 8 stone bedding material.
 2. Fill voids left by removed screed rails with No. 8 stone.
 3. The surface tolerance of the screeded No. 8 bedding layer shall be $\pm 3/8$ in (10 mm) over a 10 ft (3 m) straightedge.
 4. Do not subject screeded bedding material to any pedestrian or vehicular traffic before paving unit installation begins.
- E. Eco-Brick Permeable interlocking concrete pavers and joint/opening fill material
1. Lay the Eco-Brick pavers in the Herringbone pattern and joint widths shown on the drawings. Maintain straight pattern lines.
 2. Fill gaps at the edges of the paved area with cut units. Cut pavers subject to tire traffic shall be no smaller than 1/3 of a whole unit.
 3. Cut pavers and place along the edges with a [double-bladed splitter or] masonry saw.
 4. Fill the openings and joints with [No. 8] stone.
 5. Remove excess aggregate on the surface by sweeping pavers clean.
 6. Compact and seat the pavers into the bedding material using a low-amplitude, 75-90 Hz plate compactor capable of at least 4,000 lbs (18 kN) centrifugal compaction force. This will require at least two passes with the plate compactor.
 7. Do not compact within 5 ft of the unrestrained edges of the paving units.
 8. Apply additional aggregate to the openings and joints, filling them completely. Remove excess aggregate by sweeping then compact the pavers. This will require at least two passes with the plate compactor.
 9. All pavers within 5 ft (2 m) of the laying face must be left fully compacted at the completion of each day.
 10. The final surface tolerance of compacted pavers shall not deviate more than $\pm 3/8$ (10 mm) under a 10 ft (3 m) long straightedge.
 11. The surface elevation of pavers shall be 1/8 to 1/4 in. (3 to 6 mm) above adjacent drainage inlets, concrete collars or channels.

3.05 FIELD QUALITY CONTROL

- A. After sweeping the surface clean, check final elevations for conformance to the drawings.
- B. Lippage: No greater than 1/8 in. (3 mm) difference in height between adjacent pavers.
- C. The surface elevation of pavers shall be 1/8 to 1/4 in. (3 to 6 mm) above adjacent drainage inlets, concrete collars or channels.

3.06 PROTECTION

- A. After work in this section is complete, the General Contractor shall be responsible for protecting work from sediment deposition and damage due to subsequent construction activity on the site.

END OF SECTION