Part 1 – General

1.01 Section Includes

A. Concrete Paver Units
B. Bedding and Joint Sand
C. Edge Restraints

1.02 Related Sections

Tech Data:

A. Glossary of Terms used in the production, Design, Construction, and Testing of interlocking Concrete Pavement – ICPI Tech Spec #1
B. Construction of Interlocking Concrete Pavement – ICPI Tech Spec #2
C. Edge Restraints for Interlocking Concrete Pavement – ICPI Tech Spec #3
D. Structural Designing of Interlocking Concrete Pavement for Roads and Parking Lots – Tech Spec #4
E. Cleaning and Sealing – Maintenance and Protection Guide – ICPI Tech Spec #5
F. Application Guide for Interlocking Concrete Pavements – ICPI Tech Spec #10

1.03 Referances

Note: Pavement subject to vehicles should be designed to consultation with a qualified civil engineer, in accordance with established flexible pavement design procedures, Pavespec Software, and in accordance with the ICPI "Tech Spec" Technical Bulletins.

A. American Society of Testing and Materials (ASTM):
   1. C 33. Specification for Concrete Aggregates.
   2. C 136. Method for Sieve Analysis.
   3. C 140. Sampling and Testing Concrete Masonry Units.
   4. C 144. Standard Specifications for Aggregate for Masonry Mortar.
   5. C 936. Specification for Solid Interlocking Concrete Paving Units.
   6. C 979. Specification for Pigments for Integrally Colored Concrete.
   7. D 698. Test Methods for Moisture Density Relations of Soil and Soil Aggregate mixtures using a 5.5 lb.(2.49kg) Rammer and 12 in (305mm) drop.
   8. D 1557. Test Methods for Moisture Density.
   9. D 2940. Graded Aggregate Material for Bases or Subbases for Highways or Airports.

B. Interlocking Concrete Pavement Institute (ICPI):
   1. Tech Spec Technicial Bulletins.

1.04 Qualify Assurance

A. Installation shall be by a contractor and crew with at least one year of experience in placing interlocking concrete pavers on projects of similar nature or dollar cost.
B. Contractor shall hold a currant certificate from the Interlocking Concrete Pavement Institute Concrete Paver Installer Certification program.
C. Contractor shall conform to all local, state/provincial licensing and bonding requirements.

1.05 Submittals

A. Shop or product drawing and product data.

B. Full size amples of concrete paving units to indicate color and shape selections. Color will be selected by Architect/Engineer/Landscape Architect/Owner from Manufacture's available colors.

C. Sieve analysis for grading of bedding and joint sand.

D. Test result from an independent testing laboratory for compliance of paving unit requirements to (ASTM C 936) (CSA) or other applicable requirements.

E. Indicate Layout, pattern, and relationship of paving joints to fixtures and project formed details

1.06 Mock-ups

A. Install a 7 ft. x 7 ft. (2 m x 2 m) paver area as described in Article 3.02.

B. This area will be used to determine surcharge of the bedding sand layer, joint sizes, lines, laying pattern(s), color(s), and texture of the job.

C. This area shall be the standard from which the work will be judged and it shall be incorporated into the work.

1.07 Delivery, Storage, and Handling

A. Deliver concrete pavers to the site in steel banded, or plastic banded, or plastic wrapped cubes capable of transfer by fork lift or clamp lift. Unload at job site in such a manner that no damage occurs to the product.

B. Cover sand with waterproof covering to prevent exposure to rainfall or removal by wind.

C. Coordinate delivery and paving schedule to minimize interface with normal use of building adjacent to paving.

1.08 Environmental Conditions

A. Do not install sand or pavers during heavy rain or snowfall.

B. Do not install sand or pavers over frozen base materials.

C. Do not install frozen sand.

Part 2 - Products

2.01 Concrete Pavers

A. Manufacturer:

TriCircle Pavers
2620 Jeffcott Street
Ft Myers, FL 33901
239-332-2325
239-332-0213 fax

B. Meet the following requirements set forth in ASTM C 938, Standard Specification for Interlocking Concrete Paving Units:

Note: If 3-1/8 in. (80mm) thick pavers are specified, their compressive strength test results should be adjusted multiplying them by 1.18 to equate the results to that from 2-3/8 in. (60mm) thick pavers.

1. Average compressive strength of 8,000 PSI (55 MPa) with no individual unit under 7,200 PSI (50 Mpa).
2. Average absorption of 5% with no unit greater than 7% when tested in accordance with ASTM C 140.
3. Resistance to 50 freeze-thaw cycles when tested according to ASTM C 67.

C. Pigment shall conform to ASTM C 979.

D. Product name(s), shape(s), overall dimensions, and thickness:

Blended

	Grey Base		White Base
114606	Antique Red/Yellow/Charcoal	356763	Creme/Carmel/Chocolate
623406	Chestnut/Buff/Charcoal	394606	Sunset/Yellow/Charcoal
0306	Pewter/Charcoal	406706	Malt/Carmel/Charcoal
1106	Antique Red/Charcoal	4167	Vanilla/Carmel
607706	Redwood/Coconut/Charcoal	4175	Vanilla/Foundation
6134	Brown/Buff	0106	White/Charcoal
6234	Chestnut/Buff	0176	White/Desert Sand
6706	Carmel/Charcoal	014177	White/Vanilla/Coconut
6711	Carmel/Antique Red	384606	Terra Cotta/Yellow/Charcoal
6763	Carmel/Chocolate	4067	Malt/Carmel
671106	Carmel/Antique Red/ Charcoal	4144	Vanilla/Sunkist
676265	Carmel/Chestnut/Coffee	403606	Malt/Sandstone/Charcoal
747706	Rust/Coconut/Charcoal	414403	Vanilla/Sunkist/Pewter
903506	Olive Green/Crème/Charcoal	416706	Vanilla/Carmel/Charcoal
		644666	Navajo/Yellow/Pueblo

Solid

	Grey Base		White Base
02	Grey	01	White
03	Pewter	13	Flamingo
06	Charcoal	34	Buff
11	Antique Red	35	Crème
24	Bergundy	36	Sandstone
60	Redwood	38	Terra Cotta
61	Brown	39	Sunset
62	Chestnut	40	Malt
63	Chocoloate	41	Vanilla
65	Coffee	44	Sunkist
66	Pueblo	46	Yellow
67	Carmel	64	Navajo
74	Rust	70	Cocoa
		71	Sedona
		75	Foundation
		76	Desert Sand
		77	Coconut

2.02 Bedding and Joint Sand

Note: The type of sand used for bedding is often called concrete sand. Sands vary regionally. Screenings and stone dust can be enevenly graded and have material passing the No. 200 (0.075mm) sieve. Bedding sands with these characteristics should not be used. Contact paver contractors or manufacturers local to the project and confirm sand(s) successfully used in previous similar applications.

A. Clean, non-plastic, free from Deleterious or foreign matter, natural or manufactured from crushed rock. Do not use limestone screenings or stone dust that do not conform to the grading requirements in Table 1. When concrete pavers are subject to vehicle traffic, the sands shall be as hard as practically available.

Note: If the hardness of the bedding sand is not sufficient or questionable for the application (usually a heavily trafficked thoroughfare) contact the ICPI for information and specifications on assessing bedding sand durability under heavy traffic loads.

B. Sieve According to (ASTM C 136) (CSA-A-A23.2A).

C. Conform to the grading requirements as shown in Table 1.

Note: Use ASTM or CSA standards as applicable.

Table 1

Grading Requirements for Bedding Sand

ASTM C 33		CSA A23. 1-M94	
SIEVE SIZE	PERCENT PASSING	SIEVE SIZE	PERCENT PASSING
3/8 in. (9.5mm)	100	10mm	100
NO. 4 (4.75mm)	95 to 100	5mm	95 to 100
NO. 8 (2.36mm)	85 to 100	2.5mm	80 to 100
NO. 16 (1.18mm)	50 to 85	1.25mm	50 to 90
NO. 30 (0.600mm)	25 to 60	0.630mm	25 to 65
NO. 50 (0.300mm)	10 to 30	0.315mm	10 to 35
NO. 100 (0.150mm)	2 to 10	0.160mm	2 to 10

Note: Bedding sand may be used for a joint sand. However, some extra effort in sweeping and Compacting the pavers may be required in order to completely fill the joints. If joint sand other than bedding sand is used, the gradations shown in Table 2 are recommended. Joint sand should never be used for bedding sand.

D. The joint sand shall conform to the grading requirements as shown in Table 2 below:

Note: Use ASTM or CSA standards as applicable.

Table 2

Grading Requirements for Bedding Sand

ASTM C 33	ASTM C 144	CSA A23. 1-M94

	Natural Sand	Manufactured Sand		
SIEVE SIZE	PERCENT PASSING	PERCENT PASSING	SIEVE SIZE	PERCENT PASSING
NO. 4 (4.75mm)	100	100	5mm	100
NO. 8 (2.36mm)	95 to 100	95 to 100	2.5mm	95 to 100
NO. 16 (1.18mm)	70 to 100	70 to 100	1.25mm	90 to 100
NO. 30 (0.600mm)	40 to 75	40 to 100	0.600mm	35 to 80
NO. 50 (0.300mm)	10 to 35	20 to 40	0.300mm	15 to 50
NO. 100 (0.150mm)	2 to 15	10 to 25	0.150mm	2 to 15
NO.200 (0.075mm)	0	0 to 10		

2.03 Edge Restraints

A. See ICPI Teck Spec #3. Edge Restraints for Interlocking Concrete Pavestones (Included In Tech Data Section) for guidance on selecting edge restraints for various applications.

B. See Details/Design Considerations in Tech Data Section.

Part 3 - Execution

3.01 Examination

Note: For installation on a compact aggregate base and soil subgrade, the specifier should be aware that the top surface of the pavers may be 1/8 to 1/4 in. (3 to 6mm) above the final elevation after compaction. This difference in initial and final elevation is to compensate for possible minor setting.

A. Verify that subgrade preparation, compacted density and elevations conform to the specifications.

Note: Compaction of the soil subgrade is recommended to at least 95% standard Proctor denisty per ASTM D 698 for pedestrian areas and residential driveways. Compaction to at least 95% modified Proctor density per ASTM D 1557 is recommended for areas subject to heavy vehicular traffic. Stabilization of the subgrade and/or base material may be necessary with weak or saturated subgrade soils. The Architect/Engineer should inspect subgrade preparation, elevation, and conduct density tests for conformance to specifications.

B. Verify that geotextiles, if applicable, have been placed according to specifications and drawings.

C. Verify that aggregate base materials, thickness, compaction, surface tolerance, and elevations conform to the specifications.

Note: Local aggregate base materials typical to those used for highway flexible pavements are recommended for those conforming to ASTM D 2940. Compaction is recommended to not less than 95% Proctor density in accordance with ASTM D 698 for pedestrian areas and residential driveways. Compaction is recommended to not less than 98% modified Proctor density according to ASTM D 1557

for vehicular areas.

Note: Tile aggregate base should be spread and compacted in uniform layers not exceeding 6 in. (150mm) thickness. Recommended base surface tolerance should be plus or minus 3/8 in. (10mm) over a 10 ft. (3m) straight edge. The Architect/Engineer should inspect geotextile materials and placement (if applicable), base preparation, surface tolerances, elevation, and conduct density tests for conformance to specifications. See ICPI Tech Spec 2, "Construction of Interlocking Concrete Pavement" for further guidance on construction practices.

Note: Mechanical tampers are recommended for compaction of soil subgrade and aggregate base around lamp standards, utility structures, building edges, curbs, tree wells and other protusions. In areas not accessible to large compaction equipment, compact to specified density with mechanical tampers.

D. Verify location type, installation and elevations of edge restraints around perimeter area to be paved.
E. Install edge restraints per the drawing [and manufaturer's recommendations] at the indicated elevations.
F. Verify that base is dry, uniform, even, and ready to support sand, pavers and imposed loads.
G. Beginning of bedding sand and paver installation means acceptance if base and edge restraints.

3.02 Installation

A. Spread the bedding sand evenly over the base course and screed to a normal 1 in. (25mm) thickness, not exceeding 1-1/2 in. (40mm) thickness. The screeded sand should not be disturbed. Place sufficient sand to stay ahead of the laid pavers. Do not use the bedding sand to fill depressions in the base surface.
B. Ensure that pavers are free of foreign material before installation.
C. Lay the pavers in the pattern(s) as shown in the drawings. Maintain straight pattern and joint lines.
D. Joints between the pavers shall be between 1/16 in. and 3/16 in. (2mm to 5mm) wide.

Note: Some paver shapes require a larger joint. Consult manufacturer for recommended joint widths.

E. Fill gaps at the edges of the paved area with cut pavers or edge units.

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

F. Cut Pavers to be placed along the edge with (a double blade paver splitter or) masonry saw.
G. Use a low-amplitude plate compactor capable of at least 5,000 lbf (22 kN) at a frequency of 75 hz-100 hz to vibrate the pavers into the sand.
H. Compact the pavers again, sweeping dry joint into the joints and vibrating until they are full. This will require at least two or three passes with the compactor. Do not compact within 3 ft (1m) of the unrestrained edges of the paving units.
I. All work to within 3 ft. (1m) of the laying lace must be left fully compacted with sand-filled joints at the end of each day. Cover the laying face with plastic sheets overnight if not

closed with cut and compacted pavers.

J. Sweep off excess sand when job is complete.

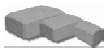
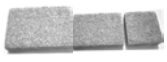
K. The final surface elevations shall not deviate more than 3/8 in. (10mm) under a 10 ft. (3m) long straight edge.

L. The surface elevation of pavers shall be 1/8 to 1/4 in (3 to 6mm) above adjacent drainage inlets, concrete collars or channels.

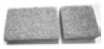
3.03 Field Control

A. After removal of excess sand, check final elevations for conformance to the drawings.

TriCircle Pavers

Paver Selection	Size	Thickness
	4x4	2.375"
	Euro Cobble	1 3/16", 2 3/8"
	4x8	1 3/16", 2 3/8", 3 1/8"
	6x9	2 3/8"
	8x8	2 3/8"
	9x12/Slate finish	2 3/8"
	12x12	1 3/16", 2 3/8"
	Cobble	2 3/8"
	Dekor	1 3/16", 2 3/8"
	Bishop Hat	2 3/8"
	Mariposa	2 3/8"
	Rosa	2 3/8"
	Mega Stone Selection	2 3/8"
	Bullnose Coping	2 3/8"
	Remodel Coping	1 3/16"

"Green" Selection

	Pervious 4x8	2 3/16"
	Pervious Euro Cobble	2 3/16"
	Pervious 6x9	2 3/16"
	EcoX	3 1/8"
	Turf Stone	3 1/8"
	5x10	2 3/16"