



icpi

Interlocking Concrete
Pavement Institute®

Permeable Interlocking Concrete Pavement - Inspection Checklist

March 9, 2015

Planning

Pre-construction meeting

- Walk through site with builder/contractor/subcontractor to review erosion and sediment control plan/stormwater pollution prevention plan or "SWPPP"
- Determine when PICP is built in project construction sequence; before or after building construction, and measures for PICP protection and surface cleaning
- Aggregate material stockpile locations identified (hard surface or on geotextile)
- Protect finished product from contamination

Detail drawings on the plans

- Decide material delivery location(s) and flow
- Manufactured edge pavers (if applicable)
- String or sailor course of pavers against curbs, and concrete collars for utility structures, trees wells, and other related structures
- Location and size of curb cut-outs
- Location elevation and size of underdrains (if applicable)

Submittals

Aggregate Analysis

- Subbase aggregate gradation
- Base Aggregate gradation
- Bedding Aggregate gradation
- Jointing aggregate gradation
- Other tests results (as required by specifications) e.g. hardness
- All tests/reports within past 12 months

Other Materials

- Samples of materials with documented physical properties that meet specifications
 - Edge Restraint (if possible)
 - Geotextiles
 - Geomembranes
 - Pipes

Permeable Interlocking Concrete Pavers

- Four paver samples
- Aspect ratio & thickness appropriate for application as specified by the design engineer
- Laboratory test results for ASTM C936 or CSA A231.2
- ASTM Compressive strength per ASTM C140: Average 8000 psi (55 MPa), min. 7200 psi (50 MPa)
- CSA cube/cylinder compressive strength at 7200 psi (50 MPa)
- Absorption per ASTM C140: Average no greater than 5%, min. no greater than 7%
- Freeze-thaw durability per ASTM C1645 or CSA deicing resistance test as appropriate

- ASTM optional abrasion durability per ASTM C418
- Manufacturer's product (cut) sheets for specified paver(s)
- Material Safety Sheet

Installer/Sub-contractor Documents

- Installer job references: minimum two references of jobs of similar size and complexity
- Current ICPI Certified Installer - PICP Specialist (full designation or at least Record of Completion): at least one person on-site with certificate (typically job foreman or crew leader)
- State/provincial, local licenses
- Contract specific insurances (liability, workers compensation, etc.), performance bonds

On Site Preparation

Mock-up

- Location, size, completion date
- Surcharge (settlement after plate compaction)
- Shows color range
- Joint widths per specs/manufacturer's literature
- Paver pattern(s) and direction per drawings

Storage

- Paver bundles with steel/plastic bands or plastic wrap
- Each paver cube labeled and numbered
- Paver cubes stacked up 2 high maximum on level ground
- Pavers should be kept off any unpaved ground surface by pallets, plywood, etc.
- Stockpile aggregate on hard surfaces or geotextile to prevent contamination from site soils and sediment

Sediment management

- Access routes for delivery and construction vehicles identified
- Vehicle tire/track washing station (if specified in Erosion & Sediment plan/SWPPP) location/ maintenance

Sediment management post-excavation

- Excavation hole as sediment trap: cleaned to final subgrade elevation immediately before subbase stone placement and runoff sources with sediment diverted away from the PICP,
- or
- All runoff diverted away from excavated area
 - Temporary soil stockpiles should be protected from run-on, run-off from adjacent areas and from erosion by wind
 - Ensure linear sediment barriers (if used) are properly installed, free of accumulated litter, and built up sediment less than 1/3 the height of the barrier
 - No runoff enters PICP until soils stabilized in area draining to PICP

Verify Site Conditions

Foundation Walls

- PICP should be installed no closer than 10 ft (3 m) from foundation walls with no waterproofing or consideration for subsurface drainage

Proximity to Water Supply

- PICP should be installed no closer than 100 ft (30 m) from municipal water supply wells or open water

Soil Subgrade

- Rocks & roots removed, voids refilled with aggregate & compacted
- No groundwater seepage or standing water
- If no compacted subgrade, confirm no compaction from construction equipment, scarify if needed
- Soil compacted as specified – verify soil density & infiltration (saturated hydraulic conductivity)

Verify Materials Delivered to the Site

Pavers

- Source on tags matches specification
- Dimensions match specification
- Colors match samples submitted and mock up
- Delivery amounts and dates recorded

Aggregates

- Sieve analysis from quarry and general appearance of subbase, base, bedding, and jointing aggregates conforms to specifications

Additional Materials

- Edge restraints matches specification
- Geotextile matches specification
- Geomembrane matches specification

Excavate and Construct Subbase & Base

Weather conditions

- No work in heavy rain or snow – bedding is not saturated
- No aggregates and pavers placed on frozen base or subgrade
- No frozen aggregates

Excavation

- Utilities located and marked by local service
- Excavated area marked with paint and/or stakes
- Excavation size and location conforms to plan
- Soil compaction as specified – verify soil subgrade infiltration (hydraulic conductivity) with testing

Geotextile (if specified)

- Placement and down slope overlap (min. 1 ft or 0.3 m) conform to specifications and drawings
- Sides of excavation covered with geotextile prior to placing aggregate base/subbase
- No tears or holes
- No wrinkles, pulled taught and staked

Geomembranes (if specified)

- Placement
- Field welding, seams, and seals at pipe penetrations done per specifications
- Top and bottom protected with non-woven geotextile (typ. 10 oz/sy)

Drain pipes, observations wells and cleanouts

- Size, perforations, locations, slope, and outfalls meet specifications and drawings
- Verify elevation of overflow pipes

Subbase, base and bedding aggregates

- Spread (not dumped) with a front-end loader to avoid aggregate segregation
- Storage on hard surface or geotextile to keep sediment-free
- Thickness, placement, compaction and surface tolerances meet specifications and drawings
- Subbase and base compaction equipment meets specifications
- Subbase and base stiffness testing for consistency
- Bedding layer screeding: not compacted using various installation methods (manual & powered)

Edge restraints

- Elevation, placement meet specifications and drawings

Install Permeable Interlocking Concrete Pavement

Paver installation

- Elevations, slope, laying pattern, joint widths, and placement/compaction meet drawings and specifications
- No cut paver subject to tire traffic is less than 1/3 of a whole paver
- Six passes: min. 5,000 lbf (22 kN) plate compactor (or 2 passes w/ min. 10,000 lbf (44 kN) plate compactor)
- All pavers within 2 m or 6 ft of the laying face fully compacted at the completion of each day
- Surface tolerance of compacted pavers deviate no more than ± 10 mm (3/8 in.) under a 3 m (10 ft) long straightedge

Jointing Aggregate

- Remove any aggregate from the pavement surface before compacting pavers and vibrating jointing aggregate
- Broken and chipped pavers marked, removed and replaced after initial compaction
- Alternate sweeping and vibrating sand into joints with minimum of 6 passes of plate compactor
- No compaction within 6 ft (2 m) of an unrestrained edge of pavers
- All pavers compacted within 6 ft (2 m) of the laying face at the end of each day

Quality Control

- Surface elevation of pavers 1/8 to 3/8 in. (3 to 10 mm) above edge restraints, drainage inlets, concrete collars, or channels (for non-ADA accessible paths of travel); to 1/4 in. or 6 mm (for ADA accessible paths of travel)
- Surface elevations conform to drawings
- Pavers 1/8 to 1/4 in. (3 to 6 mm) above curbs, inlets, concrete collars and channels
- Lippage: no greater than 1/8 in. (3 mm) difference in height between adjacent pavers
- Bond (joint lines) lines: $\pm 1/2$ in. (15 mm) over 50 ft. (15 m) string line
- Check filling of joints with sand with putty knife: max 1/4 in. (6 mm) below chamfer edge at completion. Fill and re-compact if necessary

Finished Project

Final inspection

- Surface swept clean
- Elevations and slope(s) conform to drawings
- Transitions to impervious paved areas separated with edge restraints
- Stabilization of soil in area draining into permeable pavement (min. 20 ft or 6 m wide vegetative strips recommended)
- Drainage swales or storm sewer inlets for emergency overflow. If storm sewer inlets are used, confirm overflow drainage to them
- Runoff from non-vegetated soil diverted from PICP surface
- Test surface for infiltration rate per specifications using ASTM C1781; minimum 100 in./hr (254 cm/hr) recommended

Maintenance Pavers

- Delivery location, date and time
- Verify amount delivered

Protection

- General contractor to protect paver area after paver installation subcontractor completes work and leaves site