

**SECTION 32 14 13.16
CONCRETE PAVING SLABS ON
PEDESTALS FOR ROOF PLAZA DECKS**

*[NOTE TO SPECIFICATION WRITER: This guide specification is for paving slabs supported by pedestals for pedestrian roof plaza decks. Slabs installed with these methods are not recommended for areas subject to vehicular traffic. **The text must be edited to suit specific project requirements.** This Section includes the term "Architect." Edit this term as necessary to identify the design professional in the General Conditions of the Contract. Roof and deck slab pavements should be designed in consultation with a qualified civil engineer, in accordance with established pavement design procedures and in accordance with the Interlocking Concrete Pavement Institute (hereinafter ICPI) technical bulletins.]*

PART 1 GENERAL

1.01 DESCRIPTION

- A. Work shall consist of constructing a [BLU GRANDE] [INDUSTRIA SLAB] [PARA 500 X 750] Concrete Paving Slab on pedestals for roof plaza decks, including furnishing of all materials, labor, equipment, testing and inspection, in accordance with these specifications and the construction drawings. The work in this section consists of, but is not limited to, the following:

[Furnishing and placement of pedestals.]

[Furnishing and placement of concrete paving slabs.]

[Furnishing and placement of Cleaners, sealers, if required]

1.02 RELATED SECTIONS

- A. Section 01 33 00 – Submittals Procedures
B. Section 07 50 00 – Membrane Roofing
C. Section 22 14 26.13 – Roof Drains
D. Section 07 72 00 – Roof accessories
E. Section 07 22 00 – Roof and deck insulation
F. Section 07 62 00 – Sheet Metal Flashing and Trim

1.03 REFERENCE DOCUMENTS

- A. Canadian Standards Association (CSA)
1. CSA A231.1, Precast Concrete Paving Slabs.
2. CSA A23.1/A23.2 – Concrete materials and methods of concrete construction / Test methods and standard practices for concrete
- B. American Society for Testing and Materials (ASTM)
1. Slab Units
a. ASTM C 979 Standard Specification for Pigments for Integrally Colored Concrete
2. Pedestals
a. ASTM E 108 – Standard Test Methods for Fire Tests of Roof Coverings
- C. Interlocking Concrete Pavement Institute (ICPI)
a. Tech Spec technical bulletins
- D. UL standards

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- a. UL 790 – Tests for Fire Resistance of Roof Covering Materials (equivalent to ASTM E 108)
- E. The [Architect] shall make the final determination where specifications and reference documents conflict.

1.04 SUBMITTALS/ CERTIFICATION

- A. In accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
- B. Shop drawings and details: Indicate perimeter conditions, relationship to adjoining materials and assemblies, [expansion and control joints,] concrete paving slab [layout,] [patterns,] [color arrangement,] installation [and setting] details.
- C. Concrete paving slabs:
 - 1. [Four (4)] representative full-size samples of each slab type, thickness, color, finish. Select samples to indicate the extremes of color and texture expected in the finished installation.
 - 2. Accepted samples become the standard of acceptance for the work in this Section.
 - 3. Laboratory test reports certifying compliance of the paving slabs with CSA A231.1.
 - 4. Manufacturer's catalog literature and safety data sheets for the safe handling of the specified materials and products.
- D. Pedestal System:
 - 1. [Four (4)] pedestal samples.
 - 2. Submit manufacturer's data sheets on each product to be used, including:
 - a. Preparation instructions and recommendations.
 - b. Storage and handling requirements and recommendations.
 - c. Installation methods.
 - 3. Submit shop drawings detailing the installation methods. Coordinate placement with locations noted on the Contract Drawings.

1.05 QUALITY ASSURANCE

- A. Paving Subcontractor Qualifications:
 - 1. Utilize an installer having successfully completed concrete paving slab installation similar in design, material, and extent indicated on this project.
 - 2. It is recommended to use an installer holding a current certificate from the Interlocking Concrete Pavement Institute Certified Concrete Paver Installer program.
- B. Regulatory Requirements and Approvals: [Specify applicable licensing, bonding or other requirements of regulatory agencies].
- C. Mock-Ups:
 - 1. Install a 2 x 2 m (7 ft x 7 ft) area.
 - 2. Use this area to determine pedestal height and shimming requirements, 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 the [Architect], mock-up may be retained as part of finished work.
 - 5. If mock-up is not retained, remove and properly dispose of mock-up.

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1.06 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 containers packaging with identification labels intact. Inspect all delivered materials to insure they are undamaged and in good condition.
 - 1. Coordinate delivery and paving schedule to minimize interference with normal use of buildings, streets and sidewalks adjacent to paving installation.
 - 2. Deliver concrete paving slabs to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.
 - 3. Unload slabs at job site in such a manner that no damage occurs to the product.
 - 4. Evenly disperse bundled material on structural areas to eliminate point load overloading.
- D. Storage and Protection: Store materials protected such that they are kept free from mud, dirt, and other foreign materials. [Store concrete paving slab cleaners and sealers per manufacturer's instructions.]

1.07 PROJECT/SITE CONDITIONS

- A. Environmental Requirements:
 - 1. Do not install pedestals and slabs during heavy rain or snowfall.
 - 2. Install pedestals free of standing water or ice.
- B. Do not exceed structural capacity of roof.
- C. Concrete paving slabs and support pedestal system specified are to be used with pedestrian traffic only.
- D. Restraint concrete paving slabs by perimeter blocking or walls on all sides.
- E. Confirm that substrates below the support pedestal system have positive drainage.
- F. Do not install pedestals over any roofing insulation with a density of less than 414 kPa (60 psi).

1.08 MAINTENANCE

- A. Extra Materials: Provide [Specify area] [Specify percentage] additional material for use by [Owner] for maintenance and repair including pedestals.
- B. Slabs shall be the same production run as installed materials.

PART 2 PRODUCTS**2.01 CONCRETE PAVING SLABS**

- A. Manufacturer: Techo-Bloc
- B. Concrete paving slabs name, height, width and length:

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[Blu Grande (60 mm x 495 mm x 825 mm) (2 3/8" x 19 1/2" x 32 1/2")]
 [Industria Slab (60 mm x 600 mm x 600 mm) (2 3/8" x 23 5/8" x 23 5/8")]
 [Para 500x750 (60 mm x 500 mm x 750 mm) (2 3/8" x 19 11/16" x 29 1/2")]
 [Blu Grande (polished) (58mm x 495 mm x 825 mm) (2 5/16" x 19 1/2" x 32 1/2")]
 [Industria Slab (polished) (58mm x 600 mm x 600 mm) (2 5/16" x 23 5/8" x 23 5/8")]

- C. Substitutions: No substitutions permitted.
- D. Provide paving slabs meeting the minimum physical requirements set forth in CSA A231.1:
1. Average Flexural strength ≥ 5.0 MPa, with no individual strength value less than 4.5 MPa.
 2. Resistance to freezing and thawing
 - a. For architectural finishes (Granitex and Polished):
 - Loss of mass after 28 cycles: 500 g/m² (max), or
 - Loss of mass after 49 cycles: 1200 g/m² (max)
 - b. For other finishes:
 - Loss of mass after 28 cycles: 300 g/m² (max), or
 - Loss of mass after 49 cycles: 800 g/m² (max)
 3. Dimensional tolerances:
 - a. Length and width: -1.0 to +2.0 mm
 - b. Height: ± 3.0 mm
 - c. Warpage:
 - Dimension ≤ 450 mm: ± 2.0 mm
 - Dimension > 450 mm: ± 3.0 mm
 4. Color: [specify according to product]
 5. Finish: [specify according to product]
- E. Center point load capacity of slab on pedestal set with a Safety Factor of 2:
- [Blu Grande: 352 kg (776 lbs)]
 - [Industria: 653 kg (1441 lbs)]
 - [Para 500x750: 514 kg (1135 lbs)]
- F. Efflorescence: evidence of efflorescence is not a cause for rejection.

[NOTE TO SPECIFICATION WRITER: Verify the delivery dates to ensure the availability of the products required for the execution of work.]

Efflorescence is a whitish powder-like deposit that sometimes appears on concrete. It does not affect the structural integrity of concrete paving units in any way. During the hydration of cement, calcium hydroxide and other water-soluble salts form or are present. Water held in the pores of hardened cement paste is saturated with these materials. When the pore solution diffuses to the external surface of concrete, the dissolved salts remain as a white deposit after evaporation of the water. Calcium hydroxide on the surface reacts with carbon dioxide from the atmosphere to form calcium carbonate. Calcium carbonate is difficult to wash off with water. However, the efflorescence will usually wear off over time and it is advisable to wait a few months before attempting to remove any efflorescence. It can be removed with commercially available cleaners provided directions are carefully followed. Some cleaners can contain acid that can expose aggregate on the concrete surface and alter the color of the paving units.]

2.02 PEDESTALS

- A. Provide pedestals as follows:
- a. Manufacturer: [Specify manufacturer]
 - b. Material: [Specify material]

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- c. Material Standard: [Specify material standard]
- B. Compression resistance: Pedestal system shall be capable of withstanding minimal breaking loads up to 1000 kg (2204 lbs) per pedestal.

2.03 CLEANERS, SEALERS

- A. Provide [cleaner] [sealer] as follows:
 - a. Material Type and Description: [Specify material type and description]
 - b. Manufacturer: [Specify manufacturer]
 - c. Material Standard: [Specify material standard]

[NOTE TO SPECIFICATION WRITER: The use of cleaners and sealers is optional depending on project needs.]

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas indicated to receive pedestal bases [with Installer present] for compliance with requirements for installation tolerances and other conditions affecting performance before placing concrete paving slabs.
- B. Verify location, type, and elevations of edge restraints, drains, drain holes, holes and inlets.
- C. Verify that roof deck materials, thickness, surface tolerances and elevations conform to specified requirements.
- D. Verify that all surfaces, membrane(s), protection board, insulation, drains, are free from dirt, oil, grease or any deleterious substances and debris which may prevent installation, drainage, and stability of the paving slab installation.
- E. Do not begin paving work until substrates have been properly prepared to the [Architect's] satisfaction and are ready to receive leveling materials and paving slabs. Setting of pedestals signifies acceptance of building roof membrane and protection board substrates.
- F. If substrate preparation is the responsibility of another installer, notify [Architect] of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

- A. Install pedestals in accordance with manufacturer's recommendations. Securely place base supports at locations shown on shop drawings.
- B. Locate pedestals at the proper elevation and placed in position prior to the installation of paving slabs.
- C. Reference manufacturer Installation Details documentation for adjustment procedures such as shimming a pedestal or adjusting the slope compensation on the pedestal.

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- D. Place paving slabs on pedestals so they are supported according to pedestal manufacturer's recommendations.
- E. Align pedestals in all directions and shim elevations of slabs as work progresses and according to the manufacturer's recommendations.
- F. Make final slight adjustments to pedestals as they are fully loaded by paving slabs.
- G. Ensure pedestals are maintained in a straight and consistent pattern and that installed paving slabs are level and do not rock back-and-forth under loading.
- H. Trim and remove uncovered portion of pedestals to fit tightly with slabs against parapets, walls, and protrusions in the roof. Cut paving slabs with a masonry saw to fit in these areas. Cut slabs without damage to exposed faces and edges. [Cut units shall be no smaller than $[1/2]$ of a whole slab.] [Cut paving slabs as indicated on the drawings.]
- I. Maintain consistent joint widths and joints aligned in all directions as indicated on the drawings.
- J. Do not install cracked or broken paving slabs.
- K. Remove cut pieces and other debris from the surface and on the roof deck. Sweep slab surfaces clean.
- L. Contain the paving slabs that are not restrained by an abutting wall. No movement shall be allowed at the perimeter of the roof decking greater than 3 mm ($1/8$ in.).

[NOTE TO SPECIFICATION WRITER: Some bituminous waterproofing membranes are subject to softening at high ambient temperatures. Protection board is recommended in such situations under pedestal systems to decrease point load pressure on the membrane. Check with the membrane manufacturer for compatibility between the membrane and pedestals. Revise specification to include protection board as required.]

3.03 FIELD QUALITY CONTROL

- A. Check final surface elevations for conformance to drawings.
- B. Lippage: Maximum 1.5 mm ($1/16$ in.) height variation between adjacent paving slabs.

[NOTE TO SPECIFICATION WRITER: Cleaning and sealing may be required for some applications. See ICPI Tech Spec 5, Cleaning and Sealing Interlocking Concrete Pavements for guidance on when to clean and seal the slab surfaces. Delete article below if cleaners and sealers are not applied.]

3.04 [CLEANING] [SEALING]

- A. [Clean] [Seal] concrete slabs in accordance with the manufacturer's written recommendations.

3.05 PROTECTION

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