ICC-ES Evaluation Report

ESR-2884P

Reissued October 2024

Revised February 2025

Subject to renewal October 2026

This report also contains:

- City of LA Supplement
- CA Supplement
- FL Supplement

DIVISION: 06 00 00 — WOOD, PLASTICS AND COMPOSITES **Section: 06 52 00 — Plastic Structural Assemblies** **DIVISION: 07 00 00 — THERMAL AND MOISTURE PROTECTION** **Section: 07 76 00 — Roof Pavers**	**REPORT HOLDER:** **UNITED CONSTRUCTION PRODUCTS dba BISON INNOVATIVE PRODUCTS**	**EVALUATION SUBJECT:** **BISON DECK SUPPORTS SYSTEMS**	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021, 2018, 2015, and 2012 *International Building Code*® (IBC)

Properties evaluated:

- Structural
- Durability
- Fire classification
- Seismic resistance
- Wind resistance

2.0 USES

The Bison Deck Supports Systems are raised-deck (elevated flooring) systems installed over new and existing construction with a noncombustible roof deck; new and existing code-complying classified roof covering assemblies over a noncombustible roof deck; or on grade applications.

3.0 DESCRIPTION

3.1 General:

Each raised-deck (elevated flooring) system consists of either wood tile pavers, concrete/stone slab pavers, concrete/stone slab pavers bonded to Bison Paver Trays, or 2CM pavers bonded to Bison Paver Trays supported by plastic pedestals placed directly on the roof assembly or on grade, to provide a level walking surface. The bases of the pedestals are not required to be mechanically fastened or adhesively attached to the supporting structure, while select systems require that a ledger must be positively attach to the perimeter

of the supporting structure to resist the superimposed paver uplift reaction loads. See Figures 1 and 2 for details. Seismic systems require specific components and accessories designed to resist seismic loads. See Figures 14 through 17.

3.2 Materials:

3.2.1 Bison Wood Tiles:

The Bison Wood Tiles are manufactured from naturally durable wood species as identified under the approved quality documentation. Each tile is made from varying plank sizes, ranging from 0.79 inches by 2.46 inches (20 mm by 62.5 mm) to 0.82 inches by 4.69 inches (21 mm by 119.0 mm) with varying bottom brace wood member, ranging from 0.75 inches by 2.69 inches (19 mm by 68.3 mm) to 0.91 inches by 3.54 inches (23 mm by 90.0mm), where the overall deck tile typically comes in nominal 24 inches by 24 inches (609.6 mm by 609.6 mm), 24 inches by 48 inches (609.6 mm by 1219.2 mm), and 24 inches by 72 inches (609.6mm by 1828.8mm), with nominal overall thickness varying from 1.69 inches (43 mm) to 1.85 inches (47 mm). Each tile has an overall weight varying from 3.5 pounds per square foot (17.1 kg/m^2) to 7 pounds per square foot (34.2 kg/m^2). The tiles come in either standard smooth or custom ordered ribbed profiles and are available in brown, golden brown, and reddish-brown colors. See Figure 3 through 5 for details.

3.2.1.1 Surface Burning Characteristics:

When tested in accordance with ASTM E84, the Bison Wood Tiles, offered in Garapa, Ipe, Fijian Mahogany, and Massaranduba, have a flame-spread index of 75 or less and a smoke-developed index of 450 or less.

3.2.2 Concrete Pavers

Concrete pavers shall meet the following minimum physical and performance requirements. Each concrete paver shall come in a nominal overall thickness varying from 1.75 inches (44 mm) to 2.50 inches (63.5 mm); and weigh a minimum 21.5 pounds per square foot (105 kg/m^2) to maximum 26.5 pounds per square foot (129.3 kg/m^2); and shall have a minimum compressive strength of 6,000 psi (41.4 MPa) in accordance with ASTM C39.

Stone slab pavers shall meet the following minimum physical and performance requirements. Each stone slab paver shall come in a nominal overall thickness varying from 1.75 inches (44 mm) to 2.50 inches (63.5 mm); and weigh a minimum 21.5 pounds per square foot (105 kg/m^2) to maximum 26.5 pounds per square foot (129.3 kg/m^2); each paver shall have a minimum compressive strength of 12,000 psi (82.7 MPa) in accordance with ASTM C170 and a minimum modulus of rupture of 2000 psi (13.8 MPa) in accordance with ASTM C99. The values shall be based on the lowest values obtained testing parallel and perpendicular to bed under wet and dry conditions.

3.2.3 Bison 2CM Pavers

The Bison 2CM pavers meet the following minimum physical and performance requirements. Each Bison 2CM porcelain paver comes in a nominal overall thickness of 0.73-inches (18.4 mm) to 0.85 inches (21.6 mm); and weighs 9.0 pounds per square foot (43.9 kg/m^2) to 13.0 pounds per square foot (63.5 kg/m^2). Each 2CM paver has a minimum ultimate flexural strength of 6,000 psi (41.4 MPa) in accordance with ASTM C1161; a minimum breaking strength of 3,000 lbs (13.34 kN) in accordance with ASTM C648, and a minimum wet Dynamic Coefficient of Friction (DCOF) value of 0.42 in accordance with ANSI 137.1.

3.2.4 Bison Paver Tray

Each Bison Paver Tray consists of G90 Galvanized 20 ga sheet steel formed into standard nominal sizes, and have a minimum 0.037-inch (0.94 mm) thickness conforming to ASTM A653 CS Type B (G90 galvanized coating). See Figure 6 for standard sizes.

Each Bison Paver Tray is field-adhered to a Bison 2CM paver or concrete/stone slab paver using a polyurethane adhesive sealant, as required by Bison Innovative Products, Inc.

3.2.5 Bison Pedestals and Accessories:

The Bison Pedestals are available in three different models: Versadjust, ScrewJack and Level.It. Each pedestal consists of plastic support base, plastic vertical structural element, and plastic load bearing top cap; and are installed with a variety of accessories used to provide lateral bracing, vertical support, slope leveling compensation, and tile restraint to the top cap. Each component (pedestal and accessory) is a molded high-density copolymer polypropylene product. The pedestals, when used in the raised-deck (elevated flooring) systems, are adjustable with pedestal heights ranging from 1¼ inches (31.8 mm) to 36 inches (914.4 mm). Low height pedestals range from 1/8-inch (3.2 mm) to 2 inches (50.8 mm). See Figures 10 through 13 for details.

For raised-deck system heights between 24 inches (609.6 mm) to 36 inches (914.4 mm), Bison lateral bracing must be installed. See Figures 13 for details.

3.2.5.1 Plastic Material Burning Characteristics

The plastic material is available in two formulations: B-PP-2025 resin and B-PP-FR resin: The B-PP-2025 resin complies with the Class CC2 specifications in accordance with IBC 2606.4; and the B-PP-FR resin complies with the Class CC1 specifications in accordance with IBC Section 2606.4. The B-PP-2025 resin and B-PP-FR Resin plastic materials have a self-ignition temperature of greater than 650° F (343°C).

4.0 DESIGN AND INSTALLATION

4.1 Installation:

Installation of the Bison Deck Supports System must comply with this report and the manufacturer's published installation instructions and applicable provisions shown in Section 5.0 of this report. For installations under the 2024 IBC, the Bison Deck Supports System must also comply with 2024 IBC Sections 1511.9.1, 1511.9.5 and 1511.9.6. The manufacturer's published installation instructions must be available at the jobsite at all times during installation. When the manufacturer's published installation instructions differ from this report, the more restrictive requirement governs.

The Bison Deck Supports System must be installed on roofs with a maximum slope of 1:12 (8 percent slope) and must be installed over new and existing construction with a code-complying noncombustible (concrete or metal) roof deck; or over new and existing code-complying classified roof covering installed over a noncombustible (concrete or metal) roof deck where the Bison Deck Supports System shall have the same code-complying classification as the roof covering; or over on-grade applications.

Prior to installation, layout of the pedestals must be predetermined, cavity heights at all thresholds, low points such as drainage locations, etc. and high points must be measured. Installation using the "T" Method may be used on any Bison pedestal model with any paver, slab paver, paver tray, or wood tile to help maintain a square installation. After the thickness of the roof decking materials has been determined, the top of the pedestal elevation is marked around the deck with chalk line or laser level. The pedestals are screw-adjustable or shimmed to the correct height and level; and may be installed in a "T" shape layout, starting from threshold or high point. After completely installing the initial pavers/tiles and pedestals in a "T" shape, the rest of the pavers and pedestals in the field can be installed until the roof deck is completely infilled to perimeter containment points. At low elevation placement, low height pedestals and shims can be used. At diagonal or radial perimeter conditions, use extra pedestals under small cut pavers / tiles for additional support, where pedestal bases may be trimmed to scoreline, as applicable. Pavers/tiles must not be spaced more than $^{3}/_{16}$-inch (4.5 mm) from the perimeter containment. Tabs must maintain spacing between pavers or wood tiles when conditions require removing or modifying tab spacers in the field.

Bison Paver Trays are adhered in the field by the contractor/installer. Bison Paver Trays and Bison 2CM paver or concrete/stone slab pavers must be clean and dry prior to applying a polyurethane adhesive/sealant as specified in the ICC-ES approved quality control documentation, such that surfaces are free from grease, oil, water, dirt, and other contaminates. Adhesive must be applied first to the Bison Paver Trays prior to adhering to pavers. Bison Paver Trays are then adhered to the appropriate Bison 2CM pavers or concrete/stone slab pavers sizes. For adhesive application details see Figure 8.

Typical nominal Bison Paver Tray size (length and width) is adhered to an equal nominally sized Bison 2CM paver or concrete/stone slab paver (length and width). See Figure 6 for allowable paver sizes (lengths and widths).

Similarly, Bison Paver Trays may be adhered in combinations side by side to support larger Bison 2CM pavers or concrete/stone slab pavers. See Figure 7 for details.

Adhesive shall cure for 24 hours oriented with the paver on top such that the paver weight is applied to the tray. Cure prior to allowing foot traffic on pavers.

Each Bison Paver Tray may be cut or trimmed prior to or after adhesion (fully cured) with concrete/stone slab paver or Bison 2CM paver to fit when necessary, being sure to maintain a clean and dry surface as detailed herein. If cutting a bonded paver and tray assembly, be sure to reseal cut edge with same adhesive sealant following the same requirements above. See Figure 9 for details of installing the FS-12 spline with paver trays.

4.2 Design Loads:

See Table 1 for design loads for the Bison Deck Supports Systems which include: Bison Wood Tiles, as described in Section 3.2.1, concrete pavers described in Section 3.2.2, concrete or stone slab pavers adhered to Bison Paver Trays, as described in Sections 3.2.2 and 3.2.4, or Bison 2CM pavers adhered to Bison Paver

Trays, as described in Sections 3.2.3 and 3.2.4. See Tables 2A and 2B for the allowable pedestal axial load capacities for each pedestal model.

4.3 Fire Classification:

4.3.1 New and Existing Construction with a Noncombustible Roof Deck: The raised-deck (elevated flooring) system with Bison Wood Tiles, installed in accordance with Section 4.1 of this report, is recognized as a Class A roofing assembly in accordance with IBC Section 1505 (ASTM E108).

4.3.2 New and Existing Classified Roof Covering with a Noncombustible Roof Deck: The raised-deck (elevated flooring) system with concrete pavers, stone slab pavers, Bison 2CM pavers weighing a minimum 9 pounds per square foot (43.9 kg/m^2) and installed in accordance with Section 4.1 of this report, is recognized as a Class A roofing assembly in accordance with IBC Section 1505 (ASTM E108).

4.4 Seismic Resistance:

Seismic design and installation details of the Bison Deck Support System, with either Bison Wood Tiles or concrete pavers, is based in accordance with IBC Section 1613, Section 13.2.5 of ASCE 7, and Section 6.0 of the ICC-ES Acceptance Criteria for Seismic Qualification by Shake-table Testing of Nonstructural Components (AC156), where the Required Response Spectrum (RSS) shall be based on the maximum value of the design spectral response accelerations (S_{DS}), for which recognition is sought.

4.4.1 Assemblies:

The Bison Deck Supports Seismic System must be installed on roofs with a maximum slope of ¼:12 (2 percent slope) and must be installed over new and existing construction with a code-complying noncombustible (concrete or metal) roof deck; or over new and existing code-complying classified roof covering, such as an ethylene propylene diene monomer (EPDM) or thermoplastic polyolefin (TPO) membrane, installed over a noncombustible (concrete or metal) roof deck. Bison Wood Tiles (max. 6.0 psf) (29.3 kg/m^2) and concrete pavers (21.5 to 26.5 psf) (105 kg/m^2 to 129.3 kg/m^2) are approved for installation in areas with a flat roof snow load not exceeding 35 psf. Pedestals typically do not have positive attachment to the supporting structure and must be placed in a maximum 24 inches x 24 inches (609.6 mm x 609.6 mm) on-center grid. Paver-size is limited to no more than a nominal 24 inches x 24 inches with minimum cut tile/paver dimension of 8 inches (203.2 mm) along the perimeter.

The system can be used with either Versadjust or ScrewJack pedestals, with the option to use either Bison Wood Tiles, or concrete pavers. The system is valid at Versadjust pedestal heights 1 ¼ inches to 17 ½ inches (31.8 mm to 444.5 mm) when measured from the top finish surface of the approved roofing material, to the underside of the paver/tile while ScrewJack pedestal heights range from 1 ¼ inches to 6 inches (31.8 mm to 152.4 mm). Bracing between pedestal bases is provided by the Bison BB-Brace, and BB-Pegs for member connections. A second level of bracing is required when Versadjust pedestal heights exceed 8 inches, using the BB-Brace and BB-C; see Figure 13 for details.

Bison Deck Support System with Level.It pedestals have not been evaluated for installation in Seismic Design Categories, C, D, E and F and having a component importance factor greater than 1.0.

4.4.1.1 Bison Wood Tile Seismic Systems:

4.4.1.1.1 Bison Wood Tile Seismic System with perimeter fastening for each 3x3 group and at curb boundary: S_{DS} = 2.0g at z/h = 1.0: Installation of the seismic system with Bison Wood Tiles requires the use of the FS-2 fastening kit with Bison Wood Tile which includes a metal compression washer with an outside diameter of 1½-inches (38.1 mm), an inner diameter of 0.22-inch (5.6 mm), and a minimum 17 gauge thickness (0.057 inches / 1.45 mm) with a #8 x 1^5/$_8$-inch-long (41.3 mm) Hi-Low cement board screw. These must be installed at all interior tile corner joints engaging compression washer into the tile's kerf. All perimeter wood tile joints, which must bear over a pedestal, must be fastened with #8 x 2½-inch-long (63.5 mm) composite deck screws through Bison Wood Tile into the pedestal below. See Figures 14 and 15 (details 1 and 2) for FS-2 fastening kit connection and perimeter screw layout. All installations with the Seismic Design Categories A through F will have an additional fastening requirement, where composite deck screws must also be fastened to pedestals within the field of each 3x3 tile group, as detailed in Figures 14 and 15 (details 1 and 3). Piloting a countersunk hole in Bison Wood Tiles is strongly recommended before driving in #8 x 2½-inch long (63.5 mm) composite deck screws.

4.4.1.1.2 Bison Wood Tile Seismic System with perimeter fastening at curb boundary only: S_{DS} = 0.53g at z/h = 1.0: Installation of the seismic system with Bison Wood Tiles requires the use of the FS-2 fastening kit with Bison Wood Tile which includes a metal compression washer with an outside diameter of 1½-inches (38.1 mm), an inner diameter of 0.22-inch (5.59 mm), and a minimum 17 gauge thickness

(0.057 inches / 1.45 mm) with a #8 x $1^5/_8$-inch long (41.3 mm) Hi-Low cement board screw. These must be installed at all interior tile corner joints engaging compression washer into the tile's kerf. All perimeter wood tile joints, which must bear over a pedestal, must be fastened with #8 x 2½-inch long (63.5 mm) composite deck screws through Bison Wood Tile into the pedestal below. See Figures 14 and 15 (details 1 and 2) for FS-2 fastening kit connection and perimeter screw layout. This installation is for Seismic Design Categories A through C only. Piloting a countersunk hole in Bison Wood Tiles is strongly recommended before driving in #8 x 2½-inch long (63.5 mm) composite deck screws.

4.4.1.2 Concrete Paver Seismic System: S_{DS} = 1.6g at z/h=1.0. Installation of the seismic system with concrete pavers requires the use of the BB-Wedge, at every corner joint intersection of pavers after entire deck is laid. See Figures 16 and 17 for details. At the deck perimeter, the BB-Wedge must be placed in the joint perpendicular to the boundary edge using a BB-Wedge Top or Bottom half. At the deck boundary, a BB-Wedge Top or Bottom half may be placed parallel to perimeter restraint (parapet, curb, etc.) to protect flashing from paver edge.

4.5 Wind Resistance:

The wind design and installation of the Bison Deck Support System with wood tiles, concrete pavers, stone slab pavers or Bison 2CM pavers must be in accordance with this report and the engineering plans, dated January 9, 2025 and July 20, 2021, accompanying this report, as referenced in Tables 3 and 4.

5.0 CONDITIONS OF USE:

The Bison Deck Supports System described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Installation must comply with this report, the manufacturer's published installation instructions, the engineering plans, dated January 9, 2025 and July 20, 2021, as referenced in Tables 3 and 4, and the applicable code. When the manufacturer's published installation instructions differ from this report and the engineering plans, the more restrictive requirement governs.

5.2 The ability of the roof structure/assembly or exterior supporting structure to resist the applicable loads imposed by the raised-deck (elevated flooring) system must be determined by a registered design professional to the satisfaction of the building official.

5.3 The ability of the roof structure/assembly or exterior supporting structure to provide adequate drainage after installation of the raised-deck system must be determined by the registered design professional to the satisfaction of the code official.

5.4 Perimeter containment must be installed around the perimeter of the raised-deck system and at all ramps and/or walkway areas as determined by a registered design professional. The perimeter containment must comply with requirements in the report, must be designed by a registered design professional, and subjected to approval by the code official.

5.5 In accordance with the engineering plans, dated January 9, 2024 and July 20, 2021 as referenced in Tables 3 and 4 for wind resistance, acceptable design wind speeds and design wind pressures of the raised-deck system derived from testing and subsequent data analysis shall not exceed the allowable wind uplift pressure of the existing roof assembly.

5.6 Recognition of raised-deck (elevated flooring) systems installed in structures assigned to Seismic Design Categories A through F is permitted having maximum SDS values when installed in accordance with Section 4.4.

5.7 The Bison Deck Supports System is under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Raised-deck Systems Installed over Roof Assemblies or Exterior Supporting Structures (AC423), dated June 2018 (editorially revised November 2024).

6.2 Engineering analysis for wind and seismic resistance.

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-2884) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

7.2 In addition, a label bearing the address of the manufacturer (Bison Innovative Products), the product name, and production date code is affixed to each pallet.

7.3 The report holder's contact information is the following:

UNITED CONSTRUCTION PRODUCTS dba
BISON INNOVATIVE PRODUCTS
701 OSAGE STREET, UNIT 120
DENVER, COLORADO 80204
(303) 892-0400
www.bisonip.com

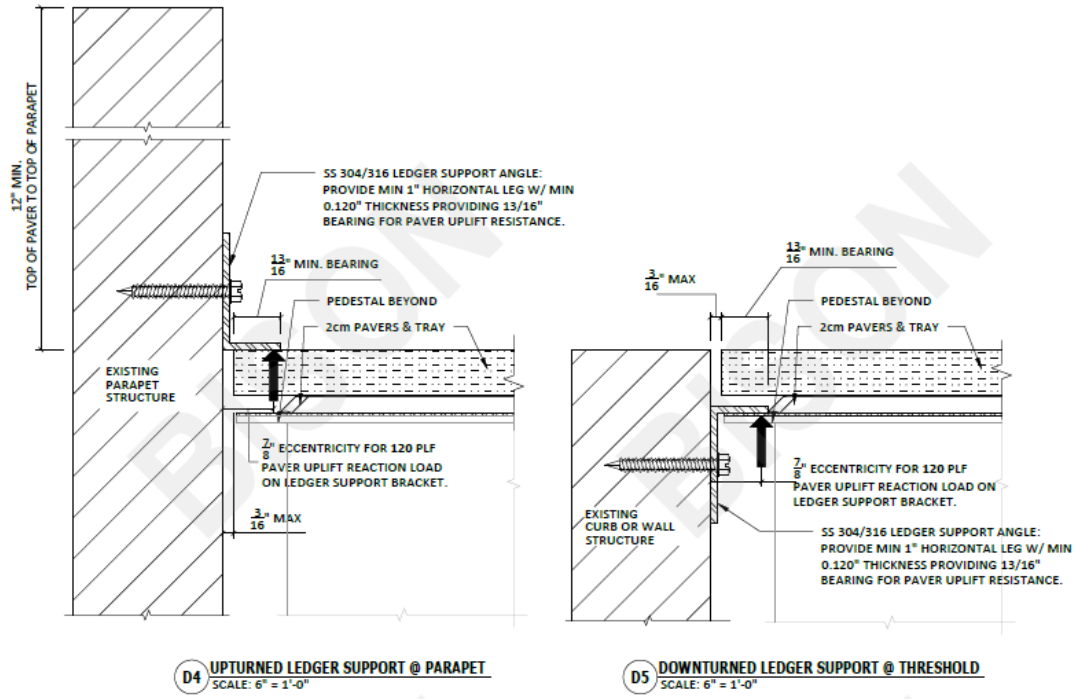


FIGURE 1 – LEDGER SUPPORT DETAILS FOR BISON 2CM PAVERS AND TRAYS (SIMILAR FOR CONCRETE / STONE SLAB PAVERS)

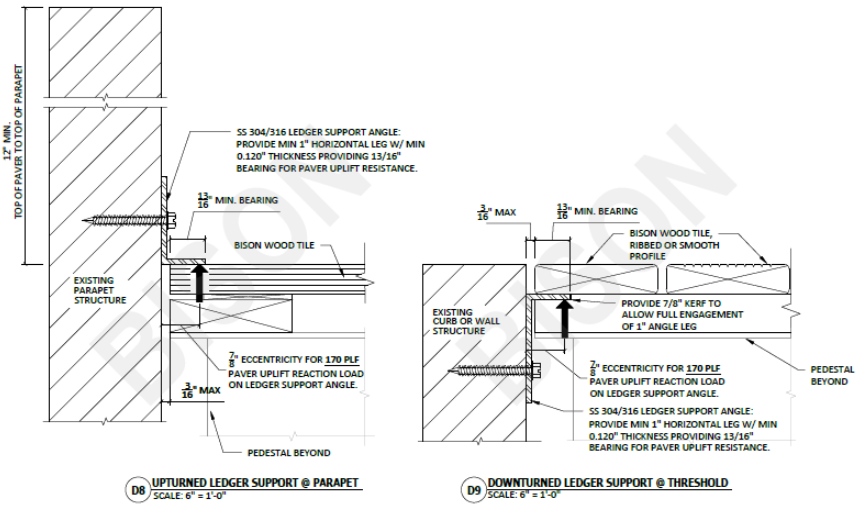


FIGURE 2 – LEDGER SUPPORT DETAILS FOR BISON WOOD TILES

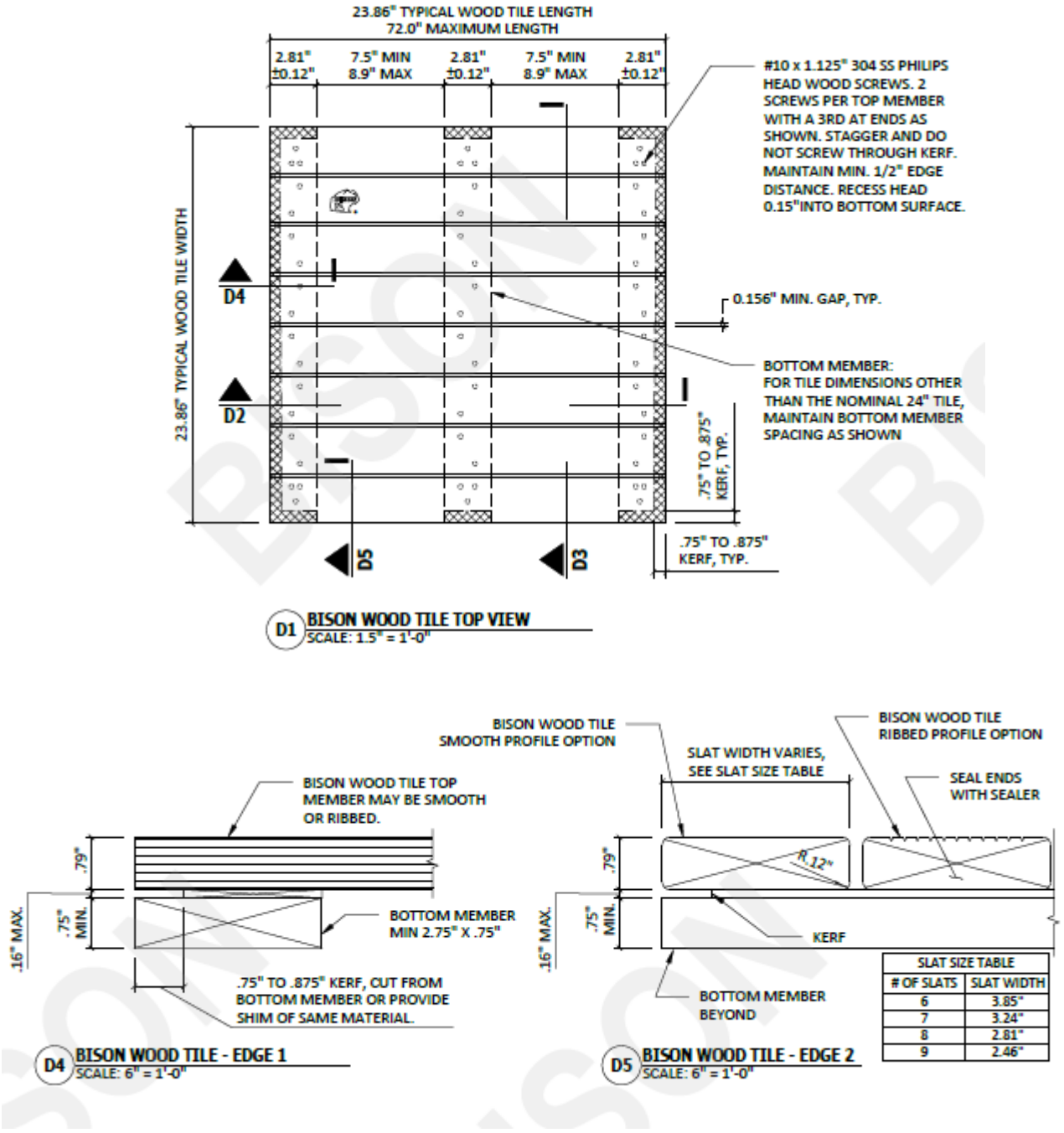


FIGURE 3 – BISON WOOD TILE DETAILS (Example)

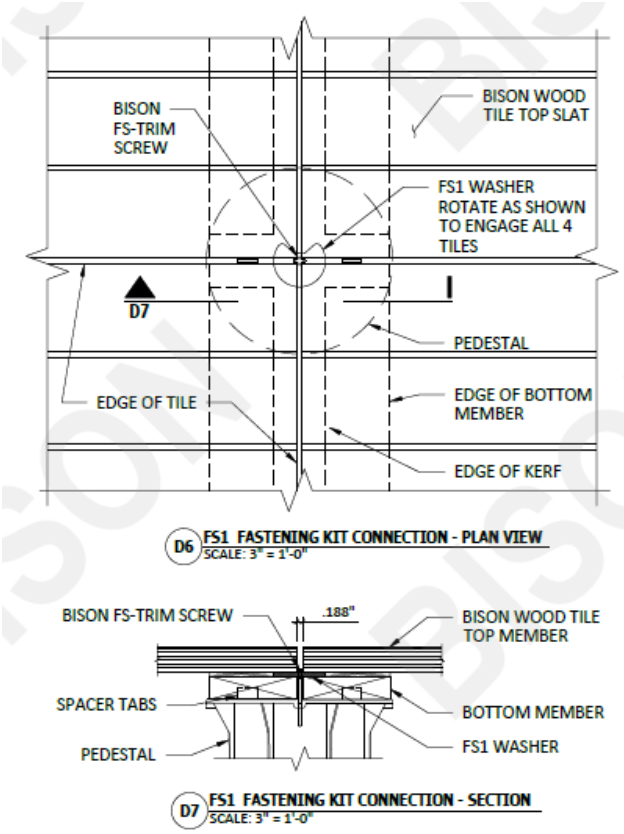


FIGURE 4 – BISON WOOD TILE / FS-1 DETAILS

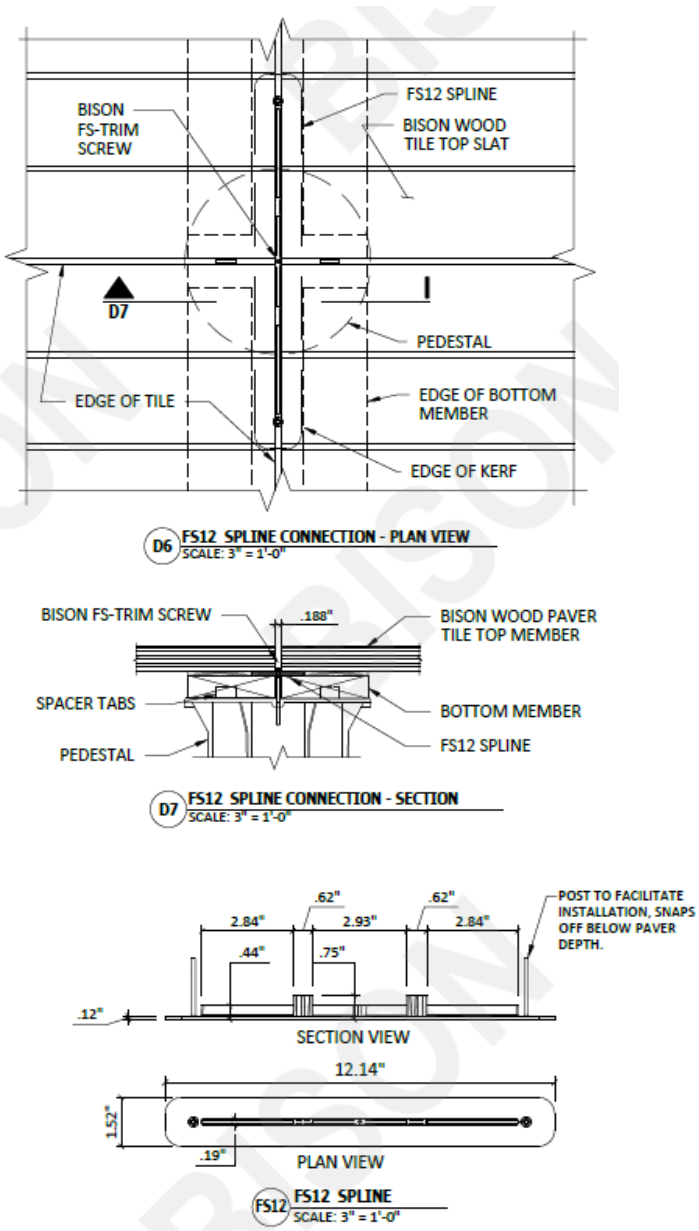
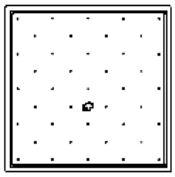
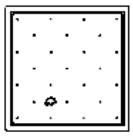
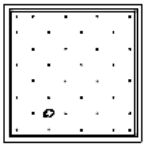
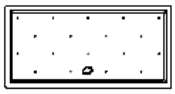
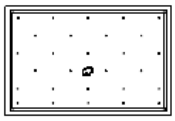
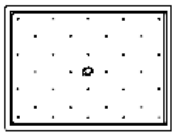


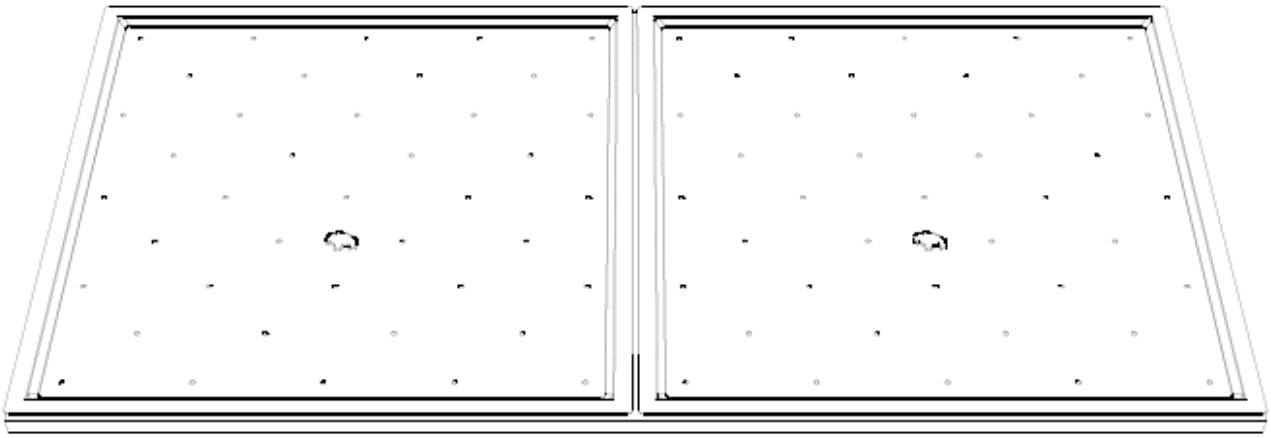
FIGURE 5 – BISON WOOD TILE / FS-12 DETAILS

PT-TRAY	MODEL NAME	DIMENSIONS	FITS 2CM PAVER SIZES	WEIGHT w/ ADHESIVE*
	PT-TRAY-2424-4	23.43" x 23.43" x 0.35" (595 x 595 x 9mm)	595 - 603mm x 595 - 603mm	6.02 lbs (2.73 kg)
	PT-TRAY-1818-4	17.52" x 17.52" x 0.35" (445 x 445 x 9mm)	445 - 453mm x 445 - 453mm	3.38 lbs (1.53 kg)
	PT-TRAY-2020-4	19.49" x 19.49" x 0.35" (495 x 495 x 9mm)	495 - 503mm x 495 - 503mm	4.18 lbs (1.90 kg)
	PT-TRAY-2412-4	23.43" x 11.61" x 0.35" (595 x 295 x 9mm)	595 - 603mm x 295 - 303mm	3.01 lbs (1.36 kg)
	PT-TRAY-2416-4	23.43" x 15.55" x 0.35" (595 x 395 x 9mm)	595 - 603mm x 395 - 403mm	4.00 lbs (1.81 kg)
	PT-TRAY-2418-4	23.43" x 17.52" x 0.35" (595 x 445 x 9mm)	595 - 603mm x 445 - 453mm	4.51 lbs (2.05 kg)

* THESE FIGURES REPRESENT A MAXIMUM WEIGHT, BASED ON THE RECOMMENDED 1/8" DIA. BEAD OF ADHESIVE.

FIGURE 6 – BISON PAVER TRAYS STANDARD SIZES - TYPICAL

BISON PAVER TRAYS CAN BE USED IN COMBINATION TO ACCOMMODATE LARGER FORMAT 2CM PAVERS. WHEN USING MULTIPLE TRAYS BELOW A PAVER, PRE-INSTALLATION ASSEMBLY IS RECOMMENDED. DURING INSTALLATION, IN ORDER TO MAINTAIN ADEQUATE SUPPORT IN CASE OF BREAKAGE, A PEDESTAL MUST BE PLACED AT EACH CORNER OF EVERY TRAY. MANY COMBINATIONS ARE POSSIBLE. THE CHART BELOW PROVIDES INFORMATION FOR THE MOST COMMON PAVER TRAY COMBINATIONS. REFER DETAIL V-105 FOR PT-TRAY COMBINATION ASSEMBLY.



2CM PAVER SIZE*	PT-TRAY COMBINATIONS	FITS PAVER SIZES (mm)	TRAY WEIGHT w/ ADHESIVE**
36" x 18"	(2x) PT-TRAY-1818-4	890-906mm x 445-453mm	6.76 lbs (3.07 kg)
36" x 24"	(2x) PT-TRAY-2418-4	890-906mm x 595-603mm	9.03 lbs (4.09 kg)
36" x 36"	(4x) PT-TRAY-1818-4	890-906mm x 890-906mm	13.53 lbs (6.13 kg)
40" x 20"	(2x) PT-TRAY-2020-4	990-1006mm x 495-503mm	8.36 lbs (3.79 kg)
48" x 12"	(2x) PT-TRAY-2412-4	1190-1206mm x 295-303mm	6.01 lbs (2.73 kg)
48" x 16"	(2x) PT-TRAY-2416-4	1190-1206mm x 395-403mm	8.00 lbs (3.63 kg)
48" x 18"	(2x) PT-TRAY-2418-4	1190-1206mm x 445-453mm	9.03 lbs (4.09 kg)
48" x 24"	(2x) PT-TRAY-2424-4	1190-1206mm x 595-603mm	12.04 lbs (5.46 kg)
48" x 48"	(4x) PT-TRAY-2424-4	1190-1206mm x 1190-1206mm	24.09 lbs (10.92 kg)

* PAVER SIZING IS NOMINAL

** THESE FIGURES REPRESENT A MAXIMUM PT-TRAY COMBINATION WEIGHT, BASED ON THE RECOMMENDED 1/8" DIA. BEAD OF ADHESIVE.

FIGURE 7 – BISON PAVER TRAYS - COMBINATIONS

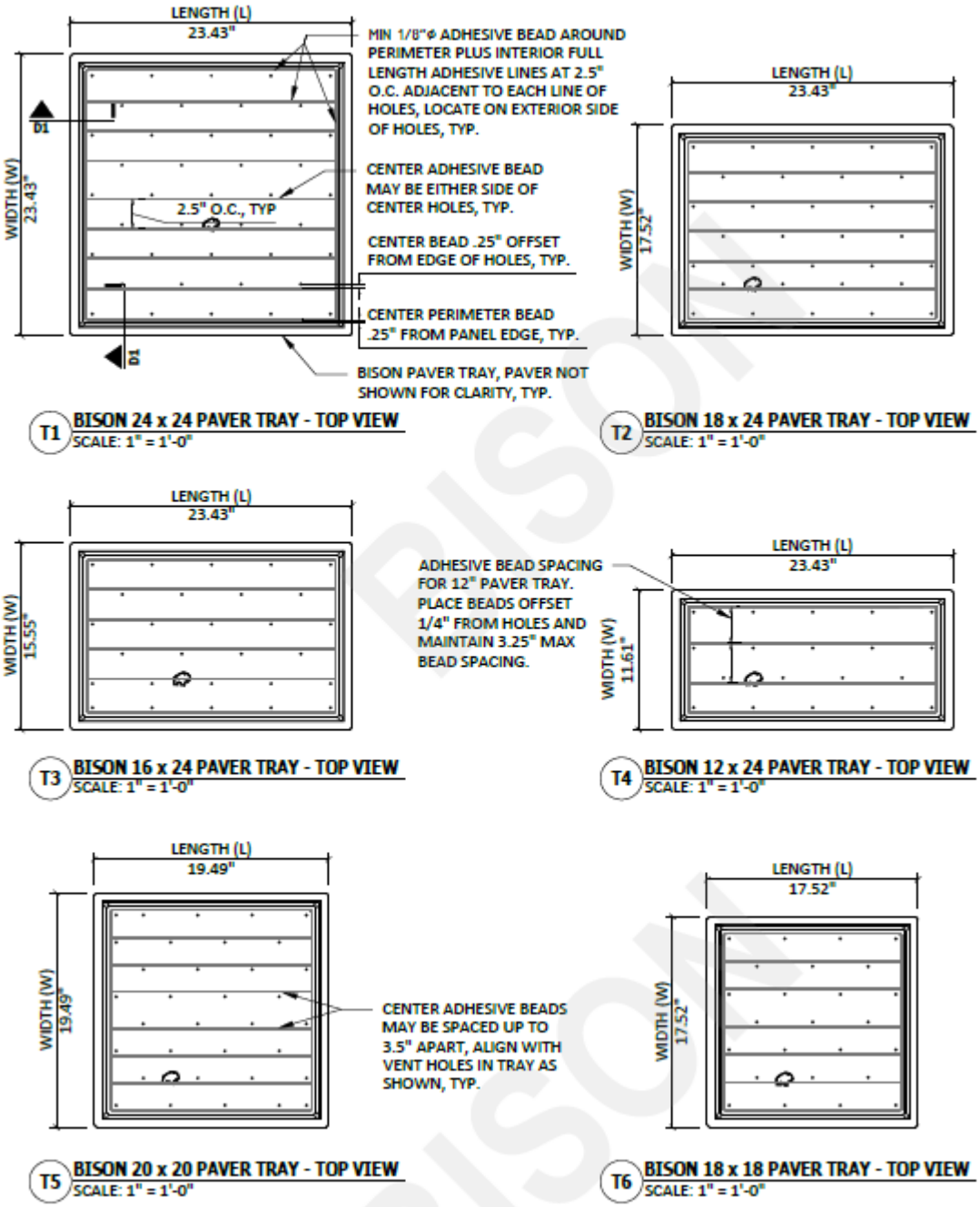
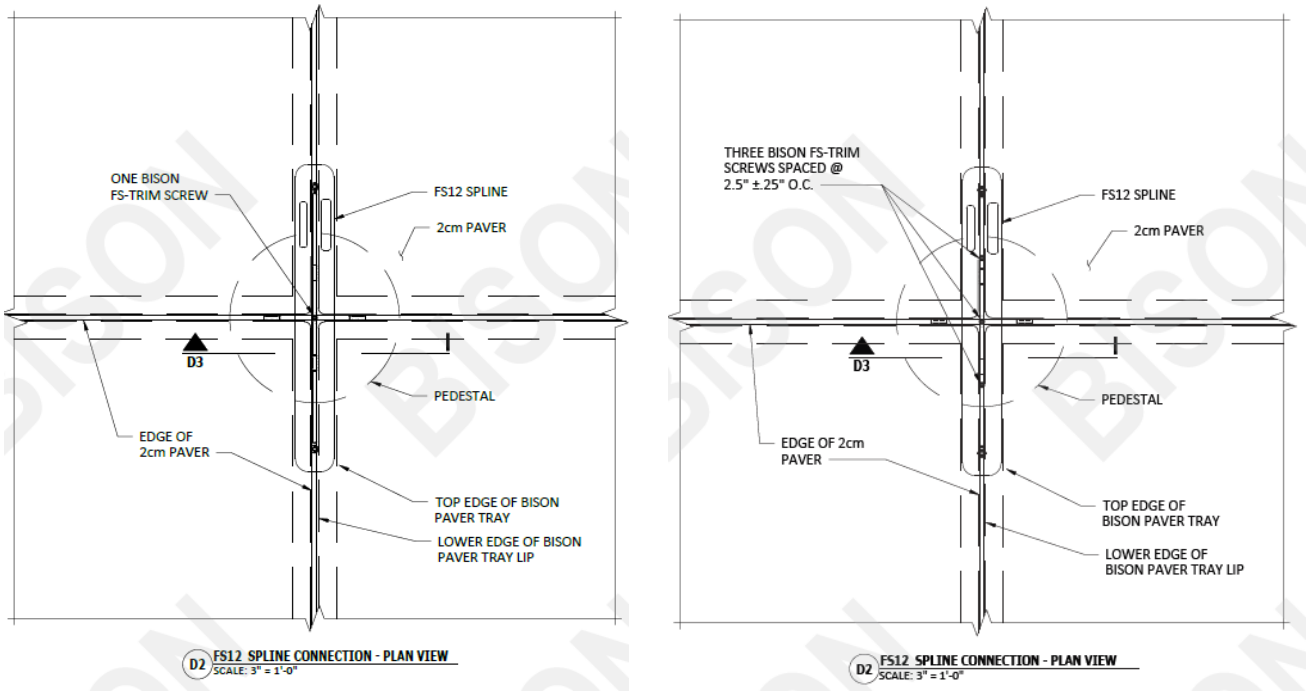


FIGURE 8 – BISON PAVER TRAYS ADHESIVE PATTERNS



***NOTE: SOME FS-12 CONNECTIONS MAY REQUIRE x3 SCREWS VS. TYP. x1 SCREW. SEE DETAIL D2 IN BISON 2CM PAVER AND PAVER WIND TRAY SYSTEMS (TABLE 4).**

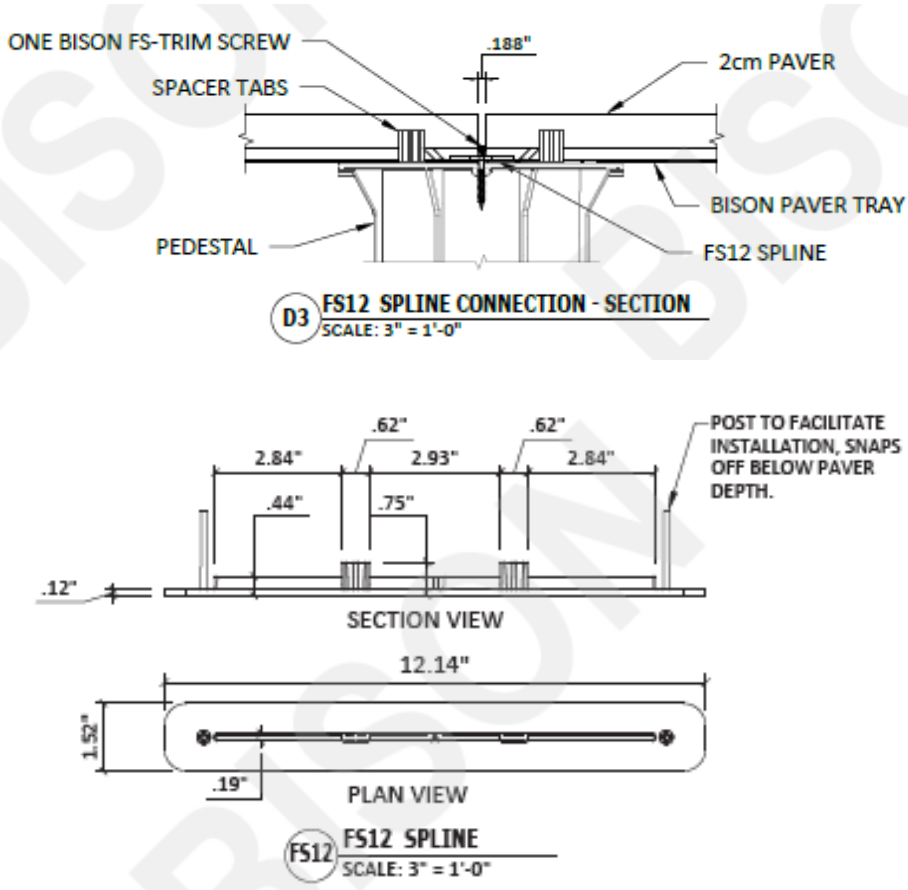


FIGURE 9A – FS-12 SPLINE CONNECTION DETAIL FOR BISON 2CM PAVERS (SIMILAR TO CONCRETE / STONE SLAB PAVERS)

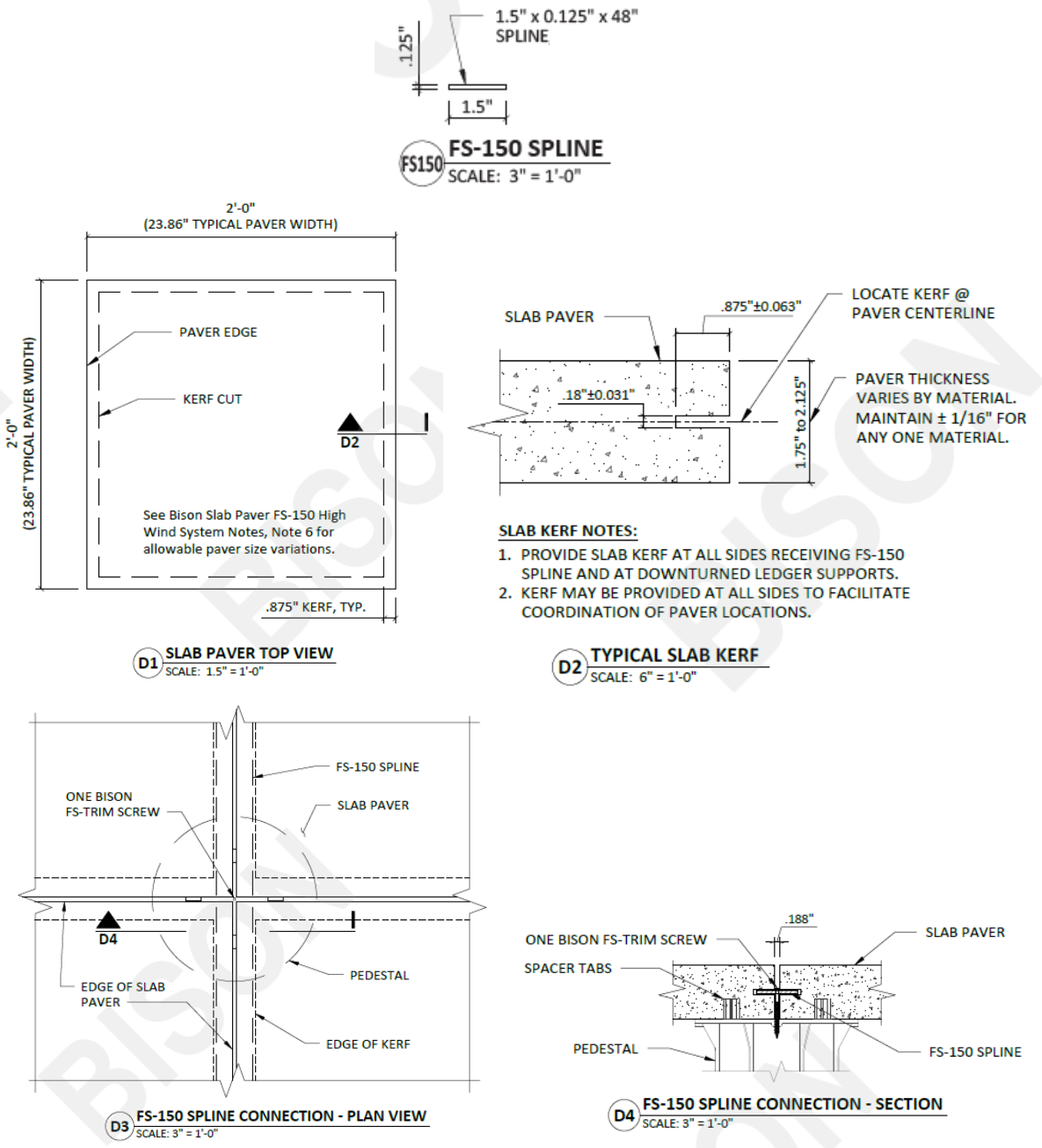


FIGURE 9B – FS-150 SPLINE CONNECTION DETAIL FOR BISON CONCRETE / STONE SLAB PAVERS ONLY

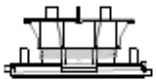
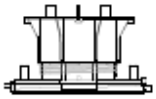
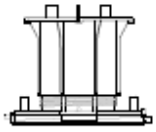
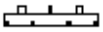
PRODUCT LINE	MODEL NO.	DESCRIPTION	HEIGHT RANGE
	V1-18 V1-316	ADJUSTABLE PEDESTAL 1/8" (3.2 mm) TAB ADJUSTABLE PEDESTAL 3/16" (4.5 mm) TAB	2-1/4" TO 2-3/4" (57 TO 70 mm)
	V2-18 V2-316	ADJUSTABLE PEDESTAL 1/8" (3.2 mm) TAB ADJUSTABLE PEDESTAL 3/16" (4.5 mm) TAB	2-3/4" TO 3-3/4" (70 TO 95 mm)
	V3-18 V3-316	ADJUSTABLE PEDESTAL 1/8" (3.2 mm) TAB ADJUSTABLE PEDESTAL 3/16" (4.5 mm) TAB	3-3/4" TO 5-3/4" (95 TO 146 mm)
	V4-18 V4-316	ADJUSTABLE PEDESTAL 1/8" (3.2 mm) TAB ADJUSTABLE PEDESTAL 3/16" (4.5 mm) TAB	5-3/4" TO 9" (146 TO 229 mm)
	VC2	QUICK CLIP COUPLER FOR USE WITH MODEL V4 ONLY	ADDS UP TO 4" (102 mm) EACH
	VT18 VT316	ULTRA LOW HEIGHT 1/8" (3.2 mm) TAB ULTRA LOW HEIGHT 3/16" (4.5 mm) TAB	1/8" (3.2 mm)
	HD25-18 HD25-316	FIXED HEIGHT STACKABLE 1/8" (3.2 mm) TAB FIXED HEIGHT STACKABLE 3/16" (4.5 mm) TAB	1/4" (6 mm)
	HD50-18 HD50-316	FIXED HEIGHT STACKABLE 1/8" (3.2 mm) TAB FIXED HEIGHT STACKABLE 3/16" (4.5 mm) TAB	1/2" (13 mm)
	HD75-18 HD75-316	FIXED HEIGHT STACKABLE 1/8" (3.2 mm) TAB FIXED HEIGHT STACKABLE 3/16" (4.5 mm) TAB	3/4" (19 mm)
	LO-18 LO-316	LOW HEIGHT ADJUSTABLE 1/8" (3.2 mm) TAB LOW HEIGHT ADJUSTABLE 3/16" (4.5 mm) TAB	1-1/4" TO 2" (32 TO 51 mm)
	LD4	BASE LEVELER FOR 1/4" PER FOOT (2%) SLOPE COMPENSATION	ADDS 1/4" (6 mm)

FIGURE 10 – VERSADJUST PEDESTALS AND COMPONENTS

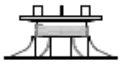
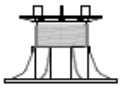
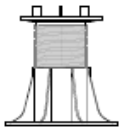
SCREWJACK / ACCESSORIES	MODEL NUMBER	RANGE OF ADJUSTMENT	ADDS	DESCRIPTION
	VT316	1/8" FIXED (3mm)	-	ULTRA LOW FIXED HEIGHT
	HD25-316	1/4" FIXED (6mm)	-	FIXED HEIGHT STACKABLE PEDESTAL
	HD50-316	1/2" FIXED (13mm)	-	FIXED HEIGHT STACKABLE PEDESTAL
	HD75-316	3/4" FIXED (19mm)	-	FIXED HEIGHT STACKABLE PEDESTAL
	B1	1 1/4" - 2" (32mm - 51mm)	-	ADJUSTABLE PEDESTAL
	B2	2" - 3" (51mm - 76mm)	-	ADJUSTABLE PEDESTAL
	B3	3" - 4 3/4" (76mm - 121mm)	-	ADJUSTABLE PEDESTAL
	B4	4 3/4" - 7 3/4" (121mm -197mm)	-	ADJUSTABLE PEDESTAL
	C4	0" - 4" (0mm - 102mm)	ADDS UP TO 4" (102mm)	COUPLER

FIGURE 11 –SCREWJACK PEDESTALS AND COMPONENTS

PRODUCT LINE	MODEL NO.	DESCRIPTION	HEIGHT RANGE
	LC-18 LC-316	ADJUSTABLE PEDESTAL 1/8" (3.2 mm) TAB ADJUSTABLE PEDESTAL 3/16" (4.5 mm) TAB	2" TO 4-3/4" (51 TO 121 mm)
	C1	COUPLER	ADDS UP TO 1-1/2" (38 mm)
	C4	COUPLER	ADDS UP TO 4" (102 mm)
	VT18 VT316	ULTRA LOW HEIGHT 1/8" (3.2 mm) TAB ULTRA LOW HEIGHT 3/16" (4.5 mm) TAB	1/8" (3.2 mm)
	HD25-18 HD25-316	FIXED HEIGHT STACKABLE 1/8" (3.2 mm) TAB FIXED HEIGHT STACKABLE 3/16" (4.5 mm) TAB	1/4" (6 mm)
	HD50-18 HD50-316	FIXED HEIGHT STACKABLE 1/8" (3.2 mm) TAB FIXED HEIGHT STACKABLE 3/16" (4.5 mm) TAB	1/2" (13 mm)
	HD75-18 HD75-316	FIXED HEIGHT STACKABLE 1/8" (3.2 mm) TAB FIXED HEIGHT STACKABLE 3/16" (4.5 mm) TAB	3/4" (19 mm)
	LO-18 LO-316	LOW HEIGHT ADJUSTABLE 1/8" (3.2 mm) TAB LOW HEIGHT ADJUSTABLE 3/16" (4.5 mm) TAB	1-1/4" TO 2" (32 TO 51 mm)
	LD4	BASE LEVELER FOR 1/4" PER FOOT (2%) SLOPE COMPENSATION	ADDS 1/4" (6 mm)

FIGURE 12 –LEVEL.IT PEDESTALS AND COMPONENTS

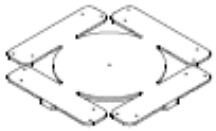
PRODUCT LINE	MODEL NO.	DESCRIPTION	HEIGHT RANGE
	B11	FLEXIBLE SHIM	1/16" (1.5 mm)
	PS1	RIGID SHIM	1/8" (3.2 mm)
	FS-1	WOOD TILE FASTENING KIT INCLUDES 2 SCREWS	--
	FS-12 FS-12-WT	12" (305 mm) FASTENING SPLINE 3/16" (4.5 mm) TAB, INCLUDES 2 SCREWS	--
	BB-WEDGE	SPACING WEDGE INCLUDES 2 WEDGE PIECES AND 1 SCREW	--
	JT	JOIST TOP ATTACHMENT INCLUDES 1 SCREW	ADDS 3/16" (4.5 mm)
	FFB	FLOATING FOUNDATION BASE FOR USE OVER SOIL	12" x 12" x 1/4" (305 x 305 x 6 mm)
	FIB	FLOATING INSULATION BASE FOR USE OVER SYSTEMS WITH 20 TO 40 psi INSULATION	12" x 12" x 11/16" (305 x 305 x 17 mm)
	BB-BRACE	BRACE KIT INCLUDES 2 BRACE PIECES AND BB-LATCH FASTENERS	FITS 11-3/4" TO 36" PAVERS (299 TO 914 mm)
	BB-C	BRACE COLLAR FITS MODEL V4 WITH VC2(s)	--
	BB-FH	FIXED HEIGHT BRACE KIT INCLUDES 2 BRACE PIECES AND BB-SCREW FASTENERS	FITS 8-1/2" TO 25-1/2" PAVERS (216 TO 647 mm)
	BB-CONNECT	FIXED HEIGHT BRACE CONNECTOR CONNECTS BB-FH TO ADJUSTABLE PEDESTALS	--
	BB-PEG	BRACE PEG FITS MODELS LO AND V1 TO V4	--
	LD4	BASE LEVELER FOR 1/4" PER FOOT (2%) SLOPE COMPENSATION	ADDS 1/4" (6 mm)

FIGURE 13 –ACCESSORIES AND COMPONENTS

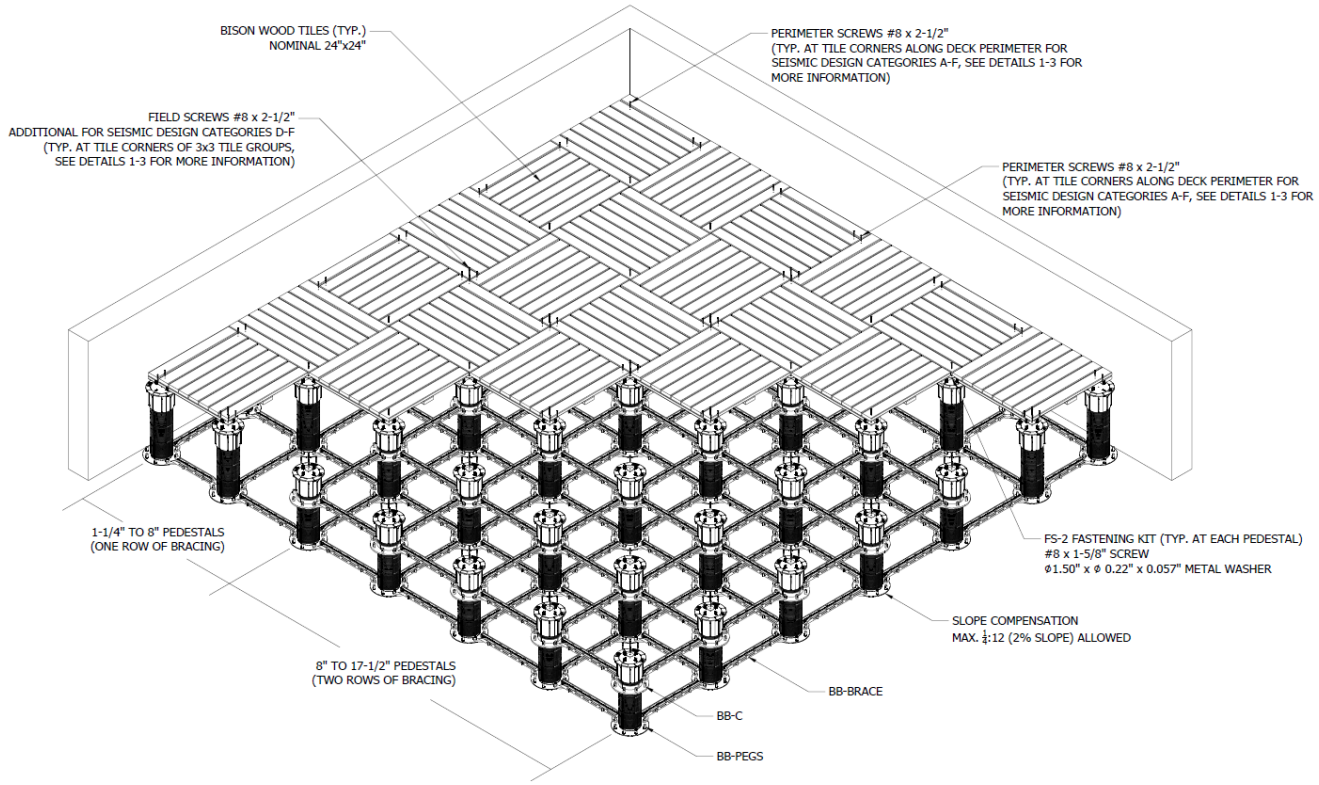


FIGURE 14 – BISON WOOD TILE SEISMIC SYSTEMS

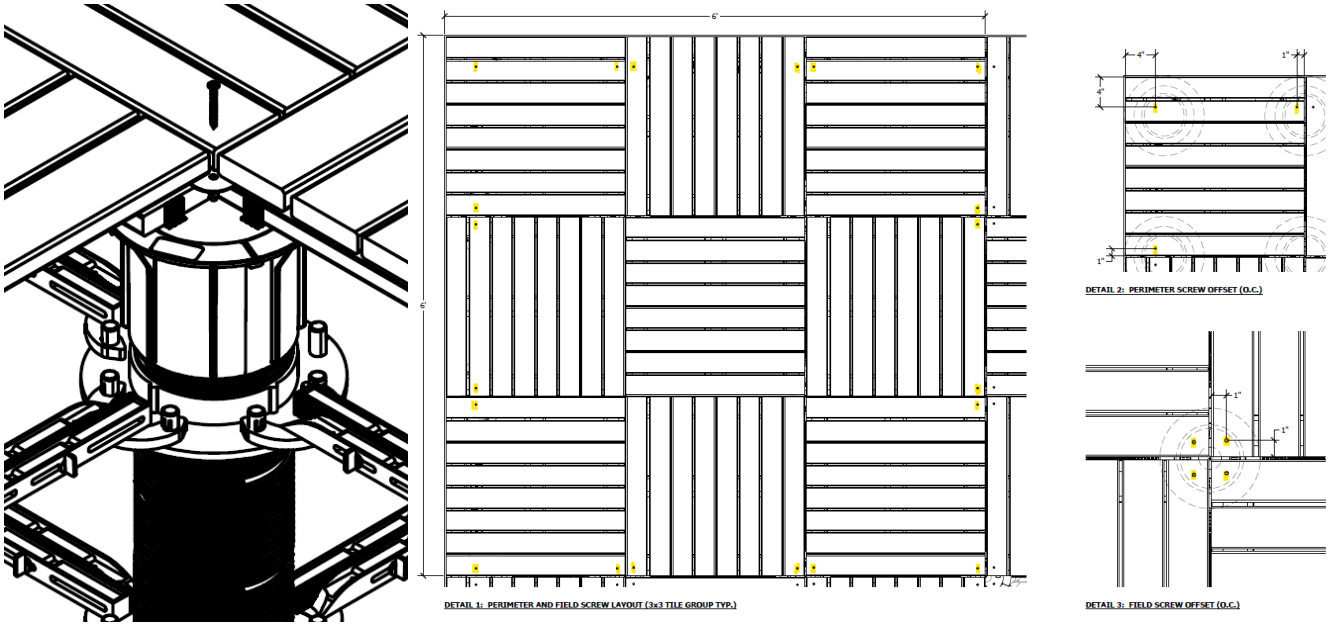


FIGURE 15 – BISON WOOD TILE SEISMIC SYSTEM: FS-2 (LEFT) & PERIMETER AND FIELD SCREW DETAILS

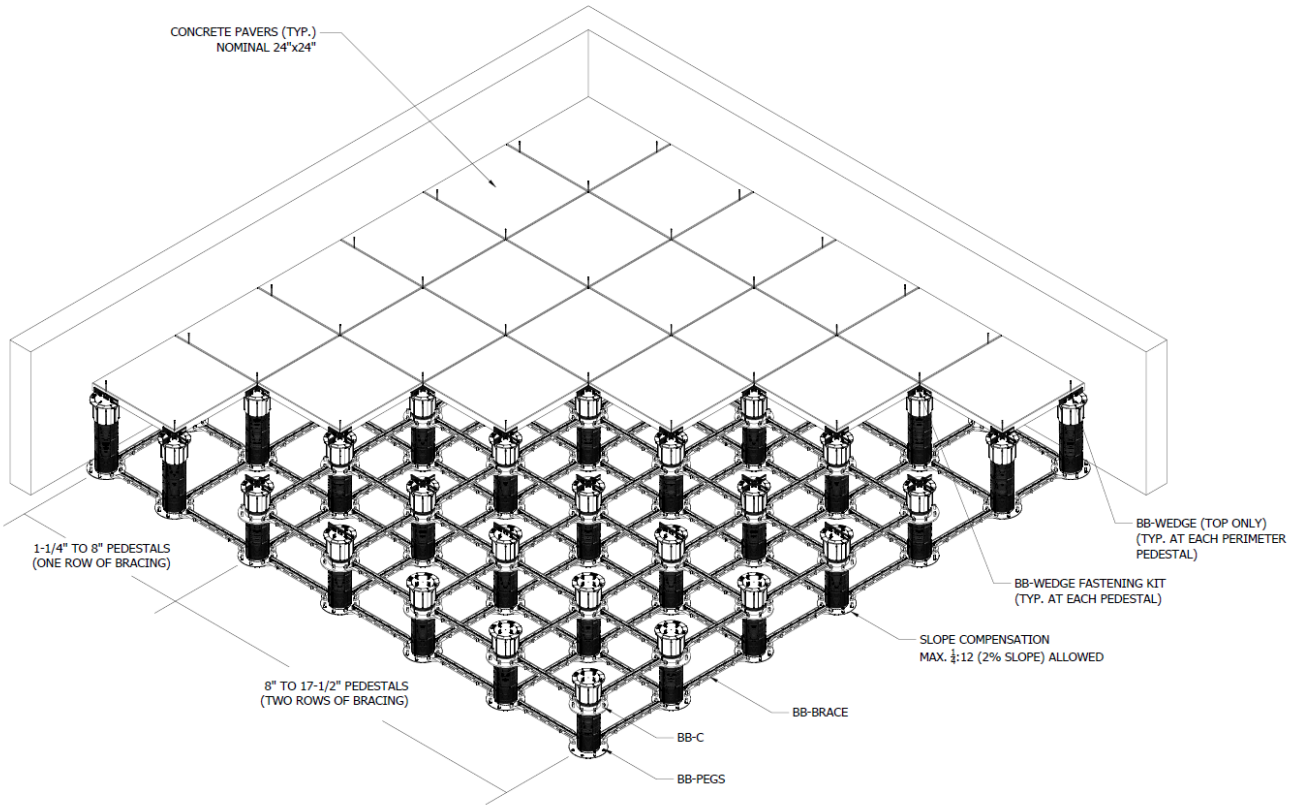


FIGURE 16 – CONCRETE PAVER SEISMIC SYSTEM

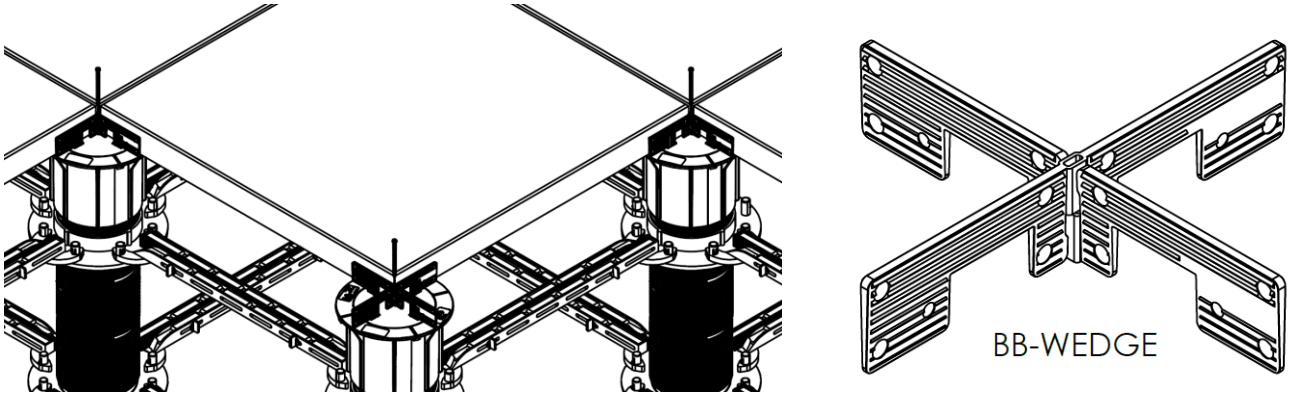


FIGURE 17 – CONCRETE PAVER SEISMIC SYSTEM BB-WEDGE DETAIL

TABLE 1 – DESIGN LOADS AT MAXIMUM NOMINAL 24 INCHES O.C. PEDESTAL SPACING (PSF)[2]

DECK SUPPORT SYSTEM	LOAD AT L/360 DEFLECTION	MAXIMUM ULTIMATE LOAD[1]
BISON WOOD TILES	135	1575
MINIMUM 2 INCH THICK CONCRETE/STONE PAVER	200	1110
MINIMUM 1 ¾ INCH THICK CONCRETE/STONE SLAB ADHERED TO BISON PAVER TRAY	200	1,110
BISON 2CM PAVERS ADHERED TO BISON PAVER TRAY	145	1,020

For **SI**: 1 inch = 25.4 mm, 1 psf = 4.88 kg/m^2

[1]A minimum factor of safety of 3 shall be applied to the tabulated maximum ultimate load as determinted by a registered design professional. See IBC Section 1605 with regard to design load combinations.
[2]For heights between 2 ft and 3 ft, Bison Lateral Bracing must be installed per recommended manufacturer's installation instructions.

TABLE 2A - ALLOWABLE PEDESTAL AXIAL COMPRESSIVE LOAD CAPACITY (LBF)[1,2,3,4]

PEDESTAL SYSTEM	AXIAL LOAD AT 1 ft HEIGHT	AXIAL LOAD AT 2 ft HEIGHT	AXIAL LOAD AT 3 ft HEIGHT
VERSADJUST (B-PP-2025)	1250	1250	1250
SCREWJACK (B-PP-2025)	1000	1000	1000
LEVEL.IT (B-PP-2025)	1000	1000	N/A

For **SI**: 1 ft = 304.8 mm, 1 lbf = 0.45 kg

[1]Allowable Pedestal Axial Compressive Loads reported in this table are determined using a factor of safety of 3 applied to the ultimate load.
[2]For heights between 2 ft and 3 ft, Bison Lateral Bracing must be installed per recommended manufacturer's installation instructions.
[3]The axial compressive load capacity reported in Table 2A of this report shall not be exceeded.
[4]N/A = Not available.

TABLE 2B – ALLOWABLE PEDESTAL AXIAL COMPRESSIVE LOAD CAPACITY (LBF)[1,2,3,4]

PEDESTAL SYSTEM	AXIAL LOAD AT 1 ft HEIGHT	AXIAL LOAD AT 2 ft HEIGHT	AXIAL LOAD AT 3 ft HEIGHT
VERSADJUST (B-PP-FR)	1250	1250	1250
SCREWJACK (B-PP-FR)	850	850	850
LEVEL.IT (B-PP-FR)	850	850	N/A

For **SI**: 1 ft = 304.8 mm, 1 lbf = 0.45 kg

TABLE 3 - WIND RESISTANCE DESIGN FOR BISON SUPPORT DECKING SYSTEMS: ENGINEERING PLANS DATED JANUARY 9, 2025

DRAWINGS	DATED	PAGES	SECTION DESCRIPTION
KC25-0107	January 9, 2025	1 thru 6	BISON PAVER TRAY / 2CM PAVER SYSTEM
KC25-0108	January 9, 2025	1 thru 8	BISON PAVER TRAY / 2CM PAVER WIND SYSTEM
KC25-0109	January 9, 2025	1 thru 6	BISON PAVER TRAY / 2CM PAVER HIGH WIND SYSTEM
KC25-0110	January 9, 2025	1 thru 6	BISON HIGH-DENSITY WOOD TILE FS-1 WIND SYSTEM
KC25-0111	January 9, 2025	1 thru 6	BISON HIGH-DENSITY WOOD TILE FS-1 HIGH WIND SYSTEM
KC25-0112	January 9, 2025	1 thru 6	BISON HIGH-DENSITY WOOD TILE FS-12 WIND SYSTEM
KC25-0113	January 9, 2025	1 thru 6	BISON HIGH-DENSITY WOOD TILE FS-12 HIGH WIND SYSTEM
KC25-0114	January 9, 2025	1 thru 6	BISON MID-DENSITY WOOD TILE FS-12 WIND SYSTEM
KC25-0115	January 9, 2025	1 thru 6	BISON PAVER TRAY / SLAB PAVER SYSTEM
KC25-0116	January 9, 2025	1 thru 6	BISON PAVER TRAY / SLAB PAVER WIND SYSTEM
KC25-0117	January 9, 2025	1 thru 6	BISON SLAB PAVER FS-150 HIGH WIND SYSTEM

TABLE 4 - WIND RESISTANCE DESIGN FOR BISON SUPPORT DECKING SYSTEMS: ENGINEERING PLANS DATED JULY 20, 2021

DRAWINGS	DATED	PAGES	SECTION DESCRIPTION
KC20-0520 R2	July 20, 2021, No. 2	1 thru 6	BISON PAVER TRAY / 2CM PAVER SYSTEM
KC20-0521 R3	July 20, 2021, No. 3	1 thru 8	BISON PAVER TRAY / 2CM PAVER WIND SYSTEM
KC20-0522 R2	July 20, 2021, No. 2	1 thru 6	BISON PAVER TRAY / 2CM PAVER HIGH WIND SYSTEM
KC20-0525 R1	July 20, 2021, No. 1	1 thru 6	BISON WOOD TILE FS1 WIND SYSTEM
KC20-0526 R0	April 12, 2021	1 thru 6	BISON WOOD TILE FS1 HIGH WIND SYSTEM
KC20-0527 R1	July 20, 2021, No. 1	1 thru 6	BISON WOOD TILE FS12 WIND SYSTEM
KC20-0528 R2	July 20, 2021, No. 2	1 thru 6	BISON WOOD TILE FS12 HIGH WIND SYSTEM
KC21-0713 R0	July 20, 2021	1 thru 6	BISON PAVER TRAY / SLAB PAVER SYSTEM
KC21-0714 R0	July 20, 2021	1 thru 6	BISON PAVER TRAY / SLAB PAVER WIND SYSTEM

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 52 00—Plastic Structural Assemblies

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 76 00—Roof Pavers

REPORT HOLDER:

UNITED CONSTRUCTION PRODUCTS dba BISON INNOVATIVE PRODUCTS

EVALUATION SUBJECT:

BISON DECK SUPPORTS SYSTEMS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Bison Deck Supports Systems, described in ICC-ES evaluation report ESR-2884, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2020 *City of Los Angeles Building Code* (LABC)

2.0 CONCLUSIONS

The Bison Deck Supports Systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-2884, comply with the LABC Chapters 15 and 26, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Bison Deck Supports Systems described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-2884.
- The design, installation, conditions of use and identification of the Bison Deck Supports Systems are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report ESR-2884.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- The adjustable pedestals shall be covered and protected from sun exposure.
- Structural observations shall be provided for the confinement of the boundary construction.

This supplement expires concurrently with the evaluation report, reissued October 2024 and revised February 2025.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 52 00—Plastic Structural assemblies

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 76 00—Roof Pavers

REPORT HOLDER:

UNITED CONSTRUCTION PRODUCTS dba BISON INNOVATIVE PRODUCTS

EVALUATION SUBJECT:

BISON DECK SUPPORTS SYSTEMS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Bison Deck Supports Systems, described in ICC-ES evaluation report ESR-2884P, have also been evaluated for compliance with the code noted below.

Applicable code edition:

- 2019 *California Building Code* (CBC)

For evaluation of applicable Chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

2.0 CONCLUSIONS

2.1 CBC:

The Bison Deck Supports Systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-2884P, comply with CBC Chapters 16 and 26, provided the design and installation are in accordance with the 2021 and 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16 and 26, as applicable.

The products have not been evaluated under Chapter 7A for use in the exterior design and construction of new buildings located in a Fire Hazard Severity Zone within State Responsibility Areas or any Wildland–Urban Interface Fire Area.

2.2 OSHPD:

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.3 DSA:

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

This supplement expires concurrently with the evaluation report, reissued October 2024 and revised February 2025.

ICC-ES Evaluation Report

ESR-2884P FL Supplement

Reissued October 2024
Revised February 2025
This report is subject to renewal October 2026.

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 52 00—Plastic Structural Assemblies

DIVISION: 07 00 00 —THERMAL AND MOISTURE PROTECTION
Section: 07 76 00 — Roof Pavers

REPORT HOLDER:

UNITED CONSTRUCTION PRODUCTS dba BISON INNOVATIVE PRODUCTS

EVALUATION SUBJECT:

BISON DECK SUPPORTS SYSTEMS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Bison Deck Supports Systems, described in ICC-ES evaluation report ESR-2884, has also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 *Florida Building Code—Building*

2.0 CONCLUSIONS

The Bison Deck Supports Systems, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-2884, complies with the *Florida Building Code—Building*. The design requirements must be determined in accordance with the *Florida Building Code—Building*. The installation requirements noted in ICC-ES evaluation report ESR-2884 for the 2018 *International Building Code*® meet the requirements of the *Florida Building Code—Building,* with the following condition:

- Design and installation must meet the requirements of Sections 3115 of the *Florida Building Code—Building.*

Use of the Bison Deck Supports Systems for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* or the *Florida Building Code—Residential* has not been evaluated, and is outside the scope of this supplemental report.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued October 2024 and revised February 2025.