



SECTION 07760 [07 76 16]

DECK PEDESTALS

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pedestal Deck Support System.
- B. Wood Paver Tiles.

1.2 RELATED SECTIONS

- A. Section 02780 - Unit Pavers.
- B. Section 04220 - Concrete Unit Masonry.
- C. Section 04400 - Stone Assemblies.
- D. Section 04410 - Dry-Placed Stone.
- E. Section 06150 - Wood Decking.
- F. Section 06500 - Structural Plastic Decking.
- G. Section 06730 - Composite Decking.
- H. Section 07500 - Membrane Roofing.
- I. Section 07720 - Roof Walkways.
- J. Section 07760 - Roof Pavers.
- K. Section 09690 - Access Flooring.

1.3 REFERENCES

- A. US Green Building Council.

- B. ASTM D 1238 – Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer.
- C. ASTM D 792 – Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement ASTM D 638-03 – Standard Test Method for Tensile Properties of Plastics
- D. ASTM D 638 – Standard Test Method for Tensile Properties of Plastics
- E. ASTM D 256 – Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
- F. ASTM D 648 – Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
- G. Forest Stewardship Council (FSC) - Wood deck tiles that are certified by FSC

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. General:
 1. Provide a complete deck support system as indicated on the Drawings.
 2. Deck supports specified are to be for used with pedestrian traffic only. Decks shall not be exposed to any wheeled motorized or equipment traffic.
 3. Decks must be restrained by perimeter blocking or walls on all sides. Lateral movement greater than one-tab width is unacceptable and will be rejected.
 4. Installation or anticipated installation of additional items on top of the deck, (such as planters, concrete benches, sculptures, hot tubs, grills, or industrial equipment) shall be supported directly by additional pedestals in addition to the main deck paver/tile pedestal system.
 5. Include special consideration when installing equipment that vibrates.
 6. Calculate total weights and dispersed evenly over the number of pedestals needed to carry the expected weight.
 7. To avoid point loading, the use of planters or architectural features with 'feet' is not allowed.
 8. Failure to adequately support the additional weight of any such features or items may cause significant damage to the deck, underlying structure, or waterproofing system.
 9. All decks shall be designed to not exceed the design capacity of the pedestal.
 10. Substrate immediately below the pedestals shall provide positive drainage
- B. Decks over roofing and waterproofing:
 1. Roof systems must meet local building code and be in accordance with the NRCA recommended good construction practices. Only roofing manufacturer approved systems shall be used.
 2. If high density closed cell extruded 60 psi polystyrene insulation is installed on top of the membrane in a protected membrane system, MRP's Eterno Supports may be installed directly on top of this type of insulation.
 3. Do not use MRP's Eterno Supports over any insulation less than 20 psi or with low density polystyrene (bead board) insulation.
- C. Decks on Grade:
 1. Any substrate that is to receive pedestals shall be adequately compacted and have positive drainage slope.
 2. As a minimum provide a walkway compacted gravel base at all pedestal locations.

3. Provide a wall or perimeter containment on all open sides. Install structural perimeter containment that restrains the entire decking system.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation instructions. Include manufacturer's literature completely describing all components of the paver pedestal system with detailed installation recommendations and instructions.
 4. Cleaning and maintenance instructions.
- C. Shop Drawings: Submit shop drawings showing all components required for the paver and pedestal requirements. Include plan drawings showing layout of all paver areas and detail drawings showing how the various components of the system fit together. Show deck materials used, pattern, grid layout, starting point, and finished elevation.
- D. Structural Analysis: Provide confirmation of the structural capability and adequacy of the structure to carry the dead and live load weight(s) required, and that the density of any insulation is satisfactory to resist crushing and damaging the waterproofing membrane.
- E. LEED Submittals: Provide documentation to support requirements of how the following Credit will be met:
 1. Deck Pedestals contain 100 percent Post-Industrial Recycled Material and can contribute to multiple points within Materials and Resources Credits 4 as a single product contributing to multiple LEED points.
 2. Wood Tiles: FSC-Certified (FSC-C13454) Ipê and Massarunduba wood tiles could contribute to LEED points under Materials and Resources Credit 7 (MR Credit 6 for CS).
- F. Verification Samples: For each finish product specified, two samples, representing actual product, color, and patterns.
- G. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- H. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic cleaning, adjustment and maintenance of components.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum of 10 years experience manufacturing deck supports and tile systems.
- B. Installer Qualifications: Installer must have a minimum of 2 years proven construction experience for projects of a similar type and scale. All Work must comply with the manufacturer's installation instructions and procedures for deck support work specified herein.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and installation workmanship.

1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.
4. Accepted mock-ups shall be comparison standard for remaining Work

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's unopened packaging with labels intact and legible. Inspect all delivered materials to insure they are undamaged and in good condition.
- B. Store products under cover in manufacturer's unopened packaging until ready for installation.
- C. Store IPE out of direct sunlight, rain or snow. Kept clean, dry and off the ground prior to installation. A moisture barrier should be placed on the ground under the IPE to prevent Water Cycle inside the packaging while stored on site. Do not dense pack IPE after removal as any surface moisture which might be trapped in the unit may result in de-equalization, potential mold growth and or water stains The likelihood of sticker marks will increase the longer the wood is stored between removal and re-installation. It is reasonable to expect some movement of the wood upon removal as tension which was addressed during initial installation, will be released upon removal. Re-install IPE as per chosen fastener manufactures instructions.
- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 SEQUENCING AND SCHEDULING

- A. Conference: Convene a pre-installation conference to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.10 WARRANTY

- A. Provide the manufacturer's three year limited warranty against manufacturing defects. Provide the installers three year warranty that his work will remain free from defects of labor and materials used in conjunction with his work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Marathon Supports.; 3310 Benzing Rd., Orchard Park, NY 14127-1538. Phone Toll Free: 800-828-8424. Phone: 716-332-7673. Fax: 716-332-7676. Web: www.mrpsupports.com. Email: _____

- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 APPLICATIONS/SCOPE

- A. MRP's Eterno Supports a maximum cavity height of 21.75 inches (550 mm) with additional bracing. Deck supports are not designed for supporting decks that carry vehicular traffic or equipment including but not limited to snow removal equipment, ATV's, forklifts, or any motorized vehicles. Consult the Manufacturer and the Project Engineer regarding the following conditions:
 - 1. When spacer tab condition or design requires spacing between decking tiles or concrete pavers other than the standard spacing required by the manufacturer.
 - 2. When considering use for other than a raised deck (e.g. interior floors, stairs, etc.).
 - 3. When the required pedestal height exceeds the safe limits as determined by the Manufacturer.
 - 4. When pedestal load capacity exceeds the maximum listed.
 - 5. When anticipating installation of any items with excess weight on top of the deck.
 - 6. When using MRP's Eterno Supports on grade (soil).
 - 7. When greater pedestal load capacity is required.

2.3 PEDESTAL DECK SUPPORT SYSTEM

- A. Eterno SE Self-leveling Adjustable Support Deck Pedestals:
 - 1. Material: Mineral Filled High Density Copolymer Polypropylene. Contains 100 percent Post-industrial recycled material.
 - 2. Weight Bearing Design Capacity: 2505 lbs per pedestal.
 - 3. Supporting Base:
 - a. Surface Area: 49.6 square inches (320 sq. cm.).
 - b. Four 1/4 inch (6 mm) diameter holes for drainage and / or mechanical attachment.
 - 4. Self-Leveling Head: 5/32 inch (4 mm) thick plate and compensates gradients of up to 5 percent
 - 5. Model / Adjustable Height Range:
 - a. Model Star T: 3/8 inches to 9/16 inches (10-15mm)
 - b. Model Start B: 3/16 (5mm) extension for the Star T (Maximum qty 3 allowed)
 - c.
 - d. Model SE0: 1.125 inches to 1-1/2 inches (28 mm – 38 mm).
 - e. Model SE1: 1-1/2" inches to 2 inches (37.5 mm – 50 mm)
 - f. Model SE2: 2 inches to 3 inches (50 mm – 75 mm).
 - g. Model SE3: 3 inches to 4-3/4 inches (75 mm – 120 mm).
 - h. Model SE4: 4-3/4 inches to 6-3/4 inches (120 mm – 170 mm).
 - i. Model SE5: 6-3/4 inches to 8-1/2 inches (170 mm – 215 mm).
 - j. Model SE6: 5-1/2 inches to 9 inches (140 mm – 230 mm).
 - k. Model SE7: 7-1/4 inches to 10-3/4 inches (185 mm – 275 mm).
 - l. Model SE8: 9-1/4 inches to 12-3/4 inches (235 mm – 325 mm).
 - m. Model SE9: 8 inches to 13-1/2 inches (205 mm – 345 mm).
 - n. Model SE10: 9.875 inches to 15 inches (250 mm – 385 mm).
 - o. Model SE11: 11-3/4 inches to 15-3/4 inches (300 mm – 400 mm).
 - p. Model SE12: 10-1/2 inches to 18 inches (270 mm – 455 mm).

- q. Model SE13: 12.4 inches to 19-3/4 inches (315 mm – 500 mm).
- r. Model SE14: 14-1/4 inches to 21-3/4 inches (365 mm – 550 mm).
- 6. Alternative Head options:
 - a. Wood Joist Head
 - b. Locking Piece for Fixed Head
 - c. Pins for IPE Wood Paver Applications
- B. Eterno NM Adjustable Supports with Fixed Head
 - 1. Material: Mineral Filled High Density Copolymer Polypropylene. Contains 100 percent Post-industrial recycled material.
 - 2. Weight Bearing Design Capacity: 3300 lbs per pedestal.
 - 3. Supporting Base:
 - a. Surface Area: 49.6 square inches (320 sq. cm.).
 - b. Four 1/4 inch (6 mm) diameter holes for drainage and / or mechanical attachment
 - c. Model NM1: 1 inch – 1.57 inch (25-40 mm)
 - d. Model NM2: 1.57 inch – 2.75 inch (40-70 mm)
 - e. Model NM3: 2.36 inch – 3.93 inch (60-100 mm)
 - f. Model NM4: 3.54 inch – 6.30 inch (90-160 mm)
 - g. Model NM5: 5.90 inch – 10.63 inch (150-270 mm)
 - h. Model P NM: NM Extension 5 inch (165 mm)
 - i. Model Slope Compensator: Compensates 0 – 1 percent Slope
 - j. Model NM Head: XL 6 inch Fixed Head.
- C. Eterno Fixed Pedestal Supports:
 - 1. Material Mineral Filled High Density Copolymer Polypropylene. Contains 100 percent post-industrial recycled material.
 - a. Model: EH12 1/2 inch (12 mm) tall Fixed Head Stackable (Maximum qty 2 allowed)
 - b. Model: EH15 5/8 inch (20 mm) tall Fixed Head Stackable (Maximum qty 2 allowed)
 - c. Model: EH20 3/4 inch (20 mm) tall Fixed Head Stackable (Maximum qty 2 allowed)
- D. Eterno Fixed EPDM Rubber Pedestal Supports
 - 1. Material: SBS recyclable rubber
 - a. Model: RUB14 1/4 inch (6mm) tall Fixed Head Stackable (Maximum qty 2 allowed)
 - b. Model: RUB38 3/8 inch (10mm) tall Fixed Head Stackable (Maximum qty 2 allowed)
 - 2. Alternative Head Options:
 - a. Pins for IPE Wood Paver Applications
- E. Shims:
 - 1. Model: LGH2 1/16 inch (2 mm) thick, 4 inch diameter
 - 2. Model: LGH3 1/8 inch (3 mm) thick, 4 inch diameter
 - 3. Model: LH3 Leveling Disc 1/8 inch (3 mm) thick, 6 inch diameter

2.4 WOOD PAVER TILES

- A. Deck Tiles: Deck Tiles manufactured of Naturally Durable Hardwood, Itauba / FSC Certified and corrosion resistant fasteners.
 - 1. Moisture Content: KD, moisture content of 12 to 18%

2. Surface: Deck Tiles to be manufactured from components which are S4S (surfaced four sides), E4E (eased four edges). Edges shall be eased to a radius of 1/8 inch.
 3. Dimensional Tolerance:
 - a. Deck Tiles shall be specified in actual or net dimensions. 1 net 1.5 inch thick x 23-7/8 inches (600mm) wide x 23-7/8 inches (600mm) long.
 - b. Dimensions shall be plus or minus 0.125 inch in width and length and 0.0625 inch in thickness, measured at 12 to 18 percent moisture content.
 4. End Coating: Deck Tiles are to be supplied with the ends sealed with Anchorseal, Paraffin or approved wax end sealer. All lumber must be resealed after cutting to reduce end splits.
 5. Fabrication: Deck Tiles shall be fabricated using Decay Resistant Screws as per fabrication shop drawing supplied by manufacturer
- B. Mechanical Properties of Deck Tiles/Decking: Meet or exceed the following when tested in accordance with ASTM D 143:
1. Bending Strength: 22,445 psi
 2. Modulus of Elasticity: 3,145,000 psi/
 3. Compression Parallel to Grain: 13,140 psi.
 4. Compression Perpendicular to Grain: 3,595 psi.
 5. Average Air-Dry Density: Ranges from 56.7 to 59.3pcf.
 6. Basic Specific Gravity: Ranges from 0.85-0.97.
- C. Coefficient of Friction: Meet or exceed the Minimum Static Coefficient of Friction for High Traction in accordance with ANSI B101.1 and Dynamic Coefficient of Friction for High Traction in accordance with ANSI A137.1 section 9.6.
1. Dynamic: Wet .40 FP.
 2. Static: Wet .60 FP.
- D. Fire Rating Requirements: Meet or exceed the following.
1. Lumber supplied shall be naturally fire resistant without the use of any fire resistant treatments to meet NFPA Class A, 2007 edition.
- E. Grade Requirements: Grading Face, Back Face, and Edges – Clear All Heart.
1. Include - Appearance characteristics.
 2. Include - Physical characteristics which can be removed using normal installation methods, tools, or sanding.
 3. Exclude - Sound defects.
 4. Exclude - Unsound defects.
 5. Exclude - Milling defects.
- F. Packaging Requirements: Units shall be individually strapped to wood pallets or blocking of a minimum thickness to allow the egress of lift forks using high strength strapping with a minimum of 4 straps per crate.
- G. Uplift Master Plan Sheet: Provide Uplift Master Plan Sheet signed and sealed by an engineer licensed in the state of installation. Wind Uplift Master Plan Sheet shall outline specific installation requirements based on site specific wind uplift parameters established by the designer.
- H. Certificates of Compliance Deck Tiles: Provide deck tiles that comply with the following. Documentation shall be submitted with bid as verification of vendor ability to comply. Original submittals shall be supplied upon delivery.
1. Certificate of Compliance "Inspection": A vendor certificate confirming product compliance with specified grade.

2. Certificate of Compliance "Technical": A vendor certificate confirming product compliance with minimum specified Mechanical, Fire Resistance, Coefficient of Friction Technical Performance requirements.
 3. MSDS (Material Safety Data Sheet): Submit a Material Safety and Data Sheet for the wood products supplied on the project.
- I. Compliance with Environmental Requirements: Provide deck tiles that comply with the following. Documentation shall be submitted with bid as verification of vendor ability to comply. Original submittals shall be supplied upon delivery.
1. Green by Nature Compliance: All lumber shall meet minimum environmental requirements as defined under Green By Nature...Build With Conscience™ Controlled Wood, Chain of Custody, Life Cycle Impact and Due Care – Environmental Compliance Standards, Policies and Procedures confirming that:
 - a. All products have been verified of legal origin and compliance as being, legally harvested, transported, exported, imported and documented in compliance with all country of origin, international and domestic laws, rules, regulations and treaties pertaining to the fair and legal trade of forest products including but not limited to the U.S. Department of Agriculture Lacey Act, ITTA (International Tropical Timber Trade Agreement), CITES (Convention On The International Trade of Endangered Species), and U.S. Buy American Act.
 - b. All products are derived from forests which are naturally occurring, renewable and sustainable and are not harvested from forests or forest plantations where traditional or civil rights have been violated, forests having high conservation values which are threatened, forests that have been genetically modified or forests which have been converted to non-forest use. All packaging materials have been kiln dried and or fumigated and are free from live and or invasive insect, plant or animal species.
 - c. All wood products are 100 percent organic and grown without the use of chemical fertilization and are regenerated naturally or by seeding and replanting. The natural service life exceed their natural growth cycle, trap and store carbon and are able to be reclaimed, reused or recycled Wood pavers are also safe for human and animal contact, meet Low VOC emission standards and meet International Building Code and International Residential Code requirements for naturally durable wood.
 2. USGBC LEED Compliance Requirement Only: Certified Wood: Materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
- J. Protection Course, provided by installer if detailed on the Drawings: Protection board (required over insulated BUR systems, and when specified for use over bituminous asphalt-based waterproofing): W.R. Meadows Vibraflex or equal, minimum 3/8 inch thick asphaltic composition protection board.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.

- B. Substrate must be clean and free of projections and debris that could impair the performance of the pedestals or the total deck system.
- C. Verify all elevations, required pedestal heights and deck dimensions before commencing work.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- B. Clean surfaces thoroughly prior to installation.
- C. Establish accurate lines, levels and patterns.
- D. Verify that substrate to receive the deck supports is structurally capable of carrying the dead and live loads anticipated.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Grid Layout and Elevations:
 1. Once the starting point and the finished elevation of the deck surface have been determined, the "Top of Pedestal Elevation" (finished elevation less decking paver or tile thickness) shall be established and marked around the perimeter using a transit water level or laser leveling device.
 2. Precise measurements shall be taken and deck area should be accurately defined. Mark off and square up all outside edges with control lines using snapped chalk lines. Mark two lines that are perpendicular to each other across the deck area. Continue to mark a grid of lines in both directions marking the location of each pedestal. Use the control lines as references to periodically check and assure a square layout during installation.
 3. Pedestals shall be placed where each measured grid line meets the perimeter. Remove two spacer tabs in line with one another atop each pedestal system placed around the perimeter. Remove all four spacer tabs at corners.
 4. Adjust each pedestal height to the top of pedestal elevation marked on the perimeter. Position the pedestal as close to the edge of the perimeter as possible, with the two remaining spacer tabs aligned with the grid line. Using the elevation marked on the perimeter, stretch a mason's line along and slightly ahead of the second row of pedestals. A laser leveling device may also be used for this purpose.
 5. On larger decks, it is recommended that pedestal system be pre-assembled and pre-set to the proper elevation and placed in position prior to the installation of decking paver or tile.
 6. As the pedestals located along the grid lines are loaded with pavers or tiles, fine vertical height adjustment can be made by inserting and rotating, from the top, a T-handle hex key in to the Insert of the pedestal assembly. Clockwise rotation of the Insert will raise the bearing surface and the deck. Counter-clockwise rotation will lower the top bearing surface and deck.

7. Maintain adequate thread engagement. Pedestal inserts contain a Screw Block System that indicates when units have safely reached their maximum height adjustment. If the height required goes beyond the insert limit select the appropriate pedestal configuration to facilitate height adjustment within safety limits.
 8. Slight irregularities in decking paver or tile thickness shall be compensated for by using one to two shim segments. Place on top of the pedestal, under the corners of the decking paver or tile. Use no more than two shims on top of the pedestal and always adhere quartered wedges with construction adhesive.
 9. Stackable pedestals may be used for limited and or fixed height requirements up to 1.25 inch. Complete deck and grid layout as specified. Stack no more than two fixed height stackable pedestals together and place in lieu of adjustable pedestals where needed. Spacer tabs can be removed or pedestals can be segmented to accommodate perimeter and corner support locations.
- C. Slope and Height Compensation:
1. Stackable pedestals can be used to provide limited slope and height compensation to maintain a level decking surface over sloping substrates using a combination of pedestals and shims.
 2. Self-leveling pedestals can provide both slope and height compensation from 0 to 5 percent to maintain a level decking surface over sloping substrates by selecting the appropriate pedestal combination of base, extension and self-leveling head to meet general height requirements.
 3. Pedestals shall be designed to be rotated for final precise adjustment when they are fully loaded. Pedestals shall be leveled in each succeeding row as the installation proceeds. Final height adjustment or maintenance is easily made by using a T-handle hex key that allows adjustment of the pedestals without removing the pavers. Insert T-handle hex key between the four paver corners to engage Insert portion and is adjusted clockwise or counter clockwise to level as needed.
 4. Use shims in multiples, whole or quarters, and placed under the pedestal base or on top the pedestal cap to level pedestals. Use a small amount of construction adhesive to adhere sections of shims and/or whole shims to each other or to the pedestal. Do not use construction adhesive to adhere pedestal or shims to insulation, roofing or waterproofing membrane. Additional sections of shims may be used and should be available for regular maintenance.

3.4 PERIMETER CONTAINMENT

- A. Areas of the pedestal deck that is not restrained by a parapet or foundation wall shall be boxed-in and contained to prevent movement. Install perimeter framing and edging boards at the outside of the deck perimeter to provide restraint. Movement at the perimeter of the deck system greater than one tab width is not allowed.

3.5 FIELD QUALITY CONTROL

- A. Inspect often during installation to assure that grid spacer lines are being maintained in a straight and consistent pattern and that deck pavers or tiles are level and not rocking. Unless otherwise specified in writing to allow for expansion, inspect to assure that all paver spacing between tiles and at perimeter walls does not exceed a tab width.

1. Assure that all pedestrian entry or access points to the deck are level and that the deck surface tiles are not randomly raised or uneven creating a tripping or safety hazard.
2. Confirm that deck pedestal height excess of sixteen inches have been braced in accordance with manufacturer's written instructions.

3.6 REPAIRING AND CLEANING

- A. Inspect pavers for rocking and secure and adjust to prevent tripping hazard. Realign pavers as required.
- B. Remove and replace pavers that are chipped, broken, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with no evidence of replacement.
- C. Clean stains and soiling from exposed paver surfaces.

END OF SECTION