

SECTION 072210 – SHREDDED TIRE ROOF INSULATION BLOCK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. ECHO Block: Cementitious recycled shredded tire roof insulation block.
2. ECHO Flow: Cementitious recycled shredded tire permeable top layer insulation block.
3. ECHO Bag: Bagged, shredded tire to be mixed with Portland Cement for onsite use.
4. ECHO Turf: Artificial turf.
5. ECHO Bond: Adhesive for artificial turf.

- B. Related Requirements:

1. Section 072124 “Extruded Polystyrene Insulation”
2. Section 072713 “SBS Modified Bituminous Sheet Vapor Retarders & Air Barriers”
3. Section 073370 “Green Roof & Waterproofing”
4. Section 077600 “Roof Paver”
5. Section 321816 “Synthetic Grass Surfacing System – Roof Decks”

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)

1. ASTM C495 – Compressive Strength
2. ASTM C293-16 – Standard Test Method for Flexural Strength of Concrete.
3. ASTM D6164 – Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
4. ASTM E90/E1332 - Standard Method for Laboratory Measurement of Airborne Sound Transmission.

- B. Underwriters Laboratory, Inc. (UL)

1. Class A Fire Rating: UL 790 – Test Methods for Fire Test of Roof Coverings
2. UL 2218: Standard for Impact Resistance of Prepared Roof Covering Materials.

- C. Miami Dade County Notice of Acceptance (NOA) No.: 18-0326.05.

1.4 ACTION SUBMITTALS

- A. Manufacturer's Product Data: For each product.
- B. Sustainable Design Submittals: Submit manufacturer's specifications and installation instructions for roof insulation blocks. Include data substantiating that materials comply with specified requirements.
 - 1. Low Emitting Materials: Submit manufacturer's Material Safety Data Sheet Indicating VOC limits of all products.
 - 2. Recycled Content:
 - (a) Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
 - (b) Indicate relative dollar value of recycled content product to total dollar value of product included in project.
 - (c) If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by volume.
 - (d) If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

1.5 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Provide the following test reports performed by a qualified testing agency:
 - 1. Roof System Thermal Resistance (R-Value).
 - 2. Thermal Transmittance (U-Factor).
 - 3. Thermal Conductance (C-Factor).
 - 4. Compressive Strength (psi).
 - 5. Impact Resistance.
 - 6. Flexural Strength.
 - 7. Accelerated Age Test Report.
 - 8. Regionally Manufactured Components.
 - 9. UL Water Flow Test
 - 10. Florida Department of Environmental Protection: FS 2300 Drinking Water Sampling.

1.6 QUALITY ASSURANCE

- A. Fire Ratings: Comply with local Building and Fire Prevention Code requirements for fire resistance.
- B. Thermal Conductivity: Provide thickness required to produce the average R-Value specified. The thickness specified is for the thermal conductivity, k-value at 75 degrees Fahrenheit.

Provide adjusted thickness as directed for the equivalent use of material having a different thermal conductivity.

C. Conflicts or Inconsistencies:

1. Should a conflict or inconsistency exist between any manufacturer's requirements and Miami-Dade NOA or applicable local requirements, the more stringent requirement prevails and shall be followed. Shredded Tire, Inc. shall be notified in writing if any such conflicts are discovered.

D. Structural Deck Requirements:

1. Structural Concrete Deck.
2. Steel Deck:
 - (a) Minimum 22 gauge.
 - (b) Minimum Grade 33.
 - (c) 1.5-inch Type B.

E. Approved Vapor Barrier (if applicable to project):

1. Approved and properly installed ASTM D6164 Type 1, Grade FR GR heat-welded cap sheet products listed in applicable Shredded Tire, Inc. Miami-Dade NOA are intended for unlimited exposure. No vapor barrier substitutions will be considered.

F. Tapered Insulation Block Slopes:

1. ECHO BLOCK: Manufactured to provide ¼-inch per foot sloped substrate for code compliant installation of membrane/waterproofing. Typically installed in 4-way slope configurations.
2. ECHO FLOW: (PERMEABLE TOP LAYER). Manufactured with ¼-inch per foot (counter-sloped/opposite slope of ECHO BLOCK). Installed above approved waterproofing/roof system to neutralize slope created by ECHO BLOCK. Creates level/walkable surface for approved overburden applications.

G. Installer Qualifications

1. Contractor shall be authorized by the manufacturer to install specified materials prior to the bidding period through satisfactory project completion.
2. Contractor shall provide full time, English speaking, on-site superintendent or foreman, properly trained by the manufacturer.
3. Applicators shall be skilled in the application methods for all materials.
4. Contractor shall maintain a daily record, on-site, documenting material installation and related project conditions.
5. Contractor shall maintain a copy of all submittal documents on-site, available at all times for reference. Contractor's full-time on-site representative is required to thoroughly review and be knowledgeable of submittal documents and project requirements.

H. Testing and Inspections

1. Integrity Test: Required after installation of waterproofing/roof system and shall be performed in accordance with ASTM D5957. Water may be maintained for a period longer than 24 hours if required.
2. Inspection: Contractor, representatives of Shredded Tire Inc. and waterproofing/roof manufacturer shall inspect ECHO BLOCK and waterproofing/roof installation prior to installation of ECHO FLOW. ECHO FLOW assembly shall be inspected by representatives of Shredded Tire, Inc. prior to installation of overburden. Contractor shall be notified in writing of any defects. All defects shall be corrected.

1.7 PROJECT CONDITIONS

- A. Examination of Substrate: Examine the substrate and the conditions under which the work is to be performed. Do not proceed with installation until unsatisfactory conditions have been corrected.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect materials from damage due to moisture, physical damage, and other detrimental factors. Comply with manufacturer's written instructions for handling, storing, and protecting materials during installation.

1.9 WARRANTY

- A. Waterproofing/Roof system manufacturer's warranty: Provide manufacturer's 20-year written full warranty, No Dollar Limit (NDL), to include waterproofing/roof system and related components. Comply with manufacturer's requirements as necessary to provide specified warranty.
- B. Shredded Tire Roof Insulation Block system warranty: Provide manufacturer's 50-year written warranty for Shredded Tire, Inc. insulation block system.
- C. Styrofoam Highload EPS Insulation warranty: Provide Dow Building Solutions 50-year thermal (R-value) warranty (as applicable to project).
- D. Contractor's Warranty: Provide installer's 2-year warranty, in which installer agrees to repair or replace components of waterproofing/roof system, Shredded Tire Roof Insulation Block system, and Styrofoam Highload insulation system (as applicable to the project) that fail in materials and workmanship within the specified warranty period. Failure includes, but not limited to roof leaks.

PART 2 – PRODUCTS

2.1 ECHO BLOCK

- A. 24" W X 24" L X 2" Minimum, ¼-inch per foot tapered block of cementitious recycled shredded tire (TOP LAYER) roof insulation block, which includes an 8,000-psi structural mortar/grout surface.
 - 1. Miami Dade NOA No.: 18-0326.05.
 - 2. UL Class A Fire Rating at Unlimited Slope.
 - 3. Recycled Content: 87%.
 - 4. Roof System Thermal Resistance (R-Value): .62 per inch.
 - 5. Thermal Transmittance (U-Factor): .420
 - 6. Thermal Conductance (C-Factor): 1.634.
 - 7. Compressive Strength (psi): Pre-Weathered 92 psi, Post Weathering 129 psi.
 - 8. Manufactured By: Shredded Tire, Inc., 6742 NW 17th Ave. Ft. Lauderdale, FL. 33309.

2.2 ECHO FLOW

- A. 24" W X 24" L X 2" Minimum, ¼-inch per foot (counter-sloped) block of cementitious recycled shredded tire PERMEABLE top-layer roof insulation block which can also be installed as an optional base-layer and/or optional mid-layer component.
 - 1. Miami Dade NOA No.: 18-0326.05.
 - 2. UL Class A Fire Rating at ¼-inch per foot slope.
 - 3. Recycled Content: 93%.
 - 4. Roof System Thermal Resistance (R-Value): 1.30 per inch.
 - 5. Thermal Transmittance (U-Factor): .234.
 - 6. Thermal Conductance (C-Factor): .809.
 - 7. Compressive Strength (psi): Pre-Weathered 92 psi, Post Weathering 129 psi.

8. 5,000 hour Accelerated Age Testing in accordance with ICC-ES AC 48 Weathering.
9. Dept. Environmental Protection, FS 2300 Drinking Water Sample Testing: Meets regulated standards for potable drinking water.

10. UL Water Flow Rate Testing

(a) 4-inch thick sample:

1. 8lbs (pre-wetting) water in 20 seconds.
2. 40lbs water in 35 seconds.

(b) 12-inch thick sample:

1. 8lbs (pre-wetting) water in 20 seconds.
2. 40lbs water in 65 seconds.

11. Manufactured By: Shredded Tire, Inc., 6742 NW 17th Ave. Ft. Lauderdale, FL. 33309.

2.3 ECHO FLOW FILL

- A. 24" W X 24" L X 2" Minimum, non-sloped block of cementitious recycled shredded tire fill-layer roof insulation block.

1. Miami Dade NOA No.: 18-0326.05.
2. UL Class A Fire Rating.
3. Recycled Content: 93%.
4. Roof System Thermal Resistance (R-Value): 1.30 per inch.
5. Thermal Transmittance (U-Factor): .234.
6. Thermal Conductance (C-Factor): .809.
7. Compressive Strength (psi): Pre-Weathered 92 psi, Post Weathering 129 psi.
8. 5,000 hour Accelerated Age Testing in accordance with ICC-ES AC 48 Weathering.
9. Florida Dept. Environmental Protection, FS 2300 Drinking Water Sample Testing: Meets regulated standards for potable drinking water.

10. UL Water Flow Rate Testing

(a) 4-inch thick sample:

1. 8lbs (pre-wetting) water in 20 seconds.
2. 40lbs water in 35 seconds.

(b) 12-inch thick sample:

1. 8lbs (pre-wetting) water in 20 seconds.
2. 40lbs water in 65 seconds.

11. Manufactured By: Shredded Tire, Inc., 6742 NW 17th Ave. Ft. Lauderdale, FL. 33309.

2.4 ECHO BAG

- A. Bagged, shredded tire to be mixed with Portland cement (compliant with ASTM C150) for onsite mixture for use around penetrations. Follow manufacturer's mixing and installation guidelines.
 - 1. Miami Dade NOA No.: 18-0326.05.
 - 2. Manufactured By: Shredded Tire, Inc., 6742 NW 17th Ave. Ft. Lauderdale, FL. 33309.

2.5 ECHO TURF

- A. Synthetic Grass Surfacing System for Roof Decks
 - 1. Miami Dade NOA No.: 18-0326.05.
 - 2. UL Class A Fire Rating.
 - 3. Linear Density: Not less than 4,200 Denier; ASTM D 1557.
 - 4. Pile Weight: Total pile weight 56 oz/sq yd; ASTM D 5848.
 - 5. Primary Backing Weight: 8 oz/sq yd; ASTM D 5848.
 - 6. Secondary Backing Weight: Average 20 oz/sq yd; ASTM D 5848.
 - 7. Total Weight: 84 oz/sq yd; ASTM D 5848.
 - 8. Tuft Bind: Not less than 8 lbs; ASTM D 1335.
 - 9. Flame Resistance: Pass; ASTM D 2859.
 - 10. Drainage Through Fabric: Not less than 30 inches per hour; ASTM F 1551.
 - 11. Manufactured By: Shredded Tire, Inc., 6742 NW 17th Ave. Ft. Lauderdale, FL. 33309.

2.6 ECHO BOND

- A. Adhesive for ECHO TURF.
 - 1. Miami Dade NOA No.: 18-0326.05.
 - 2. UL Class A Fire Rating.
 - 3. Manufactured By: Shredded Tire, Inc., 6742 NW 17th Ave. Ft. Lauderdale, FL. 33309.

2.7 STYROFOAM HIGHLOAD INSULATION

- A. Extruded Polystyrene Foam Insulation board.
 - 1. Minimum 60 psi required.
 - 2. Minimum 2-inch thickness required.
 - 3. Installed in accordance with Miami Dade NOA No.: 18-0326.05.
 - 4. Roof System Thermal Resistance (R-Value): 5.0 per inch.
 - 5. Compressive Strength (psi): Minimum Highload 60 (60 psi) required.
 - 6. Manufactured By: Dow Building Solutions, 200 Larkin Center, 1605 Joseph Dr. Midland, MI 48674.

2.8 INSULATION ADHESIVE

- A. Polyset AH-160 two-component polyurethane foam adhesive.
 - 1. Miami Dade NOA No.: 17-0322.03, FBC Product Approval No.: FL6332-R8.
 - 2. UL Class A Fire Rating.
 - 3. Manufactured by: ICP Adhesives, Inc., 12505 NW 44th St. Coral Springs, FL 33065.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examination includes visual observations, qualitative analysis, and quantitative testing measures as necessary to ensure conditions remain satisfactory throughout the project.
- B. Contractor shall examine all roofing substrates including, but not limited to structural decks, walls, curbs and curb attachment, rooftop equipment, fixtures and attachment, and drainage. Contractor shall report, in writing, any deficiencies or concerns which require corrective measures.
- C. Installation shall not commence until conditions have been properly examined and determined to be clean, dry, and otherwise satisfactory to receive specified materials.

3.2 PREPARATION

- A. Verify that work done by other trades meet the following requirements:
 - 1. Structural deck, walls and curbs are sound, clean, dry, and contain no voids or deficiencies.
 - (a) Roof drains are complete and properly installed to the correct heights based on project design.
 - (b) Equipment supports, curbs and roof penetrations are properly secured and of adequate height to accommodate new insulation block and waterproofing/roof installation.
 - 2. Work area is clear and free of equipment, scaffolding, and materials from other trades.

3.3 INSTALLATION

A. General

1. Comply with each manufacturer's current Miami-Dade County Notice of Acceptance (NOA).
2. Work shall be performed in accordance with contract documents, approved shop drawings, and each manufacturer's written installation instructions and applicable warranty requirements.

B. Vapor Barrier (OPTIONAL / if applicable to project):

1. Primer application:

- (a) Examine all substrates, and conduct adhesion peel tests as necessary, to ensure satisfactory adhesion is achieved.
- (b) Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified materials.
- (c) Apply primer using brush, roller, or sprayer at the rate published on the product data sheet or Miami-Dade Notice of Acceptance (NOA). Should a conflict or inconsistency exist between manufacturer's requirements and Miami-Dade NOA, the more stringent requirement shall be followed.
- (d) Asphalt Primer: Apply primer to dry compatible masonry, metal, and other required substrates before applying heat-welded membrane plies. Primer is optional for solvent based SBS adhesives and cements, refer to product data sheets and manufacturer's installation requirements.
- (e) Project conditions vary throughout the day. Monitor changing conditions, monitor the drying time of primers, and monitor the adhesion of the vapor barrier. Adjust primer and membrane application methods as necessary to achieve the desired results.

2. Torch-applied Vapor Barrier:

- (a) Follow material product data sheets and manufacturer's requirements for installation instructions.
- (b) Ensure environmental conditions are safe and satisfactory, and will remain safe and satisfactory, during the application of the heat-welded vapor retarder membrane.
- (c) Ensure all primers are fully dry before beginning heat-welding operations.

- (d) Unroll membrane onto the roof surface and allow time to relax prior to heat welding.
- (e) Starting at the low point of the roof, lay out the membrane to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- (f) Ensure all roofing and flashing substrates are prepared and acceptable to receive the heat-welded membrane.
- (g) Cut membrane to working lengths and widths to conform to rooftop conditions. Lay out to always work to a selvage edge.
- (h) Ensure specified side-laps and end-laps are maintained. End-laps should be staggered 3 ft apart.
- (i) Direct roof torch on the roll as necessary to prevent overheating and damaging the membrane and substrates.
- (j) As the membrane is unrolled, apply heat to the underside of the membrane until the plastic burn-off film melts away. Continuously move the torch side-to-side across the underside of the roll to melt the bitumen on the underside of the sheet, while continuously unrolling the membrane.
- (k) While unrolling and heating the sheet, ensure a constant flow hot bitumen approximately $\frac{1}{4}$ to $\frac{1}{2}$ in flows ahead of the roll as it is unrolled, and there is $\frac{1}{8}$ to $\frac{1}{4}$ in bleed out at all laps.
- (l) Adjust the application of heat to the underside of the membrane and to substrate as required for varying substrates and environmental conditions.
- (m) At end-laps, cut a 45-degree dog-ear away from the selvage edge, or otherwise ensure the membrane is fully heat-welded watertight at all T-joints.
- (n) Each day physically inspect all side and end-laps, and ensure the membrane is sealed watertight. Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
- (o) Inspect the installation each day to ensure the plies are fully adhered. Repair all voids, wrinkles, open laps and all other deficiencies.

C. Styrofoam Highload Extruded Polystyrene Insulation (OPTIONAL / if applicable to project):

1. Minimum 60 psi Styrofoam Highload EPS insulation can be installed in a base-layer and optional mid-layer (or “fill”) configuration. When applicable, minimum 2-inch thick, flat (non-tapered) insulation panels shall be installed below ECHO Block (sloping mechanism for approved waterproofing/roof system) to achieve project R-value requirements.
2. Provide sizes to fit project requirements, selected from manufacturer's standard thicknesses, widths, and lengths. Each single layer of insulation must meet minimum 2-inch thickness requirement. Ensure combined thickness of insulation layers installed meets project R-value requirements.
3. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement. Pre-cut insulation panels and ensure proper fitment prior to Polyset AH-160 adhesive application.
4. Where multiple insulation layers occur, stagger joints of each succeeding layer from joints of previous layer a minimum 6-inches in each direction.
5. Ensure substrate or vapor-barrier is clean of dust and debris, dry, and otherwise suitable for insulation adhesive.
6. Adhere each layer of insulation with 1-1/2-inch wide beads of ICP Adhesives Polyset AH-160 spaced 6-inches on center per Shredded Tire, Inc. Miami Dade Notice of Acceptance (NOA).
7. Apply adhesive to substrate or vapor-barrier (if applicable) in accordance with manufacturer's installation requirements.
8. Apply weight to top of newly installed insulation board to promote proper bonding of insulation adhesive and maintain alignment with adjacent insulation boards.
9. Insulation and Polyset AH-160 adhesive installation requirements are the same whether application is being installed over (optional) vapor barrier, structural concrete deck or minimum 22-gauge, Grade 33, 1.5-inch Type B steel deck.
10. Protect installed insulation from damage due to prolonged U.V. exposure, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

D. ECHO Flow (Fill):

1. ECHO Flow (Fill), a non-tapered ECHO Flow roof insulation block (minimum 2-inch thickness) can be installed as base-layer and mid-layer fill-boards over (optional) Styrofoam Highload EPS insulation, (optional) vapor barrier, or direct to structural concrete or steel deck depending on project requirements. ECHO Flow (Fill) is adhered with Polyset AH-160 adhesive.

The top-layer application of ECHO Flow (Fill) is the final component of the Shredded Tire, Inc. Roof Insulation Block system and is adhered with Polyset AH-160 adhesive over the ECHO Flow ¼-inch per foot counter-sloped insulation blocks. This top permeable layer aids with water absorption and provides a suitable substrate for overburden application. Refer to applicable Miami Dade Notice of Acceptance (NOA) and Shredded Tire, Inc. installation details and guidelines.

- (a) Extend ECHO Flow (Fill) layer to envelop entire area to receive block. Fit tightly around obstructions and fill voids using ECHO BAG in accordance with manufacturer's installation requirements. Remove projections that interfere with placement. Pre-cut ECHO Flow (Fill) insulation blocks and ensure proper fitment prior to application of Polyset AH-160 adhesive.
- (b) Ensure substrate is clean of dust and debris, dry, and otherwise suitable for grout installation.
- (c) Set each mid-layer and top-layer block of ECHO Flow (Fill) in 1-1/2-inch wide beads of ICP Adhesives Polyset AH-160 spaced 6-inches on center. Refer to Shredded Tire, Inc. Miami Dade Notice of Acceptance (NOA).
- (d) Apply adhesive in accordance with manufacturer's installation requirements.
- (e) Provide sizes to fit project requirements based on manufacturer's approved project specific insulation block layout diagram. Select from manufacturer's standard thicknesses, widths, and lengths. Each single layer of insulation block must meet minimum 2-inch thickness requirement.
- (f) Apply weight to top of each newly installed ECHO Flow (Fill) block to promote proper bonding and maintain alignment with adjacent blocks.

E. ECHO Block:

2. ECHO Block is a top-layer roof insulation block that can be installed directly to structural deck, installed over (optional) approved vapor barrier, installed over (optional) Styrofoam Highload EPS insulation, or installed over (optional) ECHO Flow (Fill) block. ECHO Block is manufactured in ¼-inch per foot tapered blocks and includes an 8,000-psi structural mortar/grout surface for application of approved water-proofing/roof system.

Refer to applicable Miami Dade Notice of Acceptance (NOA) and Shredded Tire, Inc. installation instructions.

3. Provide sizes to fit project requirements based on manufacturer's approved project specific insulation block layout diagram. Select from manufacturer's standard thicknesses, widths, and lengths. Each single layer of insulation block must meet minimum 2-inch thickness requirement.
4. Extend ECHO Block to envelop entire area to be insulated (as applicable). Fit tightly around obstructions and fill voids using ECHO BAG in accordance with manufacturer's installation requirements. Remove projections that interfere with placement. Pre-cut ECHO Block insulation blocks and ensure proper fitment prior to Polyset AH-160 adhesive application.
5. Ensure substrate is clean of dust and debris, dry, and otherwise suitable for insulation adhesive.
6. Adhere each block of ECHO Block with 1-1/2-inch wide beads of ICP Adhesives Polyset AH-160 spaced 6-inches on center per Shredded Tire, Inc. Miami Dade Notice of Acceptance (NOA).
7. Apply adhesive in accordance with manufacturer's installation requirements.
8. Apply weight to top of each newly installed ECHO Block to promote proper bonding of insulation adhesive and maintain alignment with adjacent insulation blocks. Refer to manufacturer's installation guidelines.

F. ECHO Flow :

1. ECHO Flow 1/4-inch per foot counter-sloped permeable roof insulation block (minimum 2-inch thickness) is installed over an approved waterproofing/roof system applied to the 1/4-inch per foot tapered ECHO Block insulation blocks in an application of grout.

ECHO Flow is manufactured with a negative slope (opposite slope of ECHO Block) thereby neutralizing the slope created by the ECHO Block resulting in a level/walkable substrate ideal for approved overburden applications.

A final layer of ECHO Flow (Fill) non-sloping block is then installed over the ECHO Flow before installation of an approved over-burden assembly. Refer to applicable Miami Dade Notice of Acceptance (NOA) and Shredded Tire, Inc. installation requirements.

2. Provide sizes to fit project requirements based on manufacturer's approved project specific insulation block layout diagram. Select from manufacturer's standard thicknesses, widths, and lengths. Each single layer of insulation block must meet minimum 2-inch thickness requirement.

3. Extend ECHO Flow to envelop entire application area (as applicable). Fit tightly around obstructions and fill voids using ECHO BAG in accordance with manufacturer's installation requirements. Remove projections that interfere with placement. Pre-cut ECHO Flow insulation blocks and ensure proper fitment prior to grout embedment.
4. Ensure substrate is clean of dust and debris, dry, and otherwise suitable for grout installation.
5. Set each block of ECHO Flow (Fill) (base-layer) in a minimum ½-inch layer of any ASTM C1107, 8000 psi non-shrink high strength construction mortar/grout and let cure for minimum 24-hours before covering.
6. Apply weight to top of each newly installed ECHO Flow to promote proper bonding of insulation adhesive and maintain alignment with adjacent insulation blocks. Refer to manufacturer's installation requirements.

G. Approved Overburden:

A. ECHO Turf:

1. Thoroughly clean the area to receive the synthetic grass system of foreign material and all other substances and materials that may be detrimental to permeability and/or installation of the synthetic grass system.
2. Synthetic grass surfacing fabric rolls shall be unrolled and allowed to relax prior to installation.
3. Synthetic grass surfacing fabric rolls shall be installed across entire width of area, parallel to long dimension, or as directed by the Architect.
4. Rolls shall extend from edge to edge. Cross seams are not allowed. Rolls shall be rolled out in same direction and installed with uniform pile direction of fibers.
5. Rolls shall be laid straight and true to line. Adjacent rolls, when laid together, shall form a tight-fitting seam for the entire length of the fabric. Fitted pieces are not allowed.
6. Seams in the synthetic grass fabric rolls shall be glued together with seaming cloth, utilizing the manufacturer's standard seaming procedures and materials, ensuring that each roll is properly attached to the next.
7. Seams shall be flat, tight, and permanent, with no separation or fraying. Seams, when completed, shall display no visible signs of joining, with fibers brushed to provide full coverage of fibers over the seam.

8. Adhere ECHO Turf with ECHO Bond adhesive at a combined rate of 40 ft² per gallon with a ¼ inch nap adhesive roller.
9. Refer to manufacturer's installation instructions.

B. Paver Tile:

1. Minimum 3/4-inch thick, 24" X 24", 1,500 psi.
2. Replace pavers with chips, cracks, voids, discolorations, or other defects which may be visible in finished work.
3. Use string lines, chalk lines, or other tools necessary to ensure pattern lines are true.
4. Cut concrete pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide approved pattern and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.
5. Clean substrate to ensure good adhesion of the pavers.
6. Apply A118.4/A118.11 large format tile mortar to ECHO Flow with a ¾-inch wide X 9/16-inch deep X 3/8-inch spaced U-notched trowel leaving a 1-inch space from every edge exposed with no tile mortar for drainage purposes.
7. Back-butter each paver with same 1-inch space from every edge exposed with no tile mortar.
8. Set pavers into the mortar bed, leaving 1/8-inch gap between all pavers for proper drainage.
9. Prevent all traffic on installed paver tile until properly cured.

END OF SECTION 072100