SECTION 32 12 43

POROUS FLEXIBLE PAVING

Display hidden notes to Specifier by using "Tools"/"Options"/"View"/"Hidden Text".

\*\* NOTE TO SPECIFIER \*\* Ecoraster; Porous flexible paving products.  
.  
This section is based on the products of Ecoraster, which is located at:P. O. Box 53, 801 Tremaine Ave. S. Listowel, ON, Canada N4W 3H2Toll Free Tel: 800-495-5517Email: [request info (info@ecorastergrid.com)](https://arcat.com/rfi?action=email&company=Ecoraster&message=RE%253A%2520Spec%2520Question%2520(02795pur)%253A%2520&coid=49596&spec=02795pur&rep=&fax=)  
Web: <https://www.ecorastergrid.com>   
 [ [Click Here](https://arcat.com/company/ecoraster-49596) ] for additional information.  
Ecoraster was engineered and developed in Germany. TuV is still the guarantor of quality and reliability, "made in Germany". Ecoraster is TuV certified according to DIN 1072 our Ecoraster paving system is tested to extremely high load capacities. In addition, all of our Ecoraster products are certified to conform to DIN 38412 as absolutely environmentally neutral. Non pollutants to organisms and groundwater. An invaluable advantage of the use of ECORASTER as ground stabilization for sensitive areas such as near watersheds, agricultural land or animal husbandry. Contact with feed or food products are completely harmless  
The chief advantages and key benefits of Ecoraster are: High flexibility - will not shatter under vehicular traffic even at low temperatures; High horizontal connectivity (patented) - tested up to 5.7 kilonewtons / meter and Proven, consistent high quality - millions of square feet installed for over 20 years worldwide without failure or decomposition.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Porous Flexible Paving.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 31 20 00 - Earth Moving.
    2. Section 33 46 13.13 - Foundation Drainage Piping.
    3. Section 32 10 00 - Bases, Ballasts, and Paving.
    4. Section 32 30 00 - Site Improvements.
    5. Section 32 90 00 - Planting.
    6. Section 32 92 13 - Hydro-Mulching.
    7. Section 32 86 00 - Agricultural Irrigation.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. US Green Building Council.
  1. SYSTEM DESCRIPTION

\*\* NOTE TO SPECIFIER \*\* Select the Ecoraster® System(s) required from the following paragraphs and delete those that are not applicable.

* + 1. Ecoraster Bloxx Permeable Paving System provides structural ground reinforcement with concrete paving units as infill.
       1. Load distribution reduces applied bearing pressure on the subgrade.
       2. Reduces surface runoff and increases storm water infiltration by providing a permeable load support structure for vehicular and/or pedestrian traffic loading.
       3. Major Components include:
          1. Ecoraster Bloxx units
          2. Bloxx Concrete paving units
          3. Permeable leveling course
          4. Permeable aggregate base
    2. Ecoraster E30 Permeable Paving System provides structural ground reinforcement with confined porous aggregate infill.
       1. Load distribution reduces applied bearing pressure on the subgrade.
       2. Reduces surface runoff and increases storm water infiltration by providing a permeable load support structure for vehicular and/or pedestrian traffic loading utilizing porous aggregate infill.
       3. Major Components include:
          1. Ecoraster E30 units
          2. Parking space markers, where applicable
          3. Permeable aggregate infill
          4. Permeable leveling course
          5. Permeable aggregate base
    3. Ecoraster E40 Permeable Paving System provides structural ground reinforcement with confined porous aggregate infill.
       1. Load distribution reduces applied bearing pressure on the subgrade.
       2. Reduces surface runoff and increases storm water infiltration by providing a permeable load support structure for vehicular and/or pedestrian traffic loading utilizing porous aggregate infill.
       3. Major Components include:
          1. Ecoraster E40 units
          2. Parking space markers, where applicable
          3. Permeable aggregate infill
          4. Permeable leveling course
          5. Permeable aggregate base
    4. Ecoraster E50 Permeable Paving System provides structural ground reinforcement with confined porous aggregate infill.
       1. Load distribution reduces applied bearing pressure on the subgrade.
       2. Reduces surface runoff and increases storm water infiltration by providing a permeable load support structure for vehicular and/or pedestrian traffic loading utilizing porous aggregate infill.
       3. Major Components include:
          1. Ecoraster E50 units
          2. Parking space markers, where applicable
          3. Permeable aggregate infill
          4. Permeable leveling course
          5. Permeable aggregate base
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. 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. Manufacturer's printed installation instructions. Include methods for maintaining installed products.
     3. Shop Drawings: Project specific shop drawings shall include as a minimum: plan view, cross-section, and product data.

\*\* NOTE TO SPECIFIER \*\* Delete the following paragraphs if LEED is not applicable.

* + 1. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
       1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
       2. Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
    2. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
    3. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
       1. Product certificates signed by the manufacturer certifying material compliance of polyethylene used to make Ecoraster units.
       2. ISO Certificate certifying manufacturer's quality management system is currently registered to ISO 9001:2008 quality standards.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Manufacturer with a minimum for five years documented experience with the products specified
     2. Installer Qualifications: An experienced installer who has successfully completed installations of pavers or other pavement systems on projects of similar or larger scope and magnitude.
     3. Pre-Installation Meetings:
        1. Convene a pre-installation meeting a minimum of two weeks prior to start of plantable porous paving system.
        2. Verify project requirements, subbase and base conditions, manufacturer's installation instructions and coordination with other related work.
        3. Require attendance of parties directly affecting work of this section, including the Contractor, Architect, engineer, and installer. Manufacturer's representative may attend by phone conference as needed. Review installation procedures and coordinate installation with other work around installation area.
  2. DELIVERY, STORAGE, AND HANDLING
     1. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
     2. Storage: Store materials in accordance with manufacturer's instructions.
     3. Handling: Protect materials during handling and installation to prevent damage.
     4. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic maintenance vegetation and components.
  3. PROJECT CONDITIONS
     1. 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.
     2. Verify completion of all adjacent hardscape, paving, and mow curbs/strips indicated on the Drawings prior to the installation of the Drivable Grass paving mats.
     3. Gradients for Plantable Porous Paving System can vary from flat to 12 percent. For steeper conditions, consult with manufacturer.
     4. Cold weather applications:
        1. Coordinate maintenance contracts.
        2. Snowplow equipment operators should be educated about the underlying surface prior to beginning snow removal. Snowplow equipment should be fitted with Teflon runners or risers, which will help keep the snowplow blade from damaging the product.
        3. For sites that will require the use of heavy-duty snowplowing machinery, install mow curb/strips prior to installation of vegetated paving mats. Vegetated surfaces should be depressed 1/2 inch below the top of the mow curb/strip to protect the product from the snowplow blade.
        4. Do not use frozen materials or materials mixed or coated with ice or frost.
        5. Do not build in freezing conditions.
        6. Ensure proper drainage to avoid standing freezing water in contact with paving mats.
        7. Do not use deicing agents that are known to damage concrete such as rock salt.
     5. Protect partially completed paving against damage from other construction traffic when work is in progress and until grass root system has had time to mature after 2 mowings. Projects using aggregate infill instead of planting are drivable upon completing infill.
     6. Protect drivable grass installation and adjacent areas during construction.
  4. WARRANTY
     1. Provide with the manufacturers limited 20 year unit replacement warranty of any unit, which proves to be defective under normal use and service.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Ecoraster, which is located at:P. O. Box 53, 801 Tremaine Ave. S. Listowel, ON, Canada N4W 3H2Toll Free Tel: 800-495-5517Email: [request info (info@ecorastergrid.com)](https://arcat.com/rfi?action=email&company=Ecoraster&message=RE%253A%2520Spec%2520Question%2520(02795pur)%253A%2520&coid=49596&spec=02795pur&rep=&fax=);Web: <https://www.ecorastergrid.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Select the Ecoraster® System(s) required from the following paragraphs and delete those that are not applicable.

* 1. POROUS FLEXIBLE PAVING SYSTEM PRODUCTS
     1. Ecoraster Bloxx Plastic Units
        1. Composition:
           1. Material: 100 percent recycled low density polyethylene (LDPE)
           2. Color: Dark gray to black, uniform throughout all grids in pallet
           3. Chemical Resistance: Resistant to acids, alkalis, alcohols, oil, gasoline, de-icing salts, ammonia, acid rain, etc.
           4. Moisture absorption: 0.01 percent.
        2. Dimensions:
           1. Single unit: 13 inches by 13 inches by 2 inches (330 mm by 330 mm by 50 mm)
           2. Area, per single unit: 1.17 SF (0.111 m2)
           3. Packaging, units/pallet: VPE 1 = 65 pcs; VPE 2 = 130 pcs.
           4. Wall thickness: 0.2 inches (5 mm)
           5. Weight, per SM: Approx. 187.4 lbs (85 kg) including blocks
           6. Weight, per unit area: 17.41 lbs/ft2 (85 kg/m2)
           7. Dimensional stability: minus 58 to plus 194 degrees F (minus 50 to plus 90 degrees C); 0.5 percent, at normal temperatures, 68 to 176 degrees F (20 to 80 degrees C)
        3. Performance:
           1. Load capacity, unfilled: Up to 498 psi (350 t/m2 = 3,432 kPa)
           2. Load capacity, with Bloxx: Up to 1,138 psi (800 t/m2 = 7,845 kPa) depending on fill type
        4. Ecoraster Bloxx Concrete Paving Units
           1. Single unit: 5.51 inches by 5.51 inches by 1.77 inches (140 mm by 140 mm by 45 mm)
           2. Area, per unit: 0.211 SF (0.0196 m2)
           3. Weight, per unit: 4.67 lbs (2.12 kg)
           4. Packaging, units/pallet: VPE 1 = 260 pcs; VPE 2 = 520 pcs.
     2. Ecoraster E30 Units
        1. Composition:
           1. Material: 100 percent recycled low density polyethylene (LDPE)
           2. Color: Dark gray to black, uniform throughout all grids in pallet
           3. Chemical Resistance: Resistant to acids, alkalis, alcohols, oil, gasoline, de-icing salts, ammonia, acid rain, etc.
           4. Moisture absorption: 0.01 percent.
        2. Dimensions:
           1. Single unit: 13 inches by 13 inches by 1.2 inches (330 mm by 330 mm by 30 mm)
           2. Area, per single unit: 1.17 ft2 (0.111 m2)
           3. Packaging unit: 1 layer = 3 x 4 units = 12 units total, area = 14.3 ft2 (1.33 m2)
           4. Wall thickness: 0.17 in (4.3 mm)
           5. Weight, per unit: 1.23 lbs (0.56 kg)
           6. Weight, per unit area: 1.03 lbs/ft2 (5.04 kg/m2)
           7. Dimensional stability: minus 58 to plus 194 degrees F (minus 50 to plus 90 degrees C); 0.5 percent, at normal temperatures, 68 to 176 degrees F (20 to 80 degrees C)
        3. Performance
           1. Load capacity, unfilled: up to 356 psi (250 t/m2 = 2,452 kPa)
           2. Load capacity, filled: up to 1,138 psi (800 t/m2 = 7,845 kPa) depending on fill type
        4. Permeability and Runoff Coefficient: Dependent upon the actual site conditions and Ecoraster E30 infill material.

\*\* NOTE TO SPECIFIER \*\* Select the Ecoraster® Vegetated or Aggregate infill System infill material required from the following two paragraphs and delete the one that is not applicable.

* + - 1. Ecoraster E30 Vegetated Infill Material: Aggregate/topsoil engineered infill shall consist of a homogenous mixture consisting of:
         1. Crushed clear-stone (65-70 percent portion) having an AASHTO #8 or similar designation blended with pulverized topsoil and a void component generally containing air and/or water. This homogenous mixture will promote vegetative growth and provide required structural support.
         2. Aggregate portion shall have a particle range from 0.2 inch to 0.5 inch (5 mm to 13 mm), the percentage void-space of the aggregate portion shall be 30-35%. Pulverized topsoil portion shall be 30-35 percent of the total volume and be added and blended to produce a homogenous mixture prior to placement. The addition of long term fertilizer is optional.
      2. Ecoraster E30 Aggregate Infill Material: Aggregate infill, non-vegetated: shall be a clean, well-graded 0.10 to 0.40 in (2.5 to 10 mm) crushed angular stone with a fine content less than 3 percent.
    1. Ecoraster E40 Units
       1. Composition:
          1. Material: 100 percent recycled low density polyethylene (LDPE)
          2. Color: Dark gray to black, uniform throughout all grids in pallet
          3. Chemical Resistance: Resistant to acids, alkalis, alcohols, oil, gasoline, de-icing salts, ammonia, acid rain, etc.
          4. Moisture absorption: 0.01 percent.
       2. Dimensions:
          1. Single unit: 13 inches by 13 inches by 1.6 inches (330 mm by 330 mm by 40 mm)
          2. Area, per single unit: 1.17 ft2 (0.111 m2)
          3. Packaging unit: 1 layer = 3 x 4 units = 12 units total, area = 14.3 ft2 (1.33 m2)
          4. Wall thickness: 0.14 in (3.6 mm)
          5. Weight, per unit: 1.27 lbs (0.58 kg)
          6. Weight, per unit area: 1.07 lbs/ft2 (5.22 kg/m2)
          7. Dimensional stability: minus 58 to plus 194 degrees F (minus 50 to plus 90 degrees C); 0.5 percent, at normal temperatures, 68 to 176 degrees F (20 to 80 degrees C)
       3. Performance
          1. Load capacity, unfilled: up to 171 psi (120 t/m2 = 1,177 kPa)
          2. Load capacity, filled: up to 1,138 psi (800 t/m2 = 7,845 kPa) depending on fill type
       4. Permeability and Runoff Coefficient: Dependent upon the actual site conditions and Ecoraster E40 infill material.

\*\* NOTE TO SPECIFIER \*\* Select the Ecoraster® Vegetated or Aggregate infill System infill material required from the following two paragraphs and delete the one that is not applicable.

* + - 1. Ecoraster E40 Vegetated Infill Material: Aggregate/topsoil engineered infill shall consist of a homogenous mixture consisting of:
         1. Crushed clear-stone (65-70 percent portion) having an AASHTO #8 or similar designation blended with pulverized topsoil and a void component generally containing air and/or water. This homogenous mixture will promote vegetative growth and provide required structural support.
         2. Aggregate portion shall have a particle range from 0.2 inch to 0.5 inch (5 mm to 13 mm), the percentage void-space of the aggregate portion shall be 65-70 percent. Pulverized topsoil portion shall be 30-35 percent of the total volume and be added and blended to produce a homogenous mixture prior to placement. The addition of long term fertilizer is optional.
      2. Ecoraster E40 Aggregate Infill Material: Aggregate infill, non-vegetated: shall be a clean, well-graded 0.10 to 0.40 in (2.5 to 10 mm) crushed angular stone with a fine content less than 3 percent.
    1. Ecoraster E50 Units
       1. Composition:
          1. Material: 100 percent recycled low density polyethylene (LDPE)
          2. Color: Dark gray to black, uniform throughout all grids in pallet
          3. Chemical Resistance: Resistant to acids, alkalis, alcohols, oil, gasoline, de-icing salts, ammonia, acid rain, etc.
          4. Moisture absorption: 0.01 percent.
       2. Dimensions:
          1. Single unit: 13 inches by 13 inches by 2 inches (330 mm by 330 mm by 50 mm)
          2. Area, per single unit: 1.17 ft2 (0.111 m2)
          3. Packaging unit: 1 layer = 3 x 4 units = 12 units total, area = 14.3 ft2 (1.33 m2)
          4. Wall thickness: 0.2 in (5 mm)
          5. Weight, per unit: 2.34 lbs (1.06 kg)
          6. Weight, per unit area: 2.00 lbs/ft2 (9.55 kg/m2)
          7. Dimensional stability: minus 58 to plus 194 degrees F (minus 50 to plus 90 degrees C); 0.5 percent, at normal temperatures, 68 to 176 degrees F (20 to 80 degrees C)
       3. Performance
          1. Load capacity, unfilled: up to 498 psi (350 t/m2 = 3,432 kPa)
          2. Load capacity, filled: up to 1,138 psi (800 t/m2 = 7,845 kPa) depending on fill type
       4. Permeability and Runoff Coefficient: Dependent upon the actual site conditions and Ecoraster E50 infill material.

\*\* NOTE TO SPECIFIER \*\* Select the Ecoraster® Vegetated or Aggregate infill System infill material required from the following two paragraphs and delete the one that is not applicable.

* + - 1. Ecoraster E50 Vegetated Infill Material: Aggregate/topsoil engineered infill shall consist of a homogenous mixture consisting of:
         1. Crushed clear-stone (65-70 percent portion) having an AASHTO #8 or similar designation blended with pulverized topsoil and a void component generally containing air and/or water. This homogenous mixture will promote vegetative growth and provide required structural support.
         2. Aggregate portion shall have a particle range from 0.2 inch to 0.5 inch (5 mm to 13 mm), the percentage void-space of the aggregate portion shall be 65-70 percent. Pulverized topsoil portion shall be 30-35 percent of the total volume and be added and blended to produce a homogenous mixture prior to placement. The addition of long term fertilizer is optional.
      2. Ecoraster E50 Aggregate Infill Material: Aggregate infill, non-vegetated: shall be a clean, well-graded 0.10 to 0.40 in (2.5 to 10 mm) crushed angular stone with a fine content less than 3 percent.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly prepared.
      2. Verify compacted subgrade, granular base and leveling course are acceptable and ready to support paving and imposed loads. Notify the Engineer if not acceptable. Do not begin preparation or installation until unsatisfactory conditions have been corrected.
      3. Verify layout, gradients and elevations of subgrade and base are correct. Notify the Engineer if not acceptable. Do not begin preparation or installation until unsatisfactory conditions have been corrected.
      4. Ensure that adjacent hard-surfaced paving work is completed before installing porous pavement system.
   2. PREPARATION
      1. Subgrade:

\*\* NOTE TO SPECIFIER \*\* Coordinate paragraphs below with earthwork provided by others. Proper subgrade preparation is required to enable the units to interlock properly and remain stationary after installation.

* + - 1. Prepare subgrade as specified in Section 32 10 00 - Bases, Ballasts, and Paving. Verify subgrade in accordance with porous paving system manufacturer's instructions.
      2. Excavate area allowing for unit thickness and the engineered base depth (where required).
      3. Provide adequate drainage from excavated area if area has potential to collect water, when working with in-place soils that have poor permeability.
      4. Ensure in-place soil is relatively dry and free from standing water.
      5. Level and clear base of large objects, such as rocks and pieces of wood.
      6. Grade subgrade so that infiltrated runoff will be able to flow in required direction to drain away from porous flexible paving area.
      7. If required structurally, compact subgrade to 95 percent minimum Standard Proctor Maximum Dry Density (SPMDD) as per ASTM D 698 as specified in Section 32 10 00 - Bases, Ballasts, and Paving. For greater subgrade permeability, less to no compaction is optional.
    1. Base Preparation for Ecoraster Bloxx Plastic Units:

\*\* NOTE TO SPECIFIER \*\* Coordinate paragraphs below with base installation provided by others. Delete subdrain paragraph if not applicable. The strength of the porous pavement system is determined, in part, by the support provided by the engineered base. Consult Purus North America Inc. for engineered base details and thickness recommendations.

* + - 1. Install Base as specified in Section 32 10 00 - Bases, Ballasts, and Paving. Verify engineered base is installed in accordance with porous paving system manufacturer's instructions.
      2. Coordinate base installation and preparation with subdrains specified in Section 33 46 13.13 - Foundation Drainage Piping.
      3. If required, place a geotextile separation layer between the natural ground and the ' engineered base.
      4. Place base to the minimum thickness specified and or as indicated on the Drawings.

\*\* NOTE TO SPECIFIER \*\* Modify base material and thickness as required for project specific conditions, loading and drainage requirements.

* + - 1. Aggregate base shall be a free-draining, crushed aggregate with a fine content less than 5%.
      2. Place base thickness to the specified thickness in maximum lifts of 6 in (150 mm) compacted.
      3. Compact base to 98 percent minimum Standard Proctor Maximum Dry Density (SPMDD) as per ASTM D 698 as specified in Section 32 10 00 - Bases, Ballasts, and Paving.
    1. Leveling Course Preparation for Ecoraster Bloxx Plastic Units
       1. Leveling course material shall be 1/4 inch chip: crushed, angular stone with a well graded distribution from 0.10 to 0.25 inch (2.5 to 6.4 mm).
       2. Install leveling course as specified in Section 32 10 00 - Bases, Ballasts, and Paving. Verify leveling course is installed in accordance with porous flexible paving system manufacturer's instructions.
       3. Above levelling course before plastic element installation, install optional netting to prevent chip stone from "bouncing" into pockets of Bloxx
    2. Base Preparation for Ecoraster E30, E40 and E50 Plastic Units:

\*\* NOTE TO SPECIFIER \*\* Coordinate paragraphs below with base installation provided by others. Delete subdrain paragraph if not applicable. The strength of the porous pavement system is determined, in part, by the support provided by the engineered base. Consult Purus North America Inc. for engineered base details and thickness recommendations.

* + - 1. Install Base as specified in Section 32 10 00 - Bases, Ballasts, and Paving. Verify engineered base is installed in accordance with porous paving system manufacturer's instructions.
      2. Coordinate base installation and preparation with subdrains specified in Section 33 46 13.13 - Foundation Drainage Piping.
      3. If required, place a geotextile separation layer between the natural ground and the ' engineered base.
      4. Place base to the minimum thickness specified and or as indicated on the Drawings.

\*\* NOTE TO SPECIFIER \*\* Select Vegetated Base or Aggregate Base from the following paragraphs and delete the paragraphs not required. Modify base material and thickness as required for project specific conditions, loading and drainage requirements.

* + - 1. Vegetated Base:
         1. Place aggregate/topsoil engineered base thickness of:

6 inches (150 mm)

4 inches (100 mm)

2 inches (50 mm)]

\_\_\_\_\_ inches ( \_\_\_\_\_\_ mm)].

* + - * 1. Place engineered base of clear stone or crushed rock (65-70 percent), homogenously blended with topsoil (30-35 percent) and a void component generally containing air and/or water.
        2. Ensure aggregate portion of base is free from fines and has a known percentage void-space of 30 percent or greater when compacted. Particle size should range in size from 0.375 to 1.0 inch (10 to 25 mm).
        3. Add and blend topsoil before placement equal to void percentage in aggregate.
        4. Pulverized topsoil portion shall equal 30-35 percent of the total volume and be added and blended to produce a homogenous mixture prior to placement.
        5. Compact base to 95 percent minimum Standard Proctor Maximum Dry Density (SPMDD) as per ASTM D 698 as specified in Section 32 10 00 - Bases, Ballasts, and Paving.
        6. Leveling Course Preparation: Material shall be 1/4 inch chip: crushed, angular stone with a well graded distribution from 0.10 to 0.25 inch (2.5 to 6.4 mm) or a sand and fine gravel) homogenously blended with topsoil (50 percent).
        7. Install as specified in Section 32 10 00 - Bases, Ballasts, and Paving. Addition of long term fertilizer is optional.
      1. Aggregate Base:
         1. Aggregate base shall be a free-draining, crushed aggregate with a fine content less than 5 percent.
         2. Place base thickness to the specified thickness in maximum lifts of 6 inches (150 mm) compacted.
         3. Grade base and clear of large objects, such as rocks and pieces of wood.
         4. Compact base to 95 percent minimum Standard Proctor Maximum Dry Density (SPMDD) as per ASTM D 698 as specified in Section 32 10 00 - Bases, Ballasts, and Paving.
         5. Leveling Course Preparation
         6. Material shall be 1/4 inch chip: crushed, angular stone with a well graded distribution from 0.10 to 0.25 inch (2.5 to 6.4 mm).
         7. Install as specified in Section 32 10 00 - Bases, Ballasts, and Paving.
  1. INSTALLATION
     1. General: Install Ecoraster units in accordance with porous flexible paving system manufacturer's instructions.
     2. Ecoraster Bloxx System Installation
        1. Ecoraster Bloxx Units
           1. Place packaging units/layers (3 x 4 units pre-connected) with the connectors (interlocking notches) to the ground and the open cells facing up.
           2. Start laying units at one corner, preferable the lowest area, with the male connectors pointing outwards in the direction of the further area to be installed.
           3. The next layers are connected to the notches of the already installed units.
           4. To achieve a straight result, use a guideline along the outside edge.
           5. Ensure that units are installed 2 inches (50 mm) from adjacent fixed edges.
           6. Where applicable, install units with the tops (after compaction) at the same level as the adjacent hard surfaces, in particular where traffic will traverse onto the units from the adjacent area.
           7. Field cut units, preferably in place, with a circular saw, cutting disc, or jigsaw to custom fit contours and around obstructions.
           8. Install units such that they do not protrude above the specified surface elevation.
        2. Anchoring of Units
           1. Anchor units to prevent rising or lifting, for example, due to braking forces in parking areas, the units can be anchored with ground nails.
           2. Alternatively, the outer edge of the units can be lowered/angled down slightly and buried to cover the edge.
        3. Compacting Units
           1. Prior to infilling units, empty units shall be compacted with a plate tamper to help set the units into the leveling course.
        4. Concrete Infilling Units
           1. The units shall be filled with the Bloxx concrete paving units.
           2. Compact the filled units with suitable equipment.
           3. Finish in accordance with the manufacturer's instructions.
     3. Ecoraster E30, E40 and E50 System Installation
        1. Ecoraster Units
           1. Place packaging units/layers (3 x 4 units pre-connected) with the connectors (interlocking notches) to the ground and the open cells facing up.
           2. Start laying units at one corner, preferable the lowest area, with the male connectors pointing outwards in the direction of the further area to be installed.
           3. The next layers are connected to the notches of the already installed units.
           4. To achieve a straight result, use a guideline along the outside edge.
           5. Ensure that units are installed 2 inches (50 mm) from adjacent fixed edges.
           6. Where applicable, install units with the tops (after compaction) at the same level as the adjacent hard surfaces, in particular where traffic will traverse onto the units from the adjacent area.
           7. Field cut units, preferably in place, with a circular saw, cutting disc, or jigsaw to custom fit contours and around obstructions.
           8. Install units such that they do not protrude above the specified surface elevation.
        2. Anchoring of Units
           1. Anchor units to prevent rising or lifting, for example, due to braking forces in parking areas, the units can be anchored with ground nails.
           2. Alternatively, the outer edge of the units can be lowered/angled down slightly and buried to cover the edge.
        3. Compacting Units
           1. Prior to infilling units, empty units shall be compacted with a plate tamper to help set the units into the leveling course.
        4. Delineation: Prior to infilling, delineate the empty units with parking space markers where required according to the Drawings.

\*\* NOTE TO SPECIFIER \*\* Select Vegetated Base or Aggregate Base from the following paragraphs and delete the paragraphs not required.

* + - 1. Infilling Vegetated Units
         1. Units shall be filled with the specified infill aggregate.
         2. Infill shall be placed and spread evenly with suitable equipment such that the units are not disturbed beyond the specified tolerances.
         3. Units shall be slightly overfilled to allow for settlement and penetration during compaction.
         4. Compact the filled units with suitable equipment.
         5. Infill aggregate shall be fine graded by hand to ensure that: each cell is completely filled, and the infill is at or just over the top of the units for regular passenger traffic and parking.
      2. Infilling Aggregate Filled Units
         1. Units shall be filled with the specified infill aggregate.
         2. Infill shall be placed and spread evenly with suitable equipment such that the units are not disturbed beyond the specified tolerances.
         3. Units shall be slightly overfilled to allow for settlement and penetration during compaction.
         4. Compact the filled units with suitable equipment.
         5. Infill aggregate shall be fine graded by hand to ensure that: each cell is completely filled, the infill is at or just over the top of the units for regular passenger traffic and parking, or the units are overfilled by 3/8 to 3/4 in (10 to 20 mm) for heavy duty areas, for example with trucks and/or forklifts turning.
  1. MAINTENANCE
     1. Snow Removal: To ensure that the Ecoraster units are not damaged, remove snow using one of the following methods:
        1. Keep a metal edged plow blade a minimum of 1.0 inch (25 mm) above the surface during plowing operations,
        2. Use a plow blade with a flexible rubber edge or spacer pucks.
        3. Use a plow blade with skis on the lower outside corners so the plow blade does not come in contact with the units.
  2. PROTECTION
     1. Protect installed products until completion of project.
     2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION