

PART 1 GENERAL

1.1 Related Work

- .1 Section 31 05 16 – Aggregate Based Materials

1.2 Measurement for Payment

- .1 Payment will be made as noted in the Contract Unit Price Schedule, including all labour, materials, and equipment and all incidentals required to complete the installation as shown on the drawings and specified herein, including the Manufacturer's representative installation assistance.

1.3 References

- .1 ASTM D638-20, Standard Test Method for Tensile Properties of Plastics, ASTM International, West Conshohocken, PA, 2020.
- .2 ACI Committee 522. Pervious concrete, ACI522R-06 Report 2006.
- .3 ASTM C1754/1754M (2012). Standard test method for density and void content of hardened pervious concrete. ASTM C1754/1754M, International, USA.
- .4 ASTM C293/C293M-10 (2010.) Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Center-Point Loading). ASTM International, West Conshohocken.
- .5 ASTM C39/C39M (2003). Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens. ASTM International, West Conshohocken.
- .6 ASTM C666/C666M-08 (2008). Standard test method for resistance of concrete to rapid freezing and thawing ASTM C666/C666M-08. ASTM International.
- .7 ASTM International. (2017). ASTM C1701/C1701M-17: Standard test method for infiltration rate of in-place pervious concrete. ASTM International.
- .8 Current ASTM D698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort

1.4 Shop Drawings/Submittals

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate dimensions, sizes, colour, assembly, and installation details for each product specified.

1.5 Delivery and Storage of Materials

- .1 Materials and equipment shall be delivered and stored in accordance with the manufacturer's recommendations in a manner so as to prevent damage and degradation due to weather, environmental conditions, contamination by foreign matter, etc.
- .2 Deliver materials in manufacturers clearly labelled unopened containers.

1.6 Quality Assurance

- .1 All materials and products shall be new and of optimum quality.
- .2 Pre-Installation Meeting: Prior to installation of any materials, a pre-installation meeting shall be conducted to discuss the scope of work and review installation requirements. The pre-installation meeting shall be attended by all parties involved in the installation of the PurePave permeable surfacing system.
- .3 Installation shall be performed by certified contractors of PurePave and verified by emailing projects@PurePave.com.
- .4 On-site time for installation assistance by the Manufacturer's field representative shall be a minimum of 1 day with one trip. All travel and expense costs for the Manufacturer's field representative installation assistance shall be included in the Contractor's base bid price.

1.7 Inspection and Testing

- .1 The PurePave system components must be tested by an independent testing agency, hired and paid for by the Contractor, to assure compliance with:
 - .1 Subgrade compaction testing
- .2 Test reports shall be submitted by the Contractor to the Owner and Contract Administrator upon receipt.
- .3 If the installation does not comply with the tests, it is the Contractor's responsibility to remedy the work and pay for all subsequent testing necessary to achieve compliance.

1.8 Closeout Submittals

- .1 Provide maintenance data for care and cleaning of all products for incorporation into the maintenance manual specified in Section 01 78 00 - Closeout Submittals.
- .2 Contractor shall supply warrantee certificate(s) for all components, stating the warrantee start date which shall be the Owner's date of acceptance.

1.9 Warranty

- .1 The Contractor shall provide minimum warranty coverage of all components of the PurePave surface system for a period of five (5) years from the date of substantial performance as published (which may be after the completion of the PurePave installation date), including cracking, settlement, and deflection This warranty shall cover all of the PurePave system components.
- .2 The Contractor must repair all defects which occur during the five (5) year warranty period at no additional cost to the Owner and within five (5) working days of receiving notification from the Owner about the defects. Weather permitting and for defective workmanship (vandalism has material compensation for manufacturer).
- .3 Installers may also offer to renew the warranty indefinitely, with maintenance checks and cleaning every 3 years. The cost of this service is not part of this contract and may be procured by the Owner directly.

PART 2 PRODUCTS

2.1 Materials

- .1 Acceptable Manufacturer: PurePave Technologies Inc., 1505 Laperriere Ave, K1Z 7T1, Ottawa, ON, Canada. Phone: (613) 614-1868 | (613) 691-4751 | E-mail: Taylor@purepave.com | Website: www.purepave.com
- .2 Material specifications:
 - .1 PurePave uses a 2 part blend, partial plant-based polyurethane (PU) binder or single part binder, depending on use case and climate.
 - .2 Can be installed in cold temperatures (up to -10 Celsius).
 - .3 PurePave uses a wide range of aggregate types (granite, dolomite and marble) and colors (white, multi-red, grey, sunset red, and black). Refer to drawings for colour blend selected for this project.
 - .4 PurePave uses different aggregate sizes with different PU contents in the mixtures.
 - .5 PurePave uses the clear stone type 2 as a subbase.
 - .6 PurePave uses a stiff biaxial geogrid between the subbase and subgrade to ensure structural integrity.
- .3 Physical Properties:

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- .1 PU binder of PurePave has a tensile strength of 75.8 MPa and elongation of up to 209%.
 - .2 Aggregate sizes of PurePave ranges are Size 0: < 0.075 mm, Size 1: 2.36-4.75 mm, and Size 2: 4.75 mm which mix with different PU content (6-7%).
 - .3 The aggregate specific gravity is 1.6 g/cm³
 - .4 Clear stone type 2 ranges from 19-53 mm in different layers.
 - .4 Performance Characteristics:
 - .1 PurePave has a flexural strength of 6.18 MPa which is up to 6 times stronger than traditional asphalt after freeze-thaw.
 - .2 PurePave maintains its flexural strength (6.2 MPa) after 40 cycles of freeze-thaw (-40°C in a freezer followed by one hour at +35°C in a heated storage unit.
 - .3 PurePave has a high flexibility and is crack-resistant.
 - .4 PurePave does not degrade from sun oxidation, salt, vehicle weight, or water.
 - .5 PurePave has an average permeability of 3800 l/m²/hr.
 - .6 PurePave has an average porosity of 20% and infiltrates water over the entire surface.
 - .7 PurePave is resistant to ice build-up and with a permeable clear stone base, has the ability to melt snow ~ 50% faster compared to standard surfaces.
 - .8 PurePave has a ~4 times lower carbon footprint compared to asphalt.
 - .9 PurePave has the ability to infiltrate polluted stormwaters and contributes to reducing the urban heat island effect.
 - .10 PurePave is an Accessibility for Ontarians with Disabilities Act (AODA) compliant, ideal for wheelchair access.
 - .5 Granular base materials as indicated on drawings and as per Section 31 05 16 – Aggregate Base Materials.
 - .6 Surface materials as indicated on drawings.
 - .7 Biaxial Geogrid: RX 1200 by Layfield Geosynthetics or approved equivalent.

PART 3 EXECUTION

3.1 Subgrade

- .1 Set out work to lines and levels shown on Drawings. Contract Administrator to review the lines and levels prior to sub-base installation. Maintain lines and levels for duration of work.
- .2 Excavate and prepare all subgrade as shown on Drawings. Remove and dispose of existing unsuitable and excess subsoil off site.
- .3 Verify grades of subgrade for conformity with elevations and sections before placing base material.
- .4 Disturbed subgrade or fill shall be compacted to 98% SPMDD.
- .5 Place sub-base material in 75mm lifts and compact each lift to 98% SPMDD.
- .6 Contract Administrator to review subgrade and sub-base prior to placing base material.

3.2 Subdrainage

- .1 Install subdrainage to lines and levels shown on drawings.

3.3 Granular Base

- .2 Exercise caution at all times to prevent base material from becoming contaminated by soils or other deleterious materials.
- .3 Install Biaxial grid to manufacturer's instructions.
- .4 Place base material to compacted thickness as indicated on drawings.
- .5 Place in layers not exceeding 150mm compacted thickness. Compact to density not less than 98% SPMDD.
- .6 Granular base surface shall be rolled continuously, compacted and bladed as necessary.
- .7 The granular base surface shall be within 10mm of specified grade, but not uniformly high or low.
- .8 Contract Administrator to review the installed granular base. Installation of surface layer can only commence after granular base test results confirm that the specific compaction has been achieved.

- .7 Excavate and prepare all subgrade as shown on Drawings. Remove and dispose of existing unsuitable and excess subsoil off site.
- .8 Verify grades of subgrade for conformity with elevations and sections before placing base material.
- .9 Disturbed subgrade or fill shall be compacted to 98% SPMDD.
- .10 Place sub-base material in 75mm lifts and compact each lift to 98% SPMDD.
- .11 Contract Administrator to review subgrade and sub-base prior to placing base material.

3.4 PurePave Permeable Surfacing

- .1 All adjacent hard-surfaced paving work is completed before installing the porous pavement system, if applicable.
- .2 PurePave aggregate and PU binder shall be mixed on-site and installed immediately after mixing according to the manufacturer's instructions.
- .3 Apply PurePave mixture (poured in place) to the prepared base at the specified thickness in accordance with the contract drawings.
- .4 Proper surface finishing and compacting are required after installation in accordance with the manufacturer's instructions. Contractors need to use a light power trowel to finish on small surfaces and a pour in place paving unit with mobile finishing screed system to finish larger surfaces such as parking lots, kilometers of sidewalk, laneways, or road shoulders.
- .5 Allow PurePave to cure for the recommended time (12 hours) before allowing foot traffic and 24-48 hours for vehicular traffic according to the contractor's document.
- .6 Install edge restraints as per project drawings.

3.5 Post Installation

- .1 A PurePave representative shall conduct a post-installation inspection to ensure the paving has been executed correctly and to identify any potential defects or areas of concern.

3.6 Defective Work

- .1 Correct irregularities and defects which develop before PurePave system is completed. If irregularities or defects remain after completion, the entire installation may be rejected. The Contractor shall bear the entire cost to removed and replace the surface in its entirety to an acceptable standard.

3.7 Maintenance Requirements (By Owner, Not Part of This Contract)

- .1 No surfacing sealing or crack repair is required to maintain the surface, however, it is available if needed to treat a problem area, similar to asphalt.

- .2 Annual inspection by a PurePave representatives (free) is included with our research team to maintain the PurePave lifespan of 25 - 40 years and identify any need for maintenance triggers.
- .3 It is recommended to do vacuum sweeping or pressure washing every year to increase the lifespan of the PurePave permeable surfacing system.
- .4 Surface cleaning can be performed around the perimeter of PurePave surfaces that receive contributing runoff from adjacent asphalt / concrete surfaces with a ditch-witch vacuum. Standard use surfacing (with no contributing runoff) may not require any maintenance. Site characteristics must be evaluated to determine maintenance schedules for each site.
- .5 Snow Removal: Remove snow using one of the following basic procedures:
 - .1 Treat the surface like a brick paver surface. Recommended modern snow removal units or if old metal blades are used to keep a metal-edged plow blade 10mm above the surface during plowing operations.
 - .2 Use a plow blade with a flexible rubber edge, or with skids on the lower outside corners so the plow blade does not come in contact with the units.
 - .3 Approximately $\frac{1}{4}$ the standard quantity of snow melt or salt is typically required for ice melt and safety.

END OF SECTION