PART 1 - GENERAL

1.1 Scope of Work

.1 Work in this section includes all materials, equipment, and labour for play area preparation and for installation play safety surfaces, and drainage components as shown on the Contract drawings.

1.2 Related Sections

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 03 30 00.01 – Cast in Place Concrete – Short Form

.3 Section 31 00 99 12 - Earth Works for Minor Work

.4 Section 32 12 16.01 – Asphalt Pathways and Courts

1.3 References

Latest references for:

.1 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
- .2 CAN/CGSB-8.2-88, Sieves, Testing, Woven Wire, Metric.

.2 Canadian Standards Association (CSA International)
- .1 CAN/CSA B1800-15, Thermoplastic non-pressure piping compendium.

.3 Ontario Provincial Standard Specifications
- .1 OPSS MUNI 1004, Material Specification for Aggregates – Miscellaneous
- .2 OPSS MUNI 1010, Material Specification for Aggregates – Base, Subbase, Select Subgrade and Backfill Material

.4 CAN/CSA / ASTM International
- .1 ASTM C117-13, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
- .2 ASTM D4318-10e1, Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .3 ASTM C4-04(2014), Standard Specification for Clay Drain Tile and Perforated Clay Drain Tile.
- .4 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3).
- .5 CAN/CSA-Z614-14 / ASTM F1292-99, Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment including HIC, G-MAX and fall heights.

.6 ASTM F2075-15, Standard Specification for Engineered Wood Fiber for Use as a Playground Safety Surface Under and Around Playground Equipment
.7 ASTM F1951, Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.
.8 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
.9 CAN/CGSB-8.2-88, Sieves, Testing, Woven Wire, Metric.
.10 CAN/CSA-B1800-11, Plastic Non-pressure Pipe Compendium.
.11 CAN/CSA-B1800-15, Thermoplastic Non-pressure Pipe Compendium.
.12 ASTM C117-13, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
.13 ASTM D4318-10e1, Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
.14 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3).
.15 ASTM D 3034-14 Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings

1.4 Submittals

.1 Product data: submit product data in accordance with Section 01 33 00 - Submittal Procedures.
.1 Submit manufacturer's instructions, printed product literature and data sheets for all equipment and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Samples: submit samples in accordance with Section 01 33 00 - Submittal Procedures.
.1 Submit samples of sand.
.2 Submit samples of Engineered Wood Fibre.

1.5 Testing and Inspections

.1 Independent Inspection/Testing Agencies approved by the Owner’s Representative, will be engaged by the Owner for the purpose of inspecting and/or testing portions of Work.
.1 Inspections/Testing to be sufficient for complete coverage of Work.
.2 Cost of such services will be borne by the Owner.

.3 If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by the Consultant and/or Owner's Representative at no cost to the Owner. Pay costs for retesting and reinspection

.2 Testing and Inspections (Engineered Wood Fibre)

.1 Subgrade and granular subbases and bases to be inspected by a geotechnical Engineer and an Inspection Report issued to and approved by the Contract Administrator, before subsequent steps are undertaken.

.2 The Contract Administrator may require additional field and/or laboratory tests of the materials during installation to ensure that the materials are satisfactory. This shall be carried out at no extra cost to the contract.

.3 Certificates of laboratory testing to ASTM F1292, ASTM F2075 and ASTM F1951 as part of the qualification of the wood fibre.

.4 Subgrade and granular bases to be inspected by a geotechnical Engineer and an Inspection Report issued to the Contract Administrator, before subsequent steps are undertaken.

.5 Notify the appropriate agency and Consultant 48 hours in advance of the requirement for tests, in order that attendance arrangements can be made.

1.6 Substitutions

.1 Alternative products will not be accepted without approval of the Consultant and Owner. Alternatives, with prices, must be identified within the tender bid. Alternatives to match specified in size, materials, and thickness.

1.7 Coordination

.1 Layout and installation of safety surfacing to be coordinated with installation of play structures.

.2 Coordination to be done through the shop drawing process for installation and verified required dimensions are met.

1.8 Utility Lines

.1 Before commencing work, it is the contractor's responsibility to establish locations and extent of underground utility lines in area of excavation. Notify the Consultant and/or Owner's Representative of findings.

.2 The location of utility lines will be at the cost of the contractor by means of private underground service locating company as required. Any damage to existing utility lines will be at the cost of the contractor.

.3 Known underground and surface utility lines are indicated on drawings. No guarantee is given of completeness or accuracy.

.4 Make good and pay for damage to existing utility lines resulting from work.

.5 Indicate all located utilities lines and/or services on record drawings.

1.9 Protection.

.1 Provide adequate protection around bench markers, layout markers, survey markers and geodetic monuments.

.2 Provide protection to ensure no damage to existing facilities and equipment situated on site.

.3 Effect approved measures to minimize dust as result of this work.

1.10 Delivery, Storage and Handling

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect equipment from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

.4 Stockpile fill materials designated by the Consultant and / or Owner. Stockpile granular materials in manner to prevent segregation.

.5 Protect fill materials from contamination.

.6 Do not stockpile excavated material to interfere with site operation or drainage.

1.11 Waste Management and Disposal

.1 Separate waste materials for reuse and recycling in accordance with project Waste Management Plan.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Separate for reuse and recycling and place in designated containers Steel, Metal, Plastic waste in accordance with Waste Management Plan.

.5 Fold up metal banding, flatten and place in designated area for recycling.

1.12 Payment

.1 Installation of play equipment and safety surfacing (including base and ramps, edging) to be certified prior to payment for safety surfacing and ramps, edging.

.2 If installation of play structures holds up certification, payment may proceed after approval by Consultant.

PART 2 - MATERIALS

2.1 Play Area Safety Surfacing

.1 Granular Materials - drainage backfill.
- .1 Clear Granular Fill – 13-19mm (1/2 to 3/4”) clear, clean washed, stone to OPSS MUNI 1004.
- .2 Granular ‘A’ to OPSS 1010.

.2 Sub drain
- .1 100mmø flexible perforated PVC | HDPE pipe with sock and end cap.
- .2 100mmø rigid PVC pipe - use 1 metre before connection to ‘T’ and for connection to catch basin/landscape drain.
- .3 'T' Connection.
- .4 Rodent guard at all drain outlets.
- .5 To the requirements of OPSS 1840 and 1841 and CGSD41-GP29M.

.3 Resilient Fall Surface for Play Areas - Engineered Wood Fiber (EWF).
- .1 The materials shall consist clean engineered material. Standard wood chips are not acceptable.
- .2 Materials must meet or exceed ASTM F1292-13, and ASTM F2075-15 for impact attenuation.
- .3 Materials must comply with ASTM F1951.
- .4 Materials must provide a minimum 5-year warranty against loss of resiliency.
- .5 Free from subsoil, roots, vegetation debris, toxic materials and stones.
- .6 Approved material

.1 Cedar Weave Resilient fall surface for play areas, as supplied by Playground Planners, 613-828-5502.
.2 Fiberweave as supplied by Fibertop, 905-203-0816.
.3 Approved equivalent.
.4 Provide test results.

.4 Filter Cloth
.1 Nonwoven Class 1 geotextile, Amoco 4550 or equivalent.

PART 3 - EXECUTION

3.1 Coordination

.1 Contractor must coordinate with the equipment installers during and or after drainage layer installation for onsite layout verification and prior to proceeding with installation of play safety surface for play equipment inspections.

.2 Provide date of installation to to the Contract Administrator a minimum of 2 business days prior to installation.

.3 Verify safety surface dimensions with playground supplier / installer.
.1 Notify Consultant of any discrepancies prior to proceeding.

.4 Coordinate installation of Asphalt Ramp for Play Areas ensuring accessible slope and adequate safety surface dimensions are maintained.

.5 Refer to Section 32 12 16.01 – Asphalt Pathways and Courts.

3.2 Layout and Excavation

.1 Subgrade, granular subbases and bases to be inspected by a geotechnical engineer and authorization given by the Contract Administrator prior to subsequent steps being undertaken.

.2 Stake out the play / sand area perimeter and the location, and alignment of all drain tiles for inspection by the Contract Administrator. Ensure required safety zones are maintained.
.1 Ensure safety dimensions are met where full depth of EWF layer occurs.

.3 Verify all underground utilities and dimensions in the field and immediately report all discrepancies or findings to the Contract Administrator.

.4 Excavate to Section 31 00 99 12 Earth Works for Minor Work.

.5 Play area to be excavated to accommodate a minimum of 450 mm of safety surface/clear stone (unless otherwise indicated) and 600mm maximum depth at weeping tile.

.6 Sand play area to be excavated to accommodate sand and clear granular layer as per contract details.

3.3 Subgrade

.1 Fine grade sub-grade of play area eliminating uneven areas and filling low spots and sloping to ensure positive drainage to the drain tile trenches. Remove all debris. Sub- excavate soft and unstable areas in sub-grade and backfill with approved fill and compact.

.2 Compact finished sub-grade to 95% Standard Proctor Maximum Dry Density.

.3 Ensure subgrade preparation conforms to levels and compaction required, to allow for installation of granular base. Testing in accordance with Section 31 00 99 12 Earth Works For Minor Work.

3.4 Subdrain Installation

.1 Trench to a minimum width of 150mm and to the depth indicated on the contract drawings.

.2 Excavate to the specified depth and true to line and level, to ensure a constant even slope as shown on drawings.

.3 Level and compact bottom of trench to be free of high spots and depressions. Fill over excavated area of trench with granular A and compact to 95% Standard Proctor Maximum Dry Density.

.4 Install perforated tile drains with filter sock and non-perforated rigid tile drains in the clear crushed stone drainage course as shown on the contract drawings. Depth of trench varies with a minimum 150mm depth as indicated on the drawings. Wrap trench including stone and tile drain with geotextile. Slope play area subgrade 2% to tile drains trench.

.5 Install non-perforated, rigid HDPE lead and connections to catchbasins, landscape drains or swale as shown on the Contract Drawings and with a positive slope as shown on drawings. Backfill trench with 150mm Granular 'A' compacted to 95% Standard Proctor Maximum Dry Density and extend throughout excavated area as shown on Contract Drawings.

.6 Lay pipe true to line and level and in accordance with manufacturer's recommendations and best trade practice and in such a manner that it is full contact with the clear stone along its entire length.

.7 Keep excavations free of water and protect against the action of surface water at all times.

3.5 Drainage Layer

.1 Drainage Layer: Verify on site and have it approved prior to proceeding
- .1 Top up drainage layer when required to conform to:
  - .1 100mm (4") at edge to 150mm (6") centrally of play area
  - .2 Clear Granular Fill – 19mm (3/4").
- .2 Top elevation of drainage layer true and level.
- .3 Verify to ensure a true and level elevation with a constant measurement of 550mm (22") from the top of the drainage layer to the top of the asphalt edge elevation.

3.6 Geotextile

.1 Filter Fabric
- .1 Cut and fit filter fabric around playground structures footing and overlap seams by 300mm. Tack filter fabric to asphalt edge with adhesive (PL Premium or approved equal).
- .2 Install: Nonwoven filter fabric with 600mm (24") lapping on all sides.
- .3 Staple or spike filter fabric to bottom of asphalt lip.

3.7 Resilient Fall Surfacing (Engineered Wood Fibre or EWF)

.1 Material to be pre-approved prior to installation.

.2 Inspection and approval by the Contract Administrator to be obtained of installation of play equipment prior to proceeding.

.3 Contractor must prepare the site to accept the resilient surfacing material.

.4 Contractor must co-ordinate the supply & delivery of the resilient surfacing material.

.5 The material must be installed in an orderly fashion ensuring the proper depth is achieved.

.6 Install 150mm lifts and compact each lift. Compaction to meet ASTM F1951.
- .1 Rake, level and wet the surface before compacting with a mechanical compactor after each layer installed.
- .2 Change direction 90 degrees between each layer. Repeat these steps until the required compacted depth has been reached.
- .3 Remove all foreign material.

.7 Final compacted EWF must be level with asphalt lip, or as indicated where adjacent to concrete edger.

.8 The contractor must allow for additional installation of the material due to minor settling, 1 (one) week after the initial installation of the material.

.9 The Contractor must clean the area affected, once the installation is complete.

.10 The Contractor must protect the existing elements and make good any areas affected.

.11 Do NOT stock pile resilient surfacing material in landscaped area.

.12 Contractor shall confirm engineered wood fibre meets or exceeds current Annex H and ASTM F1951.

3.8 Field Quality Control

.1 Inspection and testing of Playground Surfacing: carried out by Playground Inspector approved by the Contract Administrator.

.2 Contractor to top up/amend surfacing found inadequate by inspector. Costs of tests: paid by Contractor.

.3 Inspection and testing will include both play equipment installation and play area surround installation.
- .1 Inspection report to include; general site information, surfacing information (min. 3 test pits, etc.), general equipment information, hazard and compliance rating, Annex H compliance analysis, qualifications / certificates, proof of insurance. Report to be reviewed by City of Ottawa and meet standard practises.
- .2 A certified playground inspector is to inspect the completed playground before the playground installer leaves the site.

.4 Contractor to co-ordinate the site work execution and completion with the installation of the play structure & inform the Owner's Representative of any changes in the schedule.

3.9 Cleaning

.1 Progress Cleaning:
- .1 Leave Work area clean at end of each day.
- .2 Clean up areas where EWF has been spilled outside of play areas.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.10 Protection After Completion

.1 Protect and maintain installation including accessories, until acceptance of project work.

.2 Immediately remove from site, damaged materials and accessories. Replace repair, refinish or otherwise make good to approval of Consultant.

END OF SECTION