SECTION 33 44 16 – utility trench drains

1. General
   1. Summary
      1. This Section includes requirements for design, supply and installation of metal trench grating system consisting of, but not limited to the following:
         1. Linear trench drains.
         2. Sealant at connection points.
         3. Support system, fasteners, and accessories required for a complete installation of the metal grating system.
      2. Related Requirements:
         1. Section 03 30 00 – Cast-In-Place Concrete.
         2. Section 03 35 00 – Concrete Finishing.
         3. Section 07 16 16 – Crystalline Waterproofing.
   2. Submittals
      1. Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.
      2. Product Data: Manufacturer's data sheets on each product to be used, including:
         1. Preparation instructions and recommendations.
         2. Catalog information, component sizes, rough-in requirements, service sizes, and finishes.
         3. Storage and handling requirements and recommendations.
         4. Installation methods.
      3. Shop Drawings:
         1. Furnish complete shop drawings required for the work of this Section to the Consultant for review prior to fabrication.
         2. Co-ordinate shop drawings for work of this Section with those for other trades to ensure correct interface details required to provide watertight installation.
         3. Shop drawings shall incorporate plans, elevations, sections, and details for all work in this Section. The details shall show and specify all materials, thicknesses, types and finishes, areas to be sealed and sealant materials, type of construction including joinery and fasteners, all anchorage assemblies and components, the fabrication and erection tolerances for the work in this Section and the adjoining related work of other Sections.
      4. Verification Samples: Submit 305 mm (12") long samples of each product specified, representing actual product, colour, and patterns.
      5. Maintenance: On completion of work of this Section, supply maintenance and cleaning instructions for insertion into the Operating and Maintenance Manual.
   3. ADMINISTRATIVE REQUIREMENTS
      1. Pre-installation Conference: Conduct conference at the Project site, in accordance with Section 01 31 19 – Project Meetings.
         1. Convene one week prior to commencing Work of this Section.
         2. Require attendance of installation material manufacturer, plumber, waterproofing installer, tile installer and installers of related work. Review installation procedures and coordination required with related work.
         3. Meeting agenda includes but is not limited to:
            1. Drain location and orientation.
            2. Substrate requirement.
            3. Edge protection, transition, and pre-fabricated movement joint profiles.
            4. Waterproofing techniques.
            5. Crack isolation techniques.
   4. QUALITY ASSURANCE
      1. Manufacturer Qualifications: Minimum 5-year experience manufacturing similar products.
      2. Source Limitations for Materials and Accessories: Obtain product of a uniform quality for each application condition from a single manufacturer.
   5. MOCK-UPS
      1. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
         1. Finish areas designated by Consultant.
         2. Do not proceed with remaining work until workmanship is approved by Consultant.
         3. Rebuild mock-up area as required to produce acceptable work.
   6. DELIVERY, STORAGE, AND HANDLING
      1. Store products in manufacturer's unopened packaging until ready for installation.
      2. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
      3. Store materials in a dry, warm, ventilated weathertight location.
      4. Handle materials to avoid damage.
   7. 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 recommended limits.
   8. SEQUENCING
      1. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
   9. WARRANTY
      1. Warranty: Provide manufacturer's standard warranty for defects in materials or workmanship for two (2) years from date of purchase.
2. Products
   1. manufacturers
      1. Basis-of-Design products are named in this Section; additional manufacturers offering similar utility trench drains may be incorporated into the work provided they meet the performance requirements established by the named products.
      2. Acceptable Materials Manufacturers: Subject to compliance with requirements specified in this Section and as established by the Basis of Design Materials, manufacturers offering products that may be incorporated into the Work include but are not limited to, the following:
         1. Mea Drain Supreme Supplied by Northstar Industries 1-877-385-5130, http://northstarindustries.ca/
   2. DESIGN REQUIREMENTS
      1. Trench drain systems shall employ a sloped grade on both sides of a linear trench to move runoff into a point along the channel. Liquids shall be discharged by gravity flow at the outlet points of the drain into an underground pipe system or culvert.
      2. Lengths and arrangements indicated on Contract Drawings.
      3. Designed to accept frequent vehicular, forklift, and bus wheel loads.
      4. Each unit will feature a full radius in the trench bottom, step system slope and a male to female interconnecting end profile.
   3. CHANNEL
      1. The channel system bodies shall be manufactured from polymer concrete with minimum properties as follows:
         1. Compressive Ttrength: 90 N m/m²
         2. Flexural Strength: 22 N/mm²
         3. Water Absorption: 0.05%
         4. Water Penetration Level: 0 mm
         5. Density: 2.23 kg/dm³
         6. Material Structure: Capillary free
      2. Polymer concrete channel systems with cast iron galvanized finish edge rails:
         1. Drain channel used in areas requiring minimal water flow: 100 mm internal width trench system.
            1. Basis of Design Materials: EN1000 Trench Drain System by Northstar Industries.
         2. Drain channel used where slab height restrictions are an issue: 150 mm internal width trench system.
            1. Basis of Design Materials: EN1500 Trench Drain System by Northstar Industries.
         3. Drain channel used in Truck / Bus areas: 200 mm internal width trench system.
            1. Basis of Design Materials: EN2000 Trench Drain System by Northstar Industries.
         4. Drain channel used in Wash Bay areas requiring higher hydraulic flow rates: 300 mm internal width trench system.
            1. Basis of Design Materials: EN3000 Trench Drain System by Northstar Industries.
      3. The rail system will be cast in by the manufacturer to ensure maximum strength between polymer concrete body and edge rail so there is no void.
         1. Cast iron rail will have a galvanized finish.
      4. End caps, outlet connections and all parts shall be polymer concrete with cast iron edge rail.
      5. Joint sealant: As recommended by manufacturer.
      6. Clean out shovel to be provided to match contour of trench drain.
   4. GRATING
      1. Heavy duty hot dipped galvanized slotted ductile iron grate for truck and hard wheel forklift traffic.
      2. Ductile iron profile grate to be 135,000 lb. load rated according to the EN1433 with system rating.
      3. Grate to have non-bolted Profix stainless steel locking system.
      4. Grates Length: 500 mm.
   5. CATCH BASIN
      1. Catch Basin: Deep system of polymer concrete with integrated cast iron rail, pre-formed knockout for connections.
         1. Basis of Design Materials:
            1. EN1000.SK by Northstar Industries, when used with EN1000 channel system.
            2. EN1500.SK by Northstar Industries when used with EN1500 channel system.
            3. EN2000.SK by Northstar Industries when used with EN2000 channel system.
            4. EN3000.SK by Northstar Industries when used with EN3000 channel system.
      2. Catch basin shall be 610mm x 610mm x 914mm deep, with H20 rated mesh grating. Saddles to be installed by manufacturer if used with trench drain system. Outlet location to be determined by contractor.
      3. Catch basin to have same HDG ductile iron slotted grating as channel system.
      4. Catch basin to include galvanized sediment bucket for cleanout.
   6. ACCESSORIES
      1. Joint and Connection Sealant:
         1. Adhesive: Excel: One-part, modified polyurethane permanently elastic, adhesive/sealant, based on MS Polymer, for indoor and outdoor applications:
            1. Tensile strength 2.6 MPa / 380 Psi.
            2. Uses: Sold as integral part of the inside and outside corner attachments, channel connections and endcap and outlet connections.
            3. All joints must be sealed progressively during the installation.
      2. Channel Supports:
         1. Supports are used at every channel section connection and beginning and end of runs to support the channels on vertical rebar supports.
         2. Use fastening screws at each channel location and for each supporting rebar.
         3. Align channels lengthwise and adjust height of the channels to be below the adjoining surfaces by 3-5 mm.
3. Execution
   1. examination
      1. Examine substrates and conditions under which this work is to be performed and notify Consultant in writing, of conditions detrimental to the proper completion of the Work.
      2. Do not proceed with work until unsatisfactory conditions are corrected and until substrates have been properly prepared.
      3. Beginning of installation will be construed as Installer accepting substrates and conditions.
      4. Verify drain location and compatibility with drain system specified.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces by removing all debris, sharp edges and protrusions that could damage the integrity of the system.
      3. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the Project conditions.
   3. INSTALLATION
      1. Install trench drains in strict compliance with manufacturer's instructions, recommendations, and approved details.
      2. Coordinate with installation of other components specified, and with setting materials for floor finishes.
      3. Brace channel bodies against compression by outside lateral forces during the concrete pour using wood or the channel grates.
   4. CLEANING
      1. Clean exposed surfaces using manufacturer recommended materials and methods.
      2. Remove and replace work which is damaged, or which cannot be successfully cleaned.
      3. Test all drain systems to verify compliance with specified requirements.
   5. PROTECTION
      1. Protect installed products until completion of Project.
      2. Touch-up, repair or replace damaged products prior to Substantial Completion.

END OF SECTION