

PART 1 - GENERAL

1.1 Work Included

- .1 This section specifies requirements for supply and installation of granite curbstone.

1.2 Reference Standards

The latest editions of all the following references shall apply to this specification.

- .1 CSA B651-18, Accessible Design for the Built Environment.
- .2 Nova Scotia Department of Transportation and Active Transit – Highway Construction and Maintenance Standard Specification.

1.1 Related Sections

- .1 From Joint Committee on Contract Documents Standard Specification for Municipal Services, latest edition:
- | | |
|----------------------------|------------------|
| 1. Earthwork | Section 31 20 00 |
| 2. Asphalt Concrete Paving | Section 32 12 16 |
| 3. Reinstatement | Section 32 98 00 |
| 4. Standard Details | Section 39 00 00 |
- .2 Concrete Section S-11/A
- .3 Walks, Curbs and Gutters Section S-11/B
- .4 Interlocking Concrete Pavers Section S-12

1.2 Submittals

- .1 If not included in the Contractor's QMP submission, the Contractor shall submit a supplementary QMP to the Engineer for review and approval for projects including granite curbstone. The supplementary QMP shall be prepared to fit the criteria of the unique project.

This supplementary QMP shall be submitted to the Engineer succeeding project award and prior to construction, as part of the required preconstruction documents identified in HRM Construction's Contractor Required Pre Construction Information

list. HRM will provide written approval (QMP Approval Letter) of the supplementary QMP in a timely manner.

If the Engineer deems the supplementary QMP unacceptable, the Contractor shall provide iterations in a timely manner until the QMP is considered adequate by the Engineer. Construction shall not commence without submission of the Contractor's QMP Approval Letter for the project.

Note, if deemed necessary by the Contractor, an amended QMP can be submitted to the Engineer for review and approval throughout the construction season.

An outline for a QMP, based on ISO 10005, is provided for reference in Attachment A.

- .2 If specified in Project Documentation, submit shop drawings indicating layout and relationship of granite curbstone to sidewalk paving joints, fixtures and project formed details. Note, Project Documentation may request additional details than referenced above.
- .3 Submit full size samples of granite curbstone units to indicate color, and surface texture selection to the Engineer for review and approval at pre-construction meeting.
- .4 Submit the manufacturer's product data relating to granite curbstones.

1.3 Mock-up

- .1 A job site mock-up should always be performed to ensure that the product or system conforms to the aesthetic, that material coverage rates are known, and method of workmanship are understood.

1.4 Quality Assurance

- .1 The contractor shall be qualified in the field of hardscape or stone masonry with a successful track record. The contractor should have qualified personnel that are trained in installation of granite curbstone or direct oversight of binder suppliers' representative.
- .2 Install materials in accordance with all environmental conditions by the manufacturer and safety conditions set forth or as modified by the applicable rules and regulations of the local, provincial, and federal authorities having jurisdiction. Consult safety data sheets for handling recommendations.

1.5 Delivery, Storage, and Handling

- .3 Deliver concrete pavers to the site in steel banded, plastic banded or plastic wrapped cubes capable of transfer lift or clamp lift. Unload pavers at job site in such a manner that no damage occurs to the product.
- .1 Deliver granite curbstones to site in steel banded, plastic banded or plastic wrapped cubes cable of transfer lift or clamp lift with the manufacturers' name, labels, product identification and batch numbers. Unload curbstones at job site in such a manner that no damage occurs to the product. Damaged material must be documented, reported to the Engineer and removed from site.
- .2 Any piece of granite showing flaws, damage or imperfections upon receipt at the storage yard or jobsite, shall be referred to the Engineer for decision as to whether it shall be rejected, patched, or redressed for use. If rejected, the Contractor shall replace curbstones at no additional charge to the Owner.
- .3 Store all materials off the ground and avoid excessive heat, or freezing temperatures until ready to use.

1.6 Environmental Conditions

- .1 The base needs to be prepared according to the expected traffic loads. Base must be water permeable. Future loads must not cause the surface to settle or loosen stone.
- .2 Do not install curbstones over frozen base materials.
- .3 Protection, including security, if necessary, to prevent damage to newly installed curbstones shall be provided at Contractor's expense.

PART 2 - PRODUCTS

2.1 Materials

- .1 **Granite:** 'Stansted Grey' granite from the Polycor quarry in Rivière-à-Pierre, Quebec, Canada (1-800-463-2229) or approved equivalent. The granite must be sound, homogeneous, free of visible defects and cracks, and compliant with the following requirements:
 - .1 Compressive strength: 168.4 MPa, dry and perpendicular to the grain.
 - .2 Modulus of rupture: 11.7 MPa, dry and perpendicular to the

grain.

- .3 Water absorption: 0.18%.
- .4 Bulk mass: 2,705 kg/cubic meter.
- .2 **Crushed stone:** Type 1 gravel as per the Standard Specification for Municipal Services, Earthwork, Section 31 20 00 and approved by the Engineer.
- .3 **Concrete:** Compliant with the Section S-11/A

2.2 Curbstone Fabrication:

- .1 Curbstones to form sections with straight and chip-free angles, compliant with the following requirements:
 - .2 Thickness: 150 mm
 - .3 Height: 450mm
 - .4 Length: Min 1000mm
 - .5 C/W Radius Chamfer: 13mm
- .2 Fabrication Tolerances
 - .1 Height: : $\pm 15\text{mm}$
 - .2 Width: $\pm 10\text{mm}$
 - .3 Projection of visible rock faces: +12%, -6% of the height.
 - .4 Joint squareness: $90^\circ, \pm 1.5^\circ$.
- .3 Finishes
 - .1 Top & bottom: Sawn
 - .2 Front & Rear: Splitface
 - .3 Extremities: Sawn with clearance at the bottom
- .4 Curves
 - .1 Furnish and shape curved curbstones according to radius and arcs on the drawings
- .5 Other curb elements:

- .1 Furnish all special sections required to complete the project (transitions, low profile curbs, nosings), with quality and finishes similar to standard curbs.

PART 3- EXECUTION

3.1 Subgrade

- .1 The subgrade must comply with the layouts, profiles and levels indicated on the drawings and be approved by the Engineer.
- .2 The subgrade must be well drained and compacted at 100% Standard Proctor maximum dry density before beginning installation.

3.2 Crushed Stone Bed

- .1 Lay on foundation a 300 mm thick bed of Type 1 gravel and compact it to a density of 95%.

3.3 Granite Curb

- .1 Mark location of curb and place in field for review by Engineer prior to setting granite
- .2 Each curbstone is to be laid to rest on two concrete brick or two granite spacers. The spacers will facilitate the levelling of the curbstone and leave the empty space under the curbstone that must be filled with concrete later.
- .3 Granite elevations shall not deviate by more than 6 mm from the finished layout, profiles and elevations shown on the drawings.
- .4 Curbstones shall be maneuvered with enough care to prevent damage to ends.
- .5 Install curb sections with extremities as close together as possible. Do not use mortar to fill between each curbstone section.

3.4 Concrete Bed

- .1 Place 10M rebar longitudinally for concrete bed and asphalt impregnated fiberboard shown on the drawings.
- .2 Install proper formwork to hold concrete to dimensions shown on the drawings.
- .3 After placing the curbstones and rebar and installing formwork, pour a bed of concrete at a minim rate of 1 cubic meter per 10

lineal meters. The concrete must be poured under and on both sides of the curbstones as shown on the drawings.

- .4 Reinstall the roadway gravels, asphalt and sidewalk as shown elsewhere on the drawings.

3.5 Protection

- .1 Let the concrete harden at least 48 hours before proceeding with any adjacent landscaping work.

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