

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 02 41 99 – Selective Demolition.

1.2 REFERENCES

- .1 Province of Ontario
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990, c.0.1, as amended and O.Reg. 213/91 as amended – Updated January 1, 2016.
 - .2 Infrastructure Health and Safety Association (IHSA)
 - .1 Hoisting and Rigging Safety Manual.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Conduct a pre-dismantling meeting with Departmental Representative to verify project requirements, equipment, procedures and assigned storage areas in accordance with Section 01 00 10 – General Instructions.
- .2 Sequencing.
 - .1 Coordinate work of this Section with dismantling work of Section 02 41 99 – Selective Demolition.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 00 10 – General Instructions.
- .2 Site Quality Control Submittals:
 - .1 Submit stone dismantling plan for review.
 - .2 Submit storage and identification system for review.
 - .3 Provide up-to-date copies of stone location recording system chart when requested.

1.5 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for incorporation into manual specified in Section 01 00 10 – General Instructions. Include:
 - .1 Photographically record stonework to be dismantled and rebuilt.

1.6 QUALITY ASSURANCE

- .1 Quality assurance in accordance with Section 01 00 10 – General Instructions.
- .2 Qualifications:
 - .1 Masonry Contractor:

- .1 Work of this Section: executed by experienced contractor specializing in historic stone dismantling.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 00 10 – General Instructions.
- .2 Protect and store stones to facilitate their re-installation.
 - .1 Store dismantled masonry units on wood platforms protected from exposure to water, elements, and potential mechanical damage fully covered under polyethylene.
 - .2 Store and protect stones salvaged for re-installation in location indicated on site plan.
- .3 Label salvaged stones using identification system as indicated in Part 3 Article – Identification System below.
- .4 Handle granite stone slabs and steps for salvage as specified. Prevent damage or loss of stone.
- .5 Packaging Waste Management:
 - .1 Remove for reuse and recycling pallets, crates, padding, and packaging materials in accordance with Section 01 00 10 – General Instructions.

1.8 AMBIENT CONDITIONS

- .1 Loosen wet masonry only when temperature is above 5 degrees C.
- .2 In temperature 5 degrees C and below:
 - .1 Keep stones dry.
 - .2 Protect wet stones from freezing.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine masonry, staging and storage areas and notify Departmental Representative in writing of conditions detrimental to acceptable and timely completion of Work.

3.2 SITE VERIFICATION OF CONDITIONS

- .1 Report in writing, to Departmental Representative areas of deteriorated stone not identified in the documents. Obtain Departmental Representative's approval and instructions for repair of stone before proceeding.
- .2 Stop work in that area and report to Departmental Representative immediately evidence of hazardous materials.

3.3 PREPARATION

- .1 Remove deteriorated portions of stones using low impact removal methods until sound surface is reached.
- .2 Obtain Departmental Representative's approval for alternative methodology and tools to be employed before commencing the work.
- .3 Clean stone surface of debris.

3.4 PROTECTION

- .1 Prevent damage to building, bronze railings remaining in place, flagpoles and bases, lamp standards, fencing, trees, landscaping, natural features, bench marks, pavement and utility lines which are to remain. Make good damage incurred.
- .2 Protect surrounding components from damage during work.
- .3 Make good damage to historic fabric.
- .4 Obtain Departmental Representative's approval for repair methodology.

3.5 IDENTIFICATION SYSTEM

- .1 Number and identify stones and bronze railing elements on a photographic record.
- .2 Before dismantling stones, record dimensions of each numbered stone in removal area on a drawing.
- .3 Temporary Marking and Recording:
 - .1 Mark stone, on face, before removal using marking product which can be completely erased when required without damaging masonry unit:
 - .1 Ball-point pen on diachylon, attached to stone.
 - .2 Waxless chalk directly on stone.
 - .2 Track relocated stones and other masonry units:
 - .1 Use numbering, marking, and positioning system.
 - .3 Mark/Identify:
 - .1 Stones and other elements or components to show identity and position.
 - .2 Location from which stones are removed on drawings.
 - .4 Ensure that temporary marking will remain in use, resistant to weather, handling and cleaning until final marking of stones.
 - .5 Remove markings and adhesive without damaging units:

- .1 Brush with vegetable fibre brush: either dry or with water.
- .2 Use no solvent, acid or other chemical product

3.6 TEMPORARY SHORING SUPPORT

- .1 Construct shoring and cradling, and other temporary framing work needed to support structure, or parts of it, during removal operations and in anticipation of re-installation procedures, as may be required, and in accordance with provincial legislation.

3.7 METHOD FOR LOOSENING STONES

- .1 Use approved methods to loosen stones which will cause no damage either to stones or to other architectural elements.
- .2 Use hand tools only.
- .3 Remove mortar without chipping, altering or damaging masonry units.
- .4 Obtain Departmental Representative's approval for use of power tools before commencing work.

3.8 STONE REMOVAL

- .1 Remove loose material from stones.
- .2 Clean dust, mortar, debris and fragments from area of work.

3.9 RAKING JOINTS

- .1 Use manual raking tool to obtain clean masonry surfaces.
 - .1 Remove deteriorated and adhered mortar from masonry surfaces.
 - .2 Clean out voids and cavities encountered
- .2 Remove mortar without chipping, altering or damaging masonry units.
- .3 Clean surfaces of joints with non-ferrous brush and compressed air without damaging texture of exposed joints or masonry units.

3.10 DISMANTLING AND MOVING STONES

- .1 Avoid damaging arrises of stone when removing mortar and freeing up.
- .2 Remove mortar using hand tools.
- .3 Use wood wedges where required to remove or dislocate stone.
 - .1 Use flat pry bars protected with impact absorbing protection (burlap, cardboard).
- .4 Use hoisting and rigging methods and materials in accordance with IHSA recommendations and the Occupational Health and Safety Act.
- .5 Protect stone from damage when hoisting and lifting from position.
 - .1 Use separators or wood shims to isolate units from hoisting belts.

- .6 Where damage occurs to stone:
 - .1 Report damage to Departmental Representative.
 - .2 Repair stone in accordance with Departmental Representative's instructions.
 - .3 Make good damage incurred at no additional cost to Contract.
 - .4 Obtain review and approval of repaired damage by Departmental Representative.

3.11 HANDLING

- .1 Usage of Lewis bolts for handling stone is not permitted.
- .2 Place detached stones on wood surfaces during handling. Prevent contact with metal.
- .3 When stones are lowered to ground, place directly on wooden platform used for transport or storage.
- .4 Transport and keep stones on wooden platforms.
- .5 Ensure that sharp edges of stones do not come into contact with hard objects.

3.12 TEMPORARY STORAGE STAGING AREA

- .1 Place stones in designated area of site for cleaning, detailed inspection and for final marking, before storage.
- .2 Prevent absorption of ground water and water accumulation on stone. Rest stones on their natural bedding during storage.
- .3 Make stones accessible and retrievable when required.

3.13 CLEANING

- .1 Do cleaning operations at above freezing temperature.
 - .1 After cleaning, protect wet stones against freezing until dry.
- .2 Clean stones by wet scrubbing with vegetable fibre brush unless otherwise instructed by Departmental Representative.
 - .1 Do not use high pressure water jet.

3.14 FINAL MARKING

- .1 Do final marking after cleaning, on surface that supports good adhesion and legibility and will not be visible after resetting.
- .2 Do marking in colour. Dimensions: legible from minimum distance of 2 metres.
- .3 Ensure that marking product used will not affect mortar to stone adhesion when resetting.
- .4 Ensure marking product used will survive storage until resetting of stone.

3.15 STORAGE

- .1 Lay out storage so that each stone will have its numbered face visible, and be accessible or removable.

END OF SECTION

Part 1 General

1.1 DEPARTMENTAL REPRESENTATIVE-SUPPLIED PRODUCT

- .1 Existing granite masonry for re-installation at West Upper Landing and Stairs located in Departmental Representative's storage yard on site.
 - .1 Coordinate access for re-installation with Departmental Representative.

1.2 RELATED REQUIREMENTS

- .1 Section 07 92 00 – Joint Sealants.

1.3 REFERENCES

- .1 Definitions:
 - .1 Lewis: instrument inserted at top of stone as means of attachment in raising and lowering. Holds stone by means of keys or wedges fitted to dovetailed recess.
 - .2 Dogs: metal appliance for securing parts or members together by means of one or more projecting teeth or bent portions, lug, cramp.
- .2 Reference Standards:
 - .1 CSA International
 - .1 CAN/CSA A370-14, Connectors for Masonry.
 - .2 CAN/CSA A371-14, Masonry Construction for Buildings.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-installation Meetings: in accordance with 01 00 10 – General Instructions, convene pre-installation meeting one week prior to beginning re-installation.
 - .1 Ensure key personnel, site supervisor, Departmental Representative, speciality contractor attend.
 - .1 Verify project requirements.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 00 10 – General Instructions.
- .2 Samples:
 - .1 Submit two samples of each type of masonry anchor.

1.6 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for masonry work for incorporation into manual specified in Section 01 00 10 – General Instructions.

1.7 QUALITY ASSURANCE

- .1 Qualifications:

- .1 Execute work by personnel experienced in re-installation of period stone masonry.
- .2 Mock-ups:
 - .1 Construct mock-up in accordance with Section 01 00 10 – General Instructions.
 - .2 Perform mock-up of one granite masonry step to demonstrate re-installation procedure for granite masonry steps on custom sized and adjusted pedestals and filter fabric wrapped stone pea gravel mounds to achieve required slope at stone step's surface. Include masonry anchor with pin at joint with adjacent stone step.
 - .3 Notify Departmental Representative minimum of 24 hours prior to construction of mock-up.
 - .4 Perform mock-up under supervision of Departmental Representative to demonstrate a full understanding of specified procedures and techniques is achieved before work commences.
 - .1 Acceptable installation to include:
 - .1 Required slope at stone step's surface.
 - .2 No displacement at joints between stone steps.
 - .5 Perform mock-up where directed by Departmental Representative.
 - .6 Work not to proceed prior to approval of mock-up.
 - .7 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 00 10 – General Instructions and with manufacturer's written instructions.
- .2 Prevent damage and soiling of finishes during transporting, storing and handling.
- .3 Delivery and Acceptance Requirements:
 - .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .4 Storage:
 - .1 Keep materials dry.
 - .2 Protect materials against weather, freezing and sources of contamination.
 - .3 Store stones off ground surface.
- .5 Packaging Waste Management.
 - .1 Remove for reuse and recycling pallets, crates, padding and packaging materials in accordance with Section 01 00 10 – General Instructions.

Part 2 Products

2.1 EXISTING SALVAGED GRANITE STONE

- .1 Use hard, sound, and clean existing salvaged dismantled granite slabs and steps.

2.2 ACCESSORIES

- .1 Anchors: stainless steel type 302 or 304 in accordance with CSA A370.
 - .1 Masonry Anchors:
 - .1 For anchoring stones at steps:
 - .1 Type A: L-shaped stone pin anchor with 50 mm bend, 32 mm x 3 mm x length to suit location of existing holes in granite steps, with bolt fastener and 10 mm diameter x 76 mm long loose pin.
 - .2 For anchoring stones on landings:
 - .1 Type B: L-shaped stone anchor with 50 mm bend, 32 mm x 3 mm x length to suit location of existing holes in granite steps, with two bolt fasteners.
 - .2 Vertical Joint Filler: Pre-compressed cellular silicone and impregnated foam-based joint filler, thickness to suit joint width.
 - .3 Sealant and aggregate finish: in accordance with Section 07 92 00 - Joint Sealants.

Part 3 Execution

3.1 SITE VERIFICATION OF CONDITIONS

- .1 Report in writing to Departmental Representative areas of deteriorated masonry not previously identified.
- .2 Obtain Departmental Representative's approval and instructions for repair and replacement of masonry units before proceeding with repair work.
- .3 Stop work in that area and report to Departmental Representative immediately evidence of hazardous materials.

3.2 PREPARATION

- .1 Dressing of variable bottom surface of granite slabs and steps:
 - .1 Grind smooth local areas of underside of granite slabs correlating to locations of custom pedestal assembly supports where indicated for each Zone on Contract Drawings, and as required to ensure granite slab stability, alignment at joints and slope.
 - .2 Uneven granite slab and step top surfaces:
 - .1 Re-surface granite slab and step top surface to achieve level plane. Surface finish to match existing.
 - .2 Allow for re-surfacing of ten (10) slabs off site.
- .3 Clean stones by washing with water and natural fibre brush before laying.
- .4 Move and lift stone units using means to prevent damage. Submit stone units dropped or impacted to Departmental Representative for review. Do not make holes or indentations for Lewises or dogs in stone.
- .5 Install and remove shoring or other supports.

- .6 Install and remove self-supporting scaffolding in accordance with Section 01 00 10 – General Instructions.

3.3 PROTECTION OF IN-PLACE CONDITIONS

- .1 Protect adjacent plant material and fragile surfaces.
- .2 Protect adjacent building and landscaping components from marking or damage due to work.

3.4 MOVING STONES

- .1 Use hoisting and rigging methods and materials in accordance with IHSA recommendations and the Occupational Health and Safety Act.
- .2 Avoid damaging arrises of stones.
- .3 Protect edges of stone from damage when hoisting and lifting from storage and into position. Use separators or wood shims to isolate units from hoisting belts.
 - .1 Incorporate only undamaged stone in Work.

3.5 ANCHOR INSTALLATION

- .1 Install masonry anchors in accordance with CAN/CSA A370 and CAN/CSA A371 unless indicated otherwise.
- .2 Prior to installing joint filler and applying joint sealant, obtain approval of Departmental Representative of placement of anchors.
- .3 Install Type A masonry anchors in concrete riser at each masonry joint of granite steps as indicated on Contract Drawings.
 - .1 Drill 13 mm diameter x 38 mm deep holes in granite steps for insertion of masonry anchor pins.
- .4 Install Type B masonry anchors into concrete landing and side of stone. Secure stone slabs at edges of landings.
- .5 Position and adjust each anchor to suit condition and requirements at each installation location.

3.6 STONE RE-INSTALLING

- .1 Before proceeding with Work, inspect cleaned surface with Departmental Representative.
- .2 Clean stone before laying: wash with water and natural fibre brush.
- .3 Re-install granite slabs and steps in original locations according to recorded locations and orientation.
 - .1 Match alignment of adjacent stones and required slope.
 - .2 Lower stone in place.
 - .3 Check slope of stone surface.

- .4 Install custom pedestal assemblies to suit each individual granite slab and step.
- .5 Check slope of stone surface.
 - .1 If required slope not attained, raise stone up and repeat procedures until correct slope is achieved and slab stability is ensured.
- .4 Re-install salvaged granite slabs and steps on stone pea gravel bedding. Accurately align and level granite slabs and steps surfaces to slopes as indicated on Contract Drawings.
 - .1 Obtain smooth surface transition from slab to slab: Adjust stone pea gravel bedding as required.
- .5 Connect re-installed granite stone to installed anchors at locations indicated on Contract Drawings.
- .6 Re-install salvaged metal grilles in original locations at east and west ends of Lower Landing.

3.7 JOINT FILLER INSTALLATION

- .1 Install joint filler in accordance with manufacturer's written instructions.

3.8 CLEANING

- .1 Confirm acceptance of mock-up cleaning operations to demonstration from Departmental Representative before starting cleaning work.
- .2 Clean stone work surfaces after repairs have been completed and mortar has set.
- .3 Clean stone surfaces of adhesive or mortar residue resulting from work performed without damaging stone or joints.
- .4 Clear site of debris, surplus material and equipment, leaving work area in clean and safe condition.
- .5 Construction Waste Management.
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 00 10 – General Instructions.

3.9 PROTECTION OF WORK

- .1 Cover top of completed and partially completed work, not enclosed or sheltered, with weatherproof coverings at end of each working day.
 - .1 Anchor securely in position.
- .2 Protect adjacent finished work against damage which may be caused by on-going work.

END OF SECTION