
Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 04 03 42 – Historic works-Replacing stone.
- .2 Section 04 05 00 – Common Work Results for Masonry.

1.2 STORAGE AND PROTECTION

- .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 "Common Product Requirements".
- .2 Protect stone units and facilitate their reinstallation.
- .3 Store dismantled stone masonry units in the designated area on site. Protect from exposure to water, elements, and potential mechanical damage under shelter or fully covered with polyethylene. Units to be placed on wooden pallets and are not to sit directly on the ground. Should there be insufficient storage space on site, the contractor shall make arrangements to safely transport and store excess stone units off-site until required to return to the site. No additional costs can be claimed for off-site transport and storage.
- .4 Stone units designated for replacement with new units are to be retained for repair of other units. Unused removed stone units are to be handed over to the Departmental Representative. No stone units are to be disposed of without the Departmental Representative's approval.

1.3 SHORING AND OTHER TEMPORARY WORKS TO SUPPORT THE STRUCTURE

- .1 Refer to Section 04 05 00 – Common Work Results for Masonry.
- .2 Shoring and cradling, and other temporary framing work needed to support the structure shall be designed by a qualified structural engineer familiar with historic masonry structures and hired by the General Contractor. Shoring, cradling, and other temporary framing work design to be reviewed and approved by the Departmental Representative prior to the beginning of the works.

1.4 SEQUENCE AND MANNER

- .1 See section 01 14 23 – Sequence of the work.
- .2 The extent of stone masonry units that are to be removed and reinstalled is indicated on the drawings. Each of the stones dismantled on the project must be installed in their original position. The original pattern of the dismantled masonry zone must be preserved when reassembling with salvaged stones as well as with new stones. The new stones must be reproduced with the same width and height as the original stones and must return at the same position in the wall.

- .3 Mark stones and other elements or components to show their identity and position in the building. Markings to be done with aluminium tags of different colours with the stone number engraved on it and anchored at the back of the stone with a stainless steel fastener. Contractor must pre-pierce the stones before installing the medallion with its anchor. Position the medallion at least at 50mm from edge of stone.
- .4 **DISMANTLING AND REASSEMBLING PLAN:** General Contractor must hire a professional photographer to take high definition general pictures and produce a photogrammetric survey of all the areas to be dismantled and rebuilt for each façade. Contractor must digitally number all the stones to dismantle on the photogrammetric survey of the photographer. Submit the photogrammetric survey to Departmental Representative for approval. The numbers on the stones on the photogrammetric survey must correspond to numbers on the metal medallions on the stones. The photogrammetric survey and dismantling/rebuilding plan must be submitted to Departmental Representative 3 weeks before the beginning of the dismantling works for approval. It is formally forbidden to start dismantling of masonry as long as the dismantling plan and photogrammetric survey have not been reviewed and approved by Departmental Representative.
- .5 Keep the photogrammetric survey up-to-date and, produce a copy following all modifications.
- .6 Ensure that the key-pictures contain relevant information which will facilitate the reinstallation of each stone in its original location, as indicated on the drawings.
- .7 When requested, submit up-to-date copies of the photogrammetric survey as well as chronological information concerning each numbered unit (individual files of units).
- .8 The temporary protections as well as the windows must be removed before the beginning of the dismantling works.

1.5 SAMPLING OF THE WORKS

- .1 Submit a sample of engraved aluminum medallion for approval of Departmental Representative.
- .2 Make three marking samples of engraved aluminum medallion.
- .3 Make a mock-up of dismantling/rebuilding of 4mx4m of masonry of north wall (all stages, from marking to final product). Mock-up must also include demolition and reconstruction of brick substrate.
- .4 Make three pre-piercing samples for installation of anchors and dowels.
- .5 Do the cleaning of existing mortar residue on 50 stones of which 40 bossage limestone stones from Château-Richer. The samples must be executed by ALL masons who will be affected to this task for approval by Departmental Representative. Masons affected to this task cannot be replaced without prior written approval of Departmental Representative.

1.6 ACCEPTABLE PRODUCTS AND MATERIALS

- .1 Where a particular brand name is stipulated, see Instructions to Bidders for procedure for requesting approval of substitute materials and products

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 INSPECTION

- .1 Examine areas and conditions under which work is to be performed and notify the Departmental Representative in writing of conditions detrimental to the prescribed works and timely completion of the work.

3.2 EXAMINATION MARKING AND RECORDING

- .1 Before starting the work of this Section, follow the examination procedures specified in Section 04 03 41 "Repair of Stone". Mark all stones to be dismantled to show their identity and position in the building. Markings to be done with colored aluminium tag with the engraved stone number on it and anchored at the back of the stone with a stainless steel fastener. Position the medallion at least at 50mm from edge of stone.

3.3 SUPPORT OF WORK

- .1 Construct shoring and cradling, and other temporary framing work needed to support the structure, or parts of it, during removal operations and in anticipation of reinstallation, where the work is not to be completely dismantled, according to approved drawings, prepared by and bearing the seal and signature of the structural engineer referred to paragraph 1.3 above.

3.4 LOOSENING STONES

- .1 Rake-out all the mortar joints (as per section 04 03 07) and use approved methods to carefully loosen stones which will cause no damage either to stones or to other architectural elements. Rake-out carefully peripheral mortar joints by sawing a clearing saw cut. If stone is still solid in the wall, make deconsolidation openings of 150 mm deep with a bit drill in the peripheral joint and at each 50mm without damaging adjacent stones. If stone is not deconsolidated after borings; proceed with a saw with double parallel blades of type Arbotech. Remove the stones.
- .2 Remove all loose fragments and the deteriorated mortar of stone/ brick exposed substrate of wall. Remove all loose masonry elements and restore substrate as needed to permit installation of stone to replace.
- .3 Do not use circular millstone or saw, pneumatic chisel, steel tools exerting concentrated pressure on edges of stone. Obtain the Departmental Representative's approval for the use of power tools before commencing work.
- .4 Loosen wet masonry only when the temperature is above 15°C.

- .5 The General Contractor to be responsible for damage to stones being removed, adjacent stonework designated to remain and other adjacent construction. Repair such damage to the satisfaction of the Departmental Representative, at no additional cost to the Contract.

3.5 HANDLING

- .1 Contractor must submit for approval of Departmental Representative his strategy of handling, storage and transport. The use of Lewis bolts for handling stone is not permitted. Use straps for handling of stones, even for the big stones.
- .2 Place detached stones on wood pallets (not more than 3 rows of stones in height by pallet) during handling and avoid any contact with metal. Contractor must be particularly careful during operations of handling and of transport of stones to avoid damaging them. Contractor must mark by numbers the pallets. The stones must be attached and covered with a plastic membrane on the pallets, ready to be transported.
- .3 When stones are lowered to the deck, place directly on wooden platforms that will be used for their storage.
- .4 Ensure that sharp edges of stones do not come into contact with any hard object.
- .5 Do not place stones directly on ground or vegetation.
- .6 In freezing weather, keep stones dry.
- .7 Protect wet stones from freezing.

3.6 TEMPORARY STORAGE

- .1 Before storing them, place stones in a designated area for cleaning, detailed inspection and for final marking.
- .2 Ensure that stones are accessible and easily removed, and placed so as to be retrieved and inspected quickly, when required.
- .3 Store the stones in a fenced zone, under surveillance 24 /24 hres and without any automobile circulation.

3.7 STONE REASSEMBLY

- .1 Contractor must pre-pierce all existing stones to re-install with anchors as indicated on drawings, in order to insert the dowel of the anchor when reassembling. The pre-piercing avoids fragilised stones to fracture.
- .2 All recuperated stones to reinstall must be cleaned of all mortar residues on their arrises. This operation is delicate and must be done manually with chisel, with great care, to avoid losing the original stones.

3.8 CLEANING

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

- .3 Remove excess mortar by hand. Use power tools only with the prior written approval of the Departmental Representative.
- .4 Ensure masonry does not dry out too quickly. The drying process of stones may be accelerated by fans.

3.9 STORAGE

- .1 When stones are placed in storage. They must be protected from bad weather and disposed on wood pallets in good condition.
- .2 Lay out each stone in a manner so it will have its numbered face visible, and be accessible or removable without having to move adjacent stones.
- .3 Reproduce the plan showing how the stones are stored and have it approved by Departmental Representative.

3.10 MARKING AND REINSTALLATION

- .1 Aluminium marking medallion to be removed just before the stone reinstallation.

3.11 STONE MASONRY REPAIR

- .1 Repair individual stones as necessary in accordance with Section 04 03 41 "Repair of Stone".

END OF SECTION