

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 04 03 07 - Historic - Repointing.
- .2 Section 04 03 31 - Historic - Replacing Brick.
- .3 Section 04 03 41 - Historic - Repairing Stone.
- .4 Section 04 03 42 - Historic – Replacing Stone.
- .5 Section 04 03 43 - Historic - Dismantling Stone Masonry.
- .5 Section 04 05 00 - Common Work Results for Masonry.
- .6 Section 05 50 00 - Metal fabrications.

1.2 ALTERNATES

- .1 Obtain Departmental Representative's approval before changing manufacturer's brands or sources of supply of mortar materials during entire contract or other methods of mixing mortar specified elsewhere in this specification.

1.3 REFERENCES

- .1 CSA International
 - .1 CAN/CSA-A179, Mortar and Grout for Unit Masonry.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for mortar at least 15 days prior to commencing work. These data sheets must include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Provide samples in quantity and size in accordance with CAN/CSA-A179.
- .4 Test reports:
 - .1 Submit test results during site work as directed by Departmental Representative's as follows:
 - .1 Flow and cube strength: to ASTM C 270.
 - .2 Consistency (Vicat cone test): to ASTM C 780.
 - .3 Compressive strength (cube strength): to CAN/CSA-A179, annex B.
 - .4 Flexural bond strength: to ASTM C 1072.

1.5 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Mortar to be mixed by same mechanics throughout project.
- .2 Mock-ups:
 - .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
 - .2 Submit methods of reproducing existing mortar colour, texture and pointing types, and samples.
 - .3 Construct mock-up 1.5 m x 1.5 m.
 - .4 Mock-up will be used:
 - .1 To judge quality of work, substrate preparation, and material application.
 - .2 For testing to determine compliance with performance requirements.
 - .5 Locate as indicated by Departmental Representative.
 - .6 Notify Departmental Representative 48 hours before commencing mock-up.
 - .1 Obtain approval from Departmental Representative before commencing mock-up.
 - .7 Allow 48 hours for inspection of mock-up before proceeding with work.
 - .8 When accepted, mock-up will demonstrate minimum standard for this Work. Approved mock-up will remain as part of finished work.
- .3 Site tests:
 - .1 Testing on bedding/repointing mortar shall be carried out by a Testing Laboratory designated by the Departmental Representative and hired by the Contractor. The laboratory tests shall occur once a week during the entire mortaring operations throughout the project. The tests shall be done with on-site fresh samples and shall include:
 - .1 Compressive strength at 7 days and 28 days;
 - .2 Air entrainment %age;
 - .3 Vicat cone testing;
 - .4 Flexural strength.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and 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 off ground, in dry location, and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store cementitious materials and aggregates in accordance with CSA A23.1/A23.2.
 - .3 Protect from weather, freezing and contamination.

- .4 Remove rejected or contaminated material from site.
- .5 Store and protect mortar materials from nicks, scratches, and blemishes.
- .6 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.7 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Provide weather-tight enclosure to store materials and mix mortars, maintain air temperature above 10 degrees C at all times.
 - .2 Maintain maximum/minimum thermometers and relative humidity gauges on site and in enclosures.
 - .1 Maintain a daily record of temperature and humidity.
- .2 Install relative humidity and temperature equipment, record temperature and relative humidity and submit report to Departmental Representative.
- .3 Implementation
 - .1 Execute work when ambient temperature is above 10 °C. When ambient temperature is below 10 °C, cover and heat work as directed by Departmental Representative.
 - .2 Prepare and maintain temperature of mortar between 5 and 40 °C until used.
 - .3 Maintain the temperature of receiving surfaces and mortar between 10 and 25 °C for 72 hours after application in summer and for 30 days in winter.

Part 2 Products

2.1 MATERIALS

- .1 Water: potable, clean and free from contaminants.
- .2 Type N Joint and bedding mortar for chimney stalks and openings in the attic's floor
 - .1 Prepared based on proportion specifications, consisting of 1 part grey Portland cement, 1 part hydrated lime, and 6 parts controlled grain size sand.
 - .2 All dry mortar materials shall be premixed at the plant, bagged and originate from one (1) only manufacturer.
- .3 Restoration mortar for limestone
 - .1 Two-component, latex-modified, cementitious compound, of a registered trademark, premixed at the plant with color, texture and physical properties closely matching those of the stone to be repaired.
 - .1 The compound must be specially formulated for limestone
 - .2 The pre-mixed compound must require, on site, only the addition of water and latex (of a grade corresponding to the temperature at the moment of installation). The adhesive must already be in the compound.

- .3 Compound properties: permeable to water vapour, anti-shrinkage, and frost resistant.
 - .1 Adhesion (direct tensile bond) : 205 psi
 - .2 Modulus of elasticity (ASTM C1042) : $< 1 \times 10^6$ psi
 - .3 Moisture vapour permeance (ASTM E96): 12-23 perms @12 mm depth
 - .4 Freeze-thaw resistance (after 10 years of natural exposure) : no scaling or delamination
 - .5 Drying shrinkage (ASTM C157) : $< 0.05\%$ (low)
- .4 The Contractor will have to work with three (3) different restoration mortar colours based on the colour of the stones to be repaired. Submit three samples for each colour.
- .4 Mortar for anchoring the gutters' wrought iron brackets
 - .1 Injectable mortar: two-component, fast curing hybrid adhesive.
- .5 Protection mortar for the new drains inside the sunken court
 - .1 Polymer-modified, with migrating corrosion inhibitor added, cementitious, two-component, fast-setting, trowel-grade, patching mortar.
 - .2 Having the following properties at 23 °C and 50 % relative humidity:
 - .1 Density ASTM C185: 2200 kg/m³
 - .2 Compressive strength ASTM C109
 - .1 24 hrs: 18 MPa
 - .2 7 days: 37 MPa
 - .3 28 days: 50 MPa
 - .4 Modulus of elasticity ASTM C469
 - .1 7 days: 23 GPa
 - .2 28 days: 26 GPa
 - .5 Tensile Splitting Strength ASTM C496
 - .1 21 days: 5,5 MPa
 - .6 Bond strength ASTM C882
 - .1 24 hrs: 9 MPa
 - .2 28 days: 19 MPa
 - .7 Rapid Chloride Permeability AASHTO T277
 - .1 14 days: 375 Coulombs
 - .8 Application thickness (without aggregates):
 - .1 3 mm minimum and 38 mm maximum
 - .9 Colour: concrete grey when mixed
- .6 Hand-held mixer.
- .7 Containers for mixing.

2.2 ALLOWABLE TOLERANCES

- .1 Mortar compression strength
 - .1 Compressive strength measured on collected samples shall comply with the following:
 - .1 Type N mortar
 - .1 2 MPa, cured for 7 days.
 - .2 3,5 MPa, cured for 28 days.
- .2 Air content : 18 % maximum.

Part 3 Execution

3.1 GENERAL PREPARATIONS

- .1 Premixed mortar
 - .1 Follow manufacturer's written instructions.
 - .2 Whole bag has to be prepared.
 - .3 Apply Vicat cone test to ensure desirable performance of the mortar and record results.

3.2 PREPARATION OF MORTAR

- .1 Premixed mortar
 - .1 Mix mortar in a clean mortar mixer. Use potable water in quantities recommended by the manufacturer and mix as indicated.

3.3 MIXING

- .1 General:
 - .1 Use batching box.
 - .2 Follow proper batching procedure.
 - .3 Monitor mixing time.
- .2 Mortar:
 - .1 Mix Characteristics:
 - .1 Pointing mortar: slightly stiffer than bedding mortar with a consistency such that the mortar can be hand-formed into a stiff ball.
 - .2 Record amount of water required to reach this consistency and use for subsequent mixes.
 - .2 Prepare only enough mortar to be used within two hours. Do not retemper mortar beyond this time.
- .3 Follow manufacturer instructions when premixed mortar is used.

- .4 Contractor to appoint 1 individual to mix mortar for duration of project. If this individual must be changed, mortar mixing must cease until new individual is trained, and mortar mix is tested.

3.4 CONSTRUCTION

- .1 Do masonry mortar and grout work in accordance with CAN/CSA-A179 except where specified otherwise.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Remove droppings and splashings using clean sponge and water.
- .4 Clean masonry with low pressure 15 psi clean water and soft natural bristle brush.
- .5 Obtain approval of Departmental Representative prior to using other cleaning methods for persistent stains.
- .6 Waste Management: separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 PROTECTION OF COMPLETED WORK

- .1 Cover completed and partially completed work not enclosed or sheltered at end of each work day.
 - .1 Protection membranes should be secured to withstand the high winds and harsh weather to which the building is fully exposed.
- .2 Enclose and protect work using wetted geotextiles.
- .3 Cover with waterproof tarps to prevent weather from eroding recently laid material.
 - .1 Maintain tarps in place for minimum of 2 weeks after laying.
 - .2 Ensure that bottoms of tarps permit airflow to reach mortar in joints.
- .4 Anchor coverings securely in position.

END OF SECTION