

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 32 14 10.1 – Unit Paving on Masonry Sand Bed

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CAN/CSA A179-04, Mortar and Grout for Unit Masonry.
 - .3 CAN/CSA A371-04, Masonry Construction for Buildings.
 - .4 CAN/CSA-A3000-03, Cementitious Materials Compendium; CAN/CSA-A3002-03, Masonry and Mortar Cement.
- .2 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
 - .1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .3 American Society for Testing and Materials (ASTM)
 - .1 ASTM C881/C881M-10 Table 1 Physical Requirements of Bonding Systems

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Provide manufacturer's printed product literature, specifications and datasheets. Include product characteristics, performance criteria, and limitations.
 - .3 Provide two copies of Workplace Hazardous Materials Information System (WHMIS) - Material Safety Data Sheets (MSDS) in accordance with Section 01 35 29.06 - Health and Safety Requirements, 01 35 43 - Environmental Procedures. Indicate VOC's mortar, grout, parging, colour additives and admixtures. Expressed as grams per litre (g/L).
- .2 Samples:
 - .1 Samples: provide unit samples in accordance with Section 32 14 10.1 for mock-up, supplemented as follows:
 - .1 Provide two 1 litre size samples of mortar.
 - .2 Provide sample of mortar in mock-up of paver installation.
 - .3 Provide confirmation of source or product data sheet, prior to mixing or preparation of mortars, to Departmental Representative of:
 - .1 Aggregate: sand.
 - .2 Cement.
 - .3 Lime.

National War Memorial Structural Upgrades**MASONRY MORTAR AND GROUT**

PWGSC Project No. R.009716.012

Page 2 of 6

- .4 Colour pigment samples.
- .5 Additives required

.3 Manufacturer's Instructions:

- .1 Provide manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties as follows:

- .1 Submit laboratory test reports.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

.4 Mock-ups:

- .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and requirements of Section 32 14 10.1 Unit Paving supplemented as follows:

- .1 Construct mock-up sample panel of pointing.
- .2 Sample panel: 1000 mm x 100 mm minimum using proposed procedures, colours, texture, finish and workmanship.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handles masonry mortar and grout materials as follows:

- .1 Deliver prepackaged, dry-blended mortar mix to project site in labelled plastic-lined bags each bearing name and address of manufacturer, production codes or batch numbers, and colour or formula numbers.
- .2 Maintain mortar, grout and packaged materials clean, dry, and protected against dampness, freezing, traffic and contamination by foreign materials.

.2 Packaging Waste Management: remove for reuse and return of pallets crates padding packaging materials.

1.6 SITE CONDITIONS

.1 Ambient Conditions: maintain materials and surrounding air temperature to:

- .1 Minimum 5 degrees C prior to, during, and 48 hours after completion of masonry work.
- .2 Maximum 32 degrees C prior to, during, and 48 hours after completion of masonry work.

.2 Weather Requirements: CAN/CSA A371 International Masonry Industry All-Weather Council (IMIAC) - Recommended Practices and Guide Specifications for Hot and Cold Weather Masonry Construction.

National War Memorial Structural Upgrades**MASONRY MORTAR AND GROUT**

PWGSC Project No. R.009716.012

Page 3 of 6

Part 2 Products**2.1 MATERIALS**

- .1 Use same brands of materials and source of aggregate for entire project.
- .2 Cement:
 - .1 Portland Cement: to CAN/CSA-A3000, HS - High-sulphate-resistant hydraulic cement (Type 50) gray colour.
- .3 Aggregate: supplied by one supplier.
 - .1 Fine Aggregate: to CAN/CSA A179, clean sharp sand.
- .4 Water: clean and potable.
- .5 Bonding Agent: Epoxy type III, Grade 2 in accordance with ASTM C881, Table 1 Physical Requirements of Bonding Systems.

2.2 ADMIXTURES

- .1 Water Repellent Agents: powdered and suitable for grout and mortar mixtures.
- .2 Air Entrainment Agents: synthetic liquid type, 15 to 30 ml / bag of portland cement added to mix.

2.3 MORTAR MIXES

- .1 Mortar : for pavements, walks, patios and other exterior masonry at grade: type M based on the following proportion specifications:
 - .1 18 round nosed shovels of sand
 - .2 1 bag of Portland type 50 cement
 - .3 Approximately 23 litres of water mixed 50/50 with bonding agent per bag of cement
 - .4 15-30 ml of specified air entrainment agent
 - .5 230 ml of specified water repellent agent.

2.4 MORTAR MIXING

- .1 Mix mortar ingredients in accordance with CAN/CSA A179 in quantities needed for immediate use.
- .2 Maintain sand uniformly damp immediately before mixing process.
- .3 Add admixtures in accordance with manufacturer's instructions. Provide uniformity of mix and colouration.
- .4 Do not use anti-freeze compounds including calcium chloride or chloride based compounds.
- .5 Use a batch type mixer in accordance with CAN/CSA A179.
- .6 Re-temper mortar only within two hours of mixing, when water is lost by evaporation.
- .7 Use mortar within 2 hours after mixing at temperatures of 32 degrees C, or 2-1/2 hours at temperatures under 5 degrees C.

National War Memorial Structural Upgrades**MASONRY MORTAR AND GROUT**

PWGSC Project No. R.009716.012

Page 4 of 6

2.5 GROUT MIXES

- .1 Grout: Minimum compressive strength of 12.5 MPa at 28 days. Maximum aggregate size and grout slump: CAN/CSA A179.

2.6 GROUT MIXING

- .1 Mix batched and delivered grout in accordance with CAN/CSA-A23.1 transit mixed.
- .2 Mix grout ingredients in quantities needed for immediate use in accordance with CAN/CSA A179 coarse grout.
- .3 Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- .4 Do not use calcium chloride or chloride based admixtures.

2.7 MIX TESTS

- .1 Testing Mortar Mix:
 - .1 Test mortar to requirements of Section 01 45 00 - Quality Control, and in accordance with CAN/CSA A179, for mortar based on property specification proportion specification. Test prior to construction during construction for:
 - .1 Compressive strength.
 - .2 Consistency.
 - .3 Mortar aggregate ratio.
 - .4 Sand/cement ratio.
 - .5 Water content and water/cement ratio.
 - .6 Air content.
 - .7 Splitting tensile strength.
- .2 Testing Grout Mix:
 - .1 Test grout to requirements of Section 01 45 00 - Quality Control, and in accordance with CAN/CSA A179, for grout based on property specification proportion specification. Test prior to construction during construction for:
 - .1 Compressive strength.
 - .2 Sand/cement ratio.
 - .3 Water content and water/cement ratio.
 - .4 Slump.
- .3 Provide grout and mortar mix tests to Departmental Representative for review prior to use in the mockup and final installation. Make adjustments to mixture and re-test if required because of unacceptable tests to achieve acceptable test results.

Part 3 Execution**3.1 EXAMINATION**

- .1 Request inspection of spaces to be grouted.

National War Memorial Structural Upgrades**MASONRY MORTAR AND GROUT**

PWGSC Project No. R.009716.012

Page 5 of 6

3.2 PREPARATION

- .1 Ensure all surfaces to receive mortar setting bed for pavements are clean and free from dust, debris and any extraneous materials.

3.3 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.4 CONSTRUCTION

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

3.5 MIXING

- .1 All pointing mortar can be mixed using a regular paddle mixer. Only electric motor mixers are permissible. Mixers run on hydrocarbons are not permitted, due to fumes, Mixing by hand must be pre-approved by the Departmental Representative.
- .2 Clean all mixing boards and mechanical mixing machine between batches.
- .3 Mortar must be weaker than the units it is binding.
- .4 Contractor to appoint one individual to mix mortar, for duration of project. In the event that this individual must be changed, mortar mixing must cease until the new individual is trained, and mortar mix is tested.

3.6 MORTAR PLACEMENT

- .1 Install mortar and grout to requirements of Section 32 14 10.1
- .2 Remove excess mortar from grout spaces.

3.7 GROUT PLACEMENT

- .1 Install grout in accordance with manufacturer's instructions.
- .2 Install grout in accordance with CAN/CSA A179.
- .3 Work grout into masonry cores and cavities to eliminate voids.
- .4 Do not install grout in lifts greater than 400 mm, without consolidating grout.

3.8 FIELD QUALITY CONTROL

- .1 Site Tests, Inspection as follows:
 - .1 Test and evaluate mortar prior to construction in accordance with CAN/CSA A179.
 - .2 Test and evaluate grout prior to construction to CAN/CSA A179; test in conjunction with masonry unit sections specified.

3.9 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .2 Remove droppings and splashings using clean sponge and water.
- .3 Clean unit pavers with low pressure clean water and soft natural bristle brush.

3.10 PROTECTION OF COMPLETED WORK

- .1 Cover completed and partially completed work not enclosed or sheltered with waterproof covering at end of each work day. Anchor securely in position.

3.11 SCHEDULE

- .1 Use non-staining mortar for all stone unit pavers

END OF SECTION