

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 Submittal Procedures
- .2 Section 01 45 00 Quality Control
- .3 Section 03 45 00 Precast Architectural Concrete
- .4 Section 04 05 12 Stone Veneer Cladding
- .5 Section 07 62 00 Sheet Metal Flashing and Trim

1.2 REFERENCES

- .1 CSA Group
 - .1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A179-04(R2009), Mortar and Grout for Unit Masonry.
 - .3 CAN/CSA-A371-04(R2009), Masonry Construction for Buildings.
 - .4 CAN/CSA-A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .2 International Masonry Industry All-Weather Council (IMIAC)
 - .1 Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

1.3 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 masonry mortar and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures. Indicate VOC's mortar, grout, parging, colour additives and admixtures. Expressed as grams per litre (g/L).
- .3 Samples:
 - .1 Samples: submit unit samples in accordance with Section 04 05 00 - Common Work Results for Masonry, supplemented as follows:
 - .1 Submit two samples of each type of mortar and grout specified.
 - .2 Submit samples, prior to mixing or preparation of mortars, to Departmental Representative of:
 - .1 Aggregate: [course aggregate] [and] [sand].
 - .2 Cement.
 - .3 Lime.
 - .4 Colour pigment samples.
- .4 Manufacturers' Instructions: submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 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 Maintain mortar, grout and packaged materials clean, dry, and protected against dampness, freezing, traffic and contamination by foreign materials.

1.6 SITE CONDITIONS

- .1 Ambient Conditions: maintain materials and surrounding air temperature to:
 - .1 Minimum 5°C prior to, during, and 48 hours after completion of masonry work.
 - .2 Maximum 32 °C prior to, during, and 48 hours after completion of masonry work.
- .2 Weather Requirements: to CAN/CSA-A371 and IMIAC - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction].

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 gray colour.
 - .1 Use low VOC products,
 - .2 Masonry Cement: to CAN/CSA-A3002 and CAN/CSA-A179, Type N and S.
 - .3 Mortar Cement: to CAN/CSA-A3002 and CAN/CSA-A179, Type N and S.
 - .1 Use low VOC products [in compliance with SCAQMD Rule 1168.
 - .4 Packaged Dry Combined Materials for mortar: to CAN/CSA-A179, Type N and S, using gray colour cement.
- .3 Aggregate: supplied by one supplier.
 - .1 Fine Aggregate: to CAN/CSA-A179.
 - .2 Course Aggregate: to CAN/CSA-A179.

- .4 Water: clean and potable.
- .5 Lime:
 - .1 Quick Lime: to CAN/CSA-A179, Type [N] [NA] [S] [SA].
 - .2 Hydrated Lime: to CAN/CSA-A179, Type [S] [SA].
- .6 Bonding Agent: [latex] [epoxy] type.
- .7 Polymer Latex: organic polymer latex admixture of butadiene-styrene type non-emulsifiable bonding admixture.

2.2 COLOUR ADDITIVES

- .1 Use colouring admixture not exceeding 10% of cement content by mass, or integrally coloured masonry cement, to produce coloured mortar to match approved sample. Admixtures to be approved prior to use. Use in accordance with the specific manufacturer's recommendations.
- .2 Powder: inorganic mineral oxide pigment; gray colour.

2.3 ADMIXTURES

- .1 Water Repellent Agents: powdered, liquid or polymeric.
 - .1 Use low VOC products

2.4 MORTAR MIXES

- .1 Mortar for exterior masonry above grade:
 - .1 Load Bearing: type S based on proportion specifications.
 - .2 Non-Load Bearing: N based on proportion specifications.
- .2 Mortar for interior masonry:
 - .1 Load Bearing: type S based on proportion specifications.
 - .2 Non-Load Bearing: N based on proportion specifications.
- .3 Pointing Mortar: CAN/CSA-A179, Type N using property specification with maximum 2 percent ammonium stearate or calcium stearate per cement weight].
- .4 Stain Resistant Pointing Mortar: one part Portland cement, 1/8 part hydrated lime, and two parts graded (80 mesh) aggregate, proportioned by volume. Add aluminum tristearate, calcium stearate, or ammonium stearate to 2 percent of Portland cement by weight.
- .5 Parging Mortar: type N to CAN/CSA-A179.
- .6 Following applies regardless of mortar types and uses specified above:
 - .1 Mortar for calcium silicate brick and concrete brick: type O based on proportion specifications.
 - .2 Mortar for stonework: type N based on proportion specifications.
 - .3 Mortar for grouted reinforced masonry: type S based on proportion specifications.

2.5 MORTAR MIXING

- .1 Use pre-blended, pre-coloured mortar prepackaged under controlled factory conditions. Ingredients batching limitations to be within 1% accuracy.
- .2 Mix mortar ingredients in accordance with CAN/CSA-A179 in quantities needed for immediate use.
- .3 Maintain sand uniformly damp immediately before mixing process.
- .4 Add mortar colour and admixtures in accordance with manufacturer's instructions. Provide uniformity of mix and colouration.
- .5 Do not use anti-freeze compounds including calcium chloride or chloride based compounds.
- .6 Do not add air entraining admixture to mortar mix.
- .7 Use a batch type mixer in accordance with CAN/CSA-A179.
- .8 Pointing mortar: prehydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp unworkable mix that will retain its form when pressed into ball. Allow to stand for not less than 1 hour no more than 2 hours then remix with sufficient water to produce mortar of proper consistency for pointing.
- .9 Re-temper mortar only within two hours of mixing, when water is lost by evaporation.
- .10 Use mortar within 2 hours after mixing at temperatures of 32 °C, or 2-1/2 hours at temperatures under 5° C.

2.6 GROUT MIXES

- .1 Bond Beams: grout mix 10 to 12.5 MPa strength at 28 days.
- .2 Grout: Minimum compressive strength of 12.5 MPa at 28 days. Maximum aggregate size and grout slump: CAN/CSA-A179.

2.7 GROUT MIXING

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

2.8 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 proportion specification. Test prior to 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 proportion specification. Test prior to construction for:
 - .1 Compressive strength.
 - .2 Sand/cement ratio.
 - .3 Water content and water/cement ratio.
 - .4 Slump.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for masonry installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PREPARATION

- .1 Apply bonding agent to existing concrete surfaces.

3.3 CONSTRUCTION

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

3.4 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.
- .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.

3.5 MORTAR PLACEMENT

- .1 Install mortar to manufacturer's instructions.
- .2 Install mortar to requirements of CAN/CSA-A179.
- .3 Remove excess mortar from grout spaces.

3.6 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 by rodding.
- .5 Do not displace reinforcement while placing grout.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Remove droppings and splashings using clean sponge and water.
- .3 Clean masonry with low pressure clean water and soft natural bristle brush.
- .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .5 Waste Management: separate waste materials for reuse and recycling 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.

3.8 PROTECTION

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

3.9 SCHEDULE

- .2 Use coloured mortar for exterior column bases and interior fireplace finish.

END OF SECTION

PART 1 – GENERAL

1.1 RELATED SECTIONS

- .1 Section 04-43-13 Stone Masonry Veneer

1.2 REFERENCES

- .1 CCMPA Canadian Concrete Masonry Producers Association Metric Technical Manual, September 2004.
- .2 CAN/CSA-A3000-13, Cementitious Materials Compendium.
- .3 CSA A23.1-14/A23.2-14, Concrete materials and methods of concrete construction / Test methods and standard practices for concrete.
- .4 CSA A165 Series-14 (CSA A165.1 Concrete Masonry Units) (CSA A165.2 Concrete Brick Units) (CSA A165.3 Prefaced Concrete Masonry Units).
- .5 CAN/CSA-A179-14, Mortar and Grout for Unit Masonry.
- .6 CAN/CSA-A370-14, Connectors for Masonry.
- .7 CAN/CSA-A371-14, Masonry Construction for Buildings.
- .8 CSA G30.18-09 (R2014), Carbon Steel Bars for Concrete Reinforcement.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Concrete block to CSA-A165.1: CCMPA Metric Size Codes indicated, 190 high x 390 mm long x thickness indicated.
 - .1 H/15/A/M, hollow, normal weight for partitions, CCMPA size code 10, 15, 20.
 - .2 SF/15/A/M, full solid, normal weight for top course of load bearing walls, CCMPA size code 15, 20.

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- .3 H/15/C/M, hollow, lightweight where exposed, CCMPA size code 10, 15, 20.
- .4 Special shapes: provide bullnosed units for exposed corners. Provide purpose-made shapes for lintels, beams and bond beams. Provide additional special shapes as indicated.
- .2 Mortar: to CAN/CSA-A179, Proportion specification. Select type from table below.
 - .1 Exterior above grade:
 - .1 Type S: loadbearing walls requiring high compressive strength.
 - .2 Type N: loadbearing walls requiring low compressive strength.
 - .3 Type N: Non-loadbearing walls, parapet walls.
 - .2 Exterior at or below grade:
 - .1 Type M: foundation walls, retaining walls, manholes, sewers, pavements, walks and patios.
 - .3 Interior:
 - .1 Type N: loadbearing walls and non-loadbearing partitions.
 - .4 Fine grout to Table 3:
 - .5 Parging: Mortar Types M, S, or N, are suitable for parging. Match mortar used for masonry, or use Type N if masonry mortar is weaker than aforementioned types, or if type is not known.
- .3 Cell vent weep-hole ventilator: flexible U.V. resistant polypropylene co-polymer, sized to match masonry units, colours selected from manufacturer's standard range.
- .4 Concrete aggregate: to CSA A23.1/A23.2, 10 mm maximum size.
- .5 Precast concrete sills:
 - .1 Cement: to CAN/CSA-A3001, type GU.
 - .2 Compressive strength: 30 MPa at 28 days.
 - .3 Exposure class: F-1 to CSA A23.1/A23.2.
 - .4 Aggregate size: 10 mm maximum size to CSA A23.1/A23.2.
 - .5 Air content: 6%
 - .6 Water: potable.
 - .7 Finish: acid washed.
 - .8 Size: S - 1 - Pier Cap as indicated on drawing.

PART 3 – EXECUTION

3.1 MIXING AND APPROVAL

- .1 In accordance CAN/CSA-A179.
- .2 Concrete mix shall attain:
 - .1 25 MPa compressive strength at 28 days.
 - .2 100 mm slump at time of deposit.

3.2 PROTECTION

- .1 Protect in accordance with CAN/CSA-A371, except following requirements supplement Clause 6.7.2:
 - .1 Maintain temperature of mortar between 5°C and 50°C until used.

3.2 INSTALLATION AND WORKSMENSHIP

- .1 In accordance with CAN/CSA-A371.
- .2 Joints of uniform thickness. Tolerances suggested in notes to Clause 7.1 of CAN/CSA-A371 apply.
- .3 Align vertical joints.
- .4 Cut masonry with power saw.
- .5 Fill concrete block of piers solid. Obtain wood column base anchors and set in place at required location.
- .6 Lightly wet set masonry surfaces before laying abutting masonry.
- .7 Remove surplus mortar and mortar droppings as work progresses.
- .8 Running bond.

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3.4 CLEANING

- .1 Remove excess mortar and smears.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 Submittal Procedures
- .2 Section 01 45 00 Quality Control
- .3 Section 01 61 00 Common Product Requirements
- .4 Section 03 45 00 Precast Architectural Concrete
- .5 Section 04 05 12 Masonry Mortar and Grout
- .6 Section 07 62 00 Sheet Metal Flashing and Trim

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI A108.1-13, Installation of Ceramic Tile (Includes ANSI A108.1A-C, 108.4-.13, A118.1-.10, A136.1).
- .2 ASTM International
 - .1 ASTM C 144-11, Standard Specification for Aggregate for Masonry Mortar.
 - .2 ASTM C 207-06(2011), Standard Specification for Hydrated Lime for Masonry Purposes.
 - .3 ASTM C 615 – Standard Specification for Granite Dimension Stone.
 - .4 ASTM C 847 – Standard Specification for Metal Lath.

1.3 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 stone masonry veneer cladding and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit sample for each finish product specified.
 - .2 Submit verification samples for each finish product specified, two (2) samples, approximately 300 mm square, representing actual product, colour, texture, and patterns.

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test showing compliance with specified performance characteristics and physical properties.
- .2 Have work performed by a recognized established company specializing in ceramic tile, thin brick, manufactured veneer, mosaic and trim unit with at least three (3) years experience and with skilled workers thoroughly trained.

- .3 Do not use frozen materials or material mixed or coated with ice or frost. Comply with cold-weather construction requirements contained in ACI 530.1-08/ASCE6-08/TMS 602-08.

1.5 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, labeled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect stone veneer.
 - .3 Replace defective or damaged materials with new.

1.6 AMBIENT CONDITIONS

- .1 Install only when temperature is more than 12°degrees C and less than 38°C, unless approval is received by manufacturer.
- .2 Maintain temperatures above 12° C until cementitious materials have fully cured.
- .3 Apply epoxy mortar and grouts at temperatures above 15° C and below 25° C.

2 PRODUCTS

2.1 MATERIALS

- .1 System Description:
 - .1 Provide Natural Thin Stone Veneer installed over concrete masonry unit or cementitious backer board substrates using latex Portland cement mortar and latex Portland cement grout.
 - .2 Interior Applications: veneer adhered directly to cementitious backer board on steel studs.
 - .3 Exterior Applications: veneer adhered directly to concrete masonry units, supported on cast-in-place concrete piers.
 - .4 Stone: quarried granite ranging in size from 13mm to 45mm.
 - .5 Veneer Pattern: style River Rock
 - .6 Hearthstone and Mantel : Natural finish Granite slab, 1830mm long x 610mm wide x 50mm thick with natural split face edges.
 - .1 Joints to be finished with Portland Cement grout and colour matched to slabs.

- .7 Acceptable Product:
 - .1 Granite Collection by Masonal Stone Inc.
 - .2 Equivalent approved by Departmental Representative

2.2 MORTAR AND ADHESIVE MATERIALS

- .1 Cement: to CAN/CSA-A3001, type GU.
- .2 Sand: to ASTM C 144, passing 16 mesh.
- .3 Hydrated lime: to ASTM C 207, Type N or S.
- .4 Latex additive: formulated for use in cement mortar and thin set bond coat.
- .5 Water: potable and free of minerals and chemicals which are detrimental to mortar and grout mixes.
- .6 Dry set cement mortar: to ANSI A108.1.
- .7 Latex Cement mortar: to ANSI A108.1.

2.3 GROUT

- .1 Cement grout: to ANSI A108.1.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for marble veneer cladding installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval to proceed from Departmental Representative.
- .2 Verify that framing and substrates are sufficient for applicable loading of slabs and veneer installed above.

3.2 PREPARATION

- .1 Maintain uniform joint widths of joints 6 mm to 13mm, except for variation due to stone size variations and minor variations required to maintain alignment.
- .2 Install concealed flashing and weep holes at shelf angles, lintels, ledges, and similar obstructions to downward flow of water. Cut-in reglets for flashings where indicated.
- .3 Round stone edges to 13mm radius, where subject to foot traffic.
- .4 Cut stone for anchors, cramps, dowels as required.

3.3 INSTALLATION

- .1 Clean granite veneer and slabs removing dirt or foreign matter from edges and surfaces.
 - .1 Do not use wire brushes.
- .2 Set granite slabs plumb and accurately in position with anchors securely placed.
- .3 Set slabs firmly against mortar spots located at or near anchors and spaced at [500] mm maximum apart over back of slab.
- .4 Attach anchors to back-up wall, fill anchor holes and encase anchors in mortar.
- .5 Make joints uniform and of indicated width.
- .6 Prevent soiling, chipping or defacing of stone veneer.
 - .1 Remove mortar droppings and wash clean.
- .7 Pointing: remove dirt and loose mortar from joints by using pressure air stream.
 - .1 Wet joints for mortar pointing.
 - .2 Dry joints for sealant pointing. .

3.4 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

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.
 - .1 Wash stone veneer with soft fibre brushes, soap powder and clean water.
 - .2 Remove surplus and excess materials, rubbish, tools and equipment.

3.6 SCHEDULE

- .1 Type of stone material: Granite Veneer.
 - .1 Location 1 : Exterior column bases
 - .2 Location 2: Interior Dining Hall Fireplace.
- .2 Type of stone material: Granite Slab.
 - .1 Location : Interior Dining Hall Fireplace Hearth and Mantel

END OF SECTION