

MASONRY PROCEDURES

1. GENERAL

1.1 Quality Control

- .1 Conform to requirements of CSA A370, CSA A371 and design requirements of CSA S304.1 except where more stringent requirements are noted and/or indicated on Drawings and specified herein.
- .2 Provide for compartments in long cavity wall and at corners to achieve appropriate pressure equalization and drainage in cavity wall design.
- .3 Engineered Masonry: Conform to CSA A371 and CAN3-S304.1 and to details as indicated on structural Drawings.

1.2 Samples

- .1 Submit duplicate full-size units samples or samples of size indicated, of each type of products specified for the Work, cured and finished in manner specified, and physically identical with material or product selected, and that show full range of color and texture variations expected.
 - .1 Masonry Units: Full size units.
 - .2 Stone Units: Random size units.
 - .3 Masonry Accessories: 300 mm (12") long.
 - .4 Masonry Reinforcement, Ties and Corners: 300 mm (12") long, or full size sample.
 - .5 Coloured Mortar: 150 mm (6") long

1.3 Test Reports

- .1 Submit triplicate copies of test reports.
 - .1 Masonry Units and Mortar Ingredients: Certifying compliance of masonry units and mortar ingredients with specification requirements.

1.4 Sample Installation

- .1 Provide a 3 m x 3 m (10' x 10') representative sample installation of work of this Section on Site at location directed by Contract Administrator to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - .1 Showing masonry colours and textures, use of reinforcement, ties, through-wall flashing, weep holes, jointing, coursing, mortar and workmanship.

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- .2 Incorporate cavity insulation and air barrier specified in other Sections.
- .2 Remove rejected sample installation and provide additional sample installations until acceptance is given. Do not commence Work until sample installation has been accepted. Accepted sample installation will not form part of the completed Work. Remove as directed by Contract Administrator.
- .3 Acceptance of sample installations does not constitute acceptance of deviations from the Contract Documents contained in sample installations unless such deviations are specifically accepted by Contract Administrator in writing.
- .4 Allow seventy two (72) hours for review of sample installation by Contract Administrator before proceeding with Work.

1.5 Delivery, Storage and Handling

- .1 Deliver materials to Job Site in dry condition.
- .2 Keep materials dry until use.
- .3 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

1.6 Environmental Requirements

- .1 Cold Weather Requirements: Supplement CSA-A371 with following requirements:
 - .1 Maintain temperature of mortar between 5°C and 50°C until batch is used.
- .2 Hot Weather Requirements:
 - .1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.
 - .2 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until masonry work is completed and protected by flashings or other permanent construction.
 - .3 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.
 - .4 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

2. PRODUCTS (NOT USED)

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3. EXECUTION

3.1 Installation

- .1 Do masonry work in accordance with CSA-A371 except where specified otherwise.
- .2 Build masonry plumb, level, true to line, with vertical and horizontal joints in alignment.
- .3 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

3.2 Construction

- .1 Exposed Masonry: Remove chipped, cracked, and otherwise damaged units in exposed masonry and replace with undamaged units.
- .2 Jointing:
 - .1 Concave Joints: Allow mortar to set just enough to remove excess water, then tool with round jointer to provide smooth, joints true to line, compressed, uniformly concave joints.
 - .2 Flush Joints: Strike flush all joints concealed in walls and joints in walls to receive plaster, tile, insulation, or other applied material except paint or similar thin finish coating.
- .3 Cutting:
 - .1 Cut out for electrical switches, outlet boxes, and other recessed or built-in objects.
 - .2 Make cuts straight, clean, and free from uneven edges.
- .4 Building-In:
 - .1 Build in items required to be built into masonry.
 - .2 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as work progresses.
 - .3 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar.
- .5 Support of Loads:
 - .1 Use concrete to requirements of Division 3 Section 03300 – Cast-in-Place Concrete, where concrete fill is used in lieu of solid units.
 - .2 Use grout to CSA A179 where grout is used in lieu of solid units.

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- .3 Install building paper below voids to be filled with concrete or grout; keep paper 25 mm (1") back from faces of units.

- .6 Provision for Movement:
 - .1 Leave 12 mm (½") space below shelf angles.
 - .2 Leave minimum 19 mm (¾") mm space or as indicated on Drawings between top of non-load bearing walls and partitions and structural elements. Do not use wedges.
 - .3 Built masonry to tie in with stabilizers, with provision for vertical movement.

- .7 Loose Steel Lintels:
 - .1 Install loose steel lintels. Centre over opening width.

- .8 Control Joints:
 - .1 Construct continuous control joints as indicated.

- .9 Expansion Joints:
 - .1 Build-in continuous expansion joints as indicated.

- .10 Site Tolerances:
 - .1 To CSA-A371.

END OF SECTION

MASONRY MORTAR AND GROUT

1. GENERAL

1.1 General Requirements

- .1 Conform to requirements of Section 04051 – Masonry Procedures.

1.2 Quality Control

- .1 Do mortar and grout work in accordance with CSA A179 except where specified otherwise.
- .2 Use same brands of materials and source of aggregate for entire project.
- .3 Irregularity in mortar joints for wall faces exposed or painted in the completed work: Not be noticeable when viewed from a distance of 4500 mm (15'-0").

2. PRODUCTS

2.1 Materials

- .1 Use same brands of materials and source of aggregate for entire project.
- .2 Colour additives: Non-staining, non-fading, ground coloured natural aggregates or metallic oxide pigments.
- .3 Aggregate: CSA A179, except that the maximum allowable percentage passing 600 µm (No. 30) sieve shall be 80% and maximum passing 300 µm (No. 50) sieve shall be 50%.
- .4 Cement: Normal Portland, CAN/CSA-A5.
- .5 Hydrated Lime: ASTM C207; Type S.
- .6 Integral Water Repellent Admixture For Exterior Concrete Masonry Units and Concrete Mortar: Liquid polymeric admixture mixed with concrete during manufacture of concrete masonry units and added to mortar during mortar mixing in accordance with Manufacturer's recommendations. Integral water repellent admixture system shall provide Class E Rating when tested in accordance with ASTM E514. Dry Block System by WR Grace.

2.2 Mortar Types

- .1 Mortar for interior and exterior masonry above grade: CSA A179.
 - .1 Non-Loadbearing: Type N.
- .2 Mortar for Stone Masonry Units: 1 part Portland cement, 1 part hydrated lime, 6 parts aggregate by volume.
- .3 Grout: CSA A179, Table 3.

MASONRY MORTAR AND GROUT

- .4 Parging Mortar: Type N.

2.3 Mixes

- .1 Measure and mix mortar materials based on CSA A179 Proportion Specifications.
- .2 Use Portland cement in mortar for exterior masonry work and masonry cement for interior masonry work.
- .3 Incorporate admixtures into mixes in accordance with Manufacturer's instructions.
- .4 Do not mix different types of mortar or grout in the same mixer unless the mixer is thoroughly cleaned first.
- .5 Type N Mortar: At Contractor's option, one of the following:
 - .1 Pre-mixed mortar: CSA A179, Portland cement/lime/aggregate, Type N, by St. Lawrence Cement Company, Canada Cement, St. Mary Cement or Lake Ontario Cement Ltd. Mix, use and store in accordance with Manufacturer's instructions to produce small batches for immediate use only. Discard mixed mortar after 2 hours.
 - .2 Site silo mix: CSA A179, Portland cement/lime/aggregate, Type N, by Mega-Mix Ltd. or Max-Mix Ltd. or Jiffy Concrete Products. Mix required amount from Site silo as required. Take representative samples for testing consistency of strength in accordance with CSA A179. Use mortar within two hours after mixing at temperature of 26°C (79°F), or 2½ hours at temperatures under 10°C (50°F).
- .6 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 nor more than 2 hours then remix with sufficient water to produce mortar of proper consistency for pointing.
- .7 Coloured Mortars: Use clean mixer for coloured mortar. Use colour additives not exceeding 10% of cement content by mass to produce coloured mortar to match architectural concrete block units.

3. EXECUTION

3.1 Application

- .1 Do masonry mortar and grout work in accordance with CSA A179 except where specified otherwise.
- .2 Parging: Apply parging in uniform coating not less than total 10 mm (d") thick.

3.2 Repointing

- .1 Repoint defective joints.

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- .2 Cut back joints 13 mm ($\frac{1}{2}$ ") taking care not to damage units. Remove dust and loose materials by brushing or by water jet. If water jet is used, allow excess water to drain before repointing.
- .3 Repoint with same mix and colour as original.
- .4 Pack mortar tightly in thin layers, and tool joint to match non defective joints.

END OF SECTION

MASONRY REINFORCEMENT AND CONNECTORS

1. GENERAL

1.1 General Requirements

- .1 Conform to requirements of Section 04051 – Masonry Procedures.

1.2 Source Quality Control

- .1 Upon request, provide Contract Administrator with certified copy of mill test report of reinforcement steel and connectors, showing physical and chemical analysis, minimum twenty five (25) calendar days prior to commencing reinforcement work.

2. PRODUCTS

2.1 Materials

- .1 Acceptable Products: Subject to compliance with requirements of this Section, products that may be incorporated into the Work include, but are not limited to, the products specified. Products by other manufacturers similar in function, design, performance, and construction may be used subjected to Contract Administrator's prior acceptance.
- .2 Corrosion Protection: Steel reinforcing, ties, anchors and connectors and fasteners.
- .1 Interior Side of Building Air Barrier: Hot dipped galvanized after fabrication to ASTM A153 B2 coating weight 457 gm/m² (1.5 oz/ft²).
- .2 Exterior Side of Building Air Barrier and Parts of Exterior Wall: Type 304 stainless steel, ASTM A167 for plates, ASTM A580 for wires.
- .3 Reinforcing Bar: CSA G30.18, Grade 400, deformed billet steel bars.
- .4 Horizontal Reinforcement for Single Wythe Masonry: CSA A371, truss design, 3.66 mm stainless steel longitudinal and diagonally formed cross wires, DA3100 by Dur-O-Wal Limited or BL30 by Blok-Lok Limited. Width of reinforcing unit shall be 50 mm less than the nominal thickness of the wall. Provide prefabricated corners and tees.
- .5 Horizontal Reinforcement for Multi-Wythe Masonry: CSA A371, truss design, 3.66 mm stainless steel longitudinal and diagonally formed cross wires, 4 wire design. Width of reinforcing unit shall be 50 mm less than the nominal thickness of the wall. Provide prefabricated corners and tees.
- .6 Top of Partition Lateral Supports: 10 mm (³/₈) steel dowel welded to 2.75 mm (12 gauge) steel base plate with adjustment slots, hot dip galvanized, complete with dowel plastic sleeves and attaching hardware, Masonry Wall-Top Stabilizing Anchor by Dur-O-Wal. Supply and install horizontal soft joint continuously between top of masonry and underside structure. Soft Joint to be closed cell neoprene material conforming to ASTM D1056 class RE 41.

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- .7 Supply and Install stainless steel wall ties for all concrete masonry wall ends abutting concrete wall and column structure. Wall ties to be site installable and anchored to concrete structure with accepted stainless steel concrete anchors, Adjustable Wall Tie D/A 210 50 mm x 200 mm long by Dur-O-Wal.

3. EXECUTION

3.1 Installation

- .1 Do work in accordance with CSA-A370, CSA-A371, and CSA-S304.1 unless indicated otherwise.
- .2 Prior to placing concrete or grout, obtain Contract Administrator's approval of placement of reinforcement and connectors.
- .3 Reinforce masonry walls and partitions with continuous reinforcement in every second block. Provide continuous reinforcing. In cavity wall extend reinforcing from interior masonry, spanning over cavity, into masonry veneer facing.
- .4 Adjustable masonry reinforcement not permitted to correct poorly laid masonry. Bending of masonry reinforcement or ties not permitted.
- .5 At corners of openings provide extra reinforcement, so that first and second courses above and below openings are reinforced. Extend extra reinforcement 600 mm beyond opening in each direction.
- .6 Concrete Wall Backups: Space anchors at maximum 600 mm (24") each direction, aligned vertically and horizontally.
- .7 Apply insulation retainer at each ties progressively as cavity wall insulation is installed. Ensure retainer presses insulation in tight and firm contact with wall.
- .8 Top of Partition Lateral Supports: Mechanically anchor or weld supports to underside of structure, engage supports in full mortar in grooves in sash blocks or head joints. Space supports at 1800 mm (6'-0") oc.

3.2 Field Touch-Up

- .1 Touch up damaged and cut ends of galvanized reinforcement steel and connectors with compatible finish to provide continuous coating.

END OF SECTION

MASONRY ACCESSORIES

1. GENERAL

1.1 General Requirements

- .1 Conform to requirements of Section 04051 – Masonry Procedures.

2. PRODUCTS

2.1 Materials

- .1 Acceptable Products: Subject to compliance with requirements of this Section, products that may be incorporated into the Work include, but are not limited to, the products specified. Products by other manufacturers similar in function, design, performance, and construction may be used subject to Contract Administrator's prior acceptance.
- .2 Control Joint Filler: Purpose-made, rubber, size and shape to suit end use as recommended by manufacturer, Rubber Control Joint by Dur-O-Wal.
- .3 Dampproof Course and Flashing: Self-adhering modified bitumen membrane reinforced with proprietary polymer facing, minimum thickness 1 mm (40 mils), complete with manufacturer recommended primer and lap adhesive.

3. EXECUTION

3.1 Installation – Control Joints And Expansion Joints

- .1 Control Joints: Provide control joint fillers in interior and exterior masonry walls as indicated on Drawings and where wall height changes; where wall direction changes; where wall thickness changes; at pipe and column chases; at bond beam breaks; at abutments of columns and walls; at abutment of cold walls to warm walls; at openings in walls such as doors and windows; and at intervals in continuous walls as follows:
 - .1 Up to 2400 mm (8') high: 9000 mm (30') to 10500 mm (35') oc.
 - .2 2400 mm (8') to 3600 mm (12') high: 10500 mm (35') to 12000 mm (40') oc.
 - .3 Over 3600 mm (12') high: 12000 mm (40') to 13500 mm (45') oc.
- .2 Expansion Joints: Provide expansion joints within wall construction in locations indicated on Drawings. Provide joints to receive sealants specified in Section 07900 – Joint Sealant.

3.2 Installation – Dampproof Course And Flashing

- .1 Install dampproof courses and flashings where indicated on Drawings. If not fully indicated, install in the following locations

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- .1 Interior Walls on Slabs on Grade: Below first masonry course, full thickness of wythe.
- .2 Intersection of Masonry Walls With Roofs or Other Exterior, Horizontal Surfaces: Immediately above roof flashing or horizontal surface flashing and seal to roof, horizontal flashing and air barrier.
- .3 Wall Openings: Install work over openings in walls, extend past opening minimum of 200 mm (8") and turn up minimum 150 mm (6") at each end to create waterproof dam to prevent water draining into openings.

END OF SECTION

CONCRETE MASONRY UNITS

1. GENERAL

1.1 General Requirements

- .1 Conform to requirements of Section 04051 – Masonry Procedures.

2. PRODUCTS

2.1 Materials

- .1 Use normal weight concrete masonry units where finished face exposed to exterior or to earth below grade, or forming part of an exterior wall.
 - .1 S or SC/15/A/M: Solid block walls exposed to weather, and for other load bearing walls indicated.
 - .2 H/15/A/M: Locations where structural members bear on concrete block, and where indicated on Drawings: Fill units solid for top 2 courses of load bearing walls.
- .2 Where concrete masonry walls are required to act as fire separations or barriers, provide units conforming to the building code with respect to classification, thickness, fire resistant ratings and type of concrete.
- .3 Special Shapes: Provide bull-nosed and double bull nosed units for exposed corners. Provide purpose-made shapes for lintels and bond beams. Provide additional special shapes as indicated.

2.2 Concrete Masonry Units

- .1 Standard Concrete Block Units: CAN3-A165 Series, modular size.
- .2 Architectural Concrete Block Units: CAN3-A165 Series, modular size, integral water repellent treated to yield resistance to water penetration for 62 hours when tested to ASTM E514, No. 305 Charcoal Smooth Face by CCI Industries.

3. EXECUTION

3.1 Installation - Concrete Masonry Units

- .1 Lay block to align plumb over each other with thick ends of webs up. Leave no cells open in exposed work.
- .2 Minimize cutting block. Cut exposed block with power driven abrasive cutting disc or diamond cutting wheel where cutting is required and for flush mounted electrical outlets, grilles, pipes, conduit, leaving 3 mm (c”) maximum clearance.

CONCRETE MASONRY UNITS

- .3 Do not wet concrete masonry before or during laying in wall.
- .4 Bond:
 - .1 Stack Bond: Align joints plumb over each other in every course.
- .5 Buttering corners of units, throwing mortar droppings into joints, deep or excessive furrowing of bed joints will not be permitted. Do not shift or tap units after mortar has taken initial set. Where adjustment must be made after mortar has started to set, remove mortar and replace with fresh supply.
- .6 Lay all joints approximately 10 mm (d") thick unless otherwise specified or otherwise indicated on Drawings. Fill joints full of mortar except where specifically designated to be left open.
- .7 Jointing: When mortar is thumb print hard, tool joints slightly concave for exposed work; elsewhere, strike joints flush. Use sufficient force to press mortar tight against masonry units on both sides of joints. Remove excess material or burrs left after jointing. Use trowel or rub with burlap bag.
- .8 Locate corners accurately.
- .9 Use bullnose and double bullnose block at sills and all external corners from second bottom course to top of partition where block is left exposed.
- .10 Use square nose units at bottom course at external corner. Grind smooth corners to match bullnose units above, from top of flooring base.
- .11 Use full bed of mortar for first course. For remaining courses bed face shells and cross and end webs and vertical end joints fully in mortar. Compress end joint mortar.
- .12 Bond intersecting block walls in alternate courses with metal anchors. Where blockwork abuts concrete, bond each block course with site installed anchors.
- .13 Do not break bond of walls of exposed units where partitions intersect and if bonding would show through on exposed face of walls. Bond these partitions, to walls they intersect, with prefabricated intersection masonry anchor reinforcement in each course.

3.2 Non-Load Bearing Partitions

- .1 Non-Loading Bearing Partitions: Extend partitions in areas without suspended ceilings and other partitions indicated on Drawings, up through ceiling to structure above, unless indicated or specified otherwise: Terminate partitions minimum 19 mm (¾") or as shown on Drawings, below structure and fill space between top of masonry and structure with compressible packing insulation.
- .2 Terminate remainder of masonry partitions minimum of 100 mm (4") above finished suspended ceilings.

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3.3 Multi-Wythe Composite Walls

- .1 Bond wythes of composite masonry together using reinforcement installed in horizontal mortar joints.
- .2 Collar Joints: Solidly fill collar joints by parging face of first wythe that is laid in shoving units of other wythe into place.
- .3 Corners: Provide interlocking masonry unit bond in each wythe sand course at corners, unless otherwise indicated.
- .4 Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture bond walls together as follows:
 - .1 Provide continuity with masonry joint reinforcement by using prefabricated T-shaped units.
 - .2 Provide rigid metal anchors not more that 600 mm o.c. If used with hollow masonry units, embed ends in mortar-filled cores.

3.4 Installation - Concrete Block Lintels

- .1 Install reinforced concrete block lintels over openings in masonry where steel or reinforced concrete lintels are not indicated.
- .2 End bearing: Not less than 200 mm (8").

3.5 Cleaning

- .1 Standard and Architectural Units: Allow mortar droppings on masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of block and finally by brushing.
- .2 Pointing: Clean block faces using soft cloths before mortar hardens rake to 10 mm (3/8"). After completion of block laying fill joints with pointing mortar then point to provide concave joints. Repeat cleaning of faces.

END OF SECTION

STONE MASONRY UNITS

1. GENERAL

1.1 General Requirements

- .1 Conform to requirements of Section 04051 – Masonry Procedures.

2. PRODUCTS

2.1 Materials

- .1 Acceptable Products: Subject to compliance with requirements of this Section, products that may be incorporated into the Work include, but are not limited to, the products specified. Products by other manufacturers similar in function, design, performance, and construction may be used subject to Contract Administrator's prior acceptance.
- .2 Stone, General: Hard, durable, well seasoned and of uniform strength, colour and texture, free of harmful quantities of radiation, or other mineral or organic defects.
 - .1 Limestone: ASTM C568, smooth face, 3 course ashlar, random lengths and no continuous horizontal joint heights, 90 to 100 mm bed thickness, 200 mm course heights, Tyndall Limestone buff colour by Gillis Quarries Limited.

3. EXECUTION

3.1 Installation

- .1 Clean stone by washing with water before laying.
- .2 Lay heavy stones and projecting stones after mortar in courses below has hardened sufficiently to support weight.
- .3 Prop and anchor projecting stones until wall above is set.
- .4 Set large stones on water soaked softwood wedges to support stone in proper alignment until mortar has set. Remove wedges when dry, do not break off, grout holes with matching mortar.
- .5 Remove mortar droppings and splashings from face of stone before mortar is set. Sponge stone free of mortar along joints as work progresses.
- .6 Tool joints after initial set has occurred to concave finish.
- .7 Arrange random coursed ashlar stone pattern so that no vertical joint is higher than highest course height being used, no horizontal joint is more than five stones long and no two stones of same height are placed end to end. End stones 100 mm long.

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3.2 Cleaning

- .1 After mortar has completely set brush stone work with stiff brush using mild alkaline abrasive cleaner that contains no caustic or harsh fillers.
- .2 Rinse with clear water to remove foreign matter.

END OF SECTION