

MASONRY PROCEDURES

1. GENERAL

1.1 Quality Assurance

- .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 Coloured Mortar: 150 mm (6") long.
 - .5 Masonry Reinforcement, Ties and Corners: 300 mm (12") long, or full size sample.

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 Delivery, Storage, and Handling

- .1 Deliver materials to 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.

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1.5 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)

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.

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- .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.
 - .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 ($\frac{1}{2}$ ”) space below shelf angles.
 - .2 Leave minimum 19 mm ($\frac{3}{4}$ ”) 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 Cavity Walls
 - .1 Construct cavity walls with cavity free of mortar. Strike mortar joints in both wythes flush at cavity faces.
- .9 Control Joints:

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- .1 Construct continuous control joints as indicated.
- .10 Expansion Joints
 - .1 Build-in continuous expansion joints as indicated.
- .11 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 Assurance

- .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 Work.
- .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 Colour Additives: Non-staining, non-fading, ground coloured natural aggregates or metallic oxide pigments.
- .2 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%.
- .3 Cement: Normal Portland, CAN/CSA-A3000, Type GU.
- .4 Hydrated Lime: ASTM C207; Type S.
- .5 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 Loadbearing: Type S.
 - .2 Non-Loadbearing: Type N.
- .2 Mortar for Stone Masonry Units: 1 part Portland cement, 1 part hydrated lime, 6 parts aggregate by volume.

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- .3 Non-Staining Mortar: Use non-staining masonry cement for cementitious portion of specified mortar type.
- .4 Grout: CSA A179, Table 3.
- .5 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 two (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 Coloured Mortars: Use clean mixer for coloured mortar. Use colour additives not exceeding 10% of cement content by mass, or integrally coloured masonry cement, to produce coloured mortar to match approved sample.
 - .1 Architectural Block Mortar: Colour to match architectural blocks.
- .7 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.

MASONRY MORTAR AND GROUT

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 ($\frac{3}{8}$ ") thick.

3.2 Repointing

- .1 Repoint defective joints.
- .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, 3.66 mm steel longitudinal and cross wires, DA3200 by Dur-O-Wall Limited or BL10 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 Cavity Wall Ties, Concrete Block Back Up: Engineered ties, properly sized, consisting of 1.6 mm (0.060") thick stainless steel connector plate, 4.76 mm (0.19") diameter stainless steel v ties, and polyethylene insulation support, Block Shear Connector by Fero Corp.
 - .1 Concrete Block Back Up Wythe: Two wire ladder horizontal reinforcing of 3.66 mm diameter stainless steel side and cross wires.
- .6 Cavity Wall Ties, Concrete Back Up: Engineered ties, properly sized, consisting of 1.6 mm (0.060") thick stainless steel L plate, 4.76 mm (0.19") diameter stainless steel v ties, and polyethylene insulation support, Heavy Duty Rap-Tie by Fero Corp.

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- .7 Top of Partition Lateral Supports: 10 mm ($\frac{3}{8}$) 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.

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 Cavity Wall Ties, Concrete Block Back Up: Space ties at 800 mm (32") horizontally and 400 mm (16") vertically. Place horizontal reinforcing in back up wythe 400 mm (16") vertically in alternatives course to ties.
- .8 Apply insulation retainer at each ties progressively as cavity wall insulation is installed. Ensure retainer presses insulation in tight and firm contact with air barrier.
- .9 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 040511 – 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 subjected to Contract Administrator's prior acceptance.
- .2 Control Joint Filler: Purpose-made, rubber, size and shape to suit end use as recommended by manufacturer, Rapid 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, compatible with air barrier system specified in Section 07270 – Air Barriers, Bueskin TWF Flashing System by Bakor.
- .4 Weep Hole Vent: Cellular plastic, one-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of mortar joint and depth 3 mm ($\frac{1}{8}$ "') less than depth of outer wythe, in color selected from manufacturer's standard.
- .5 Mortar Dropping Control Device: Mor-Control by Dur-O-Wal, full thickness of cavity wall air space.

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.

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- .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 - Weep Hole Vents

- .1 Install weep hole vents in vertical joints immediately over flashings, in exterior wythes of cavity wall and masonry veneer wall construction, at maximum horizontal spacing of 600 mm (24") oc.
- .2 Ensure that holes in vents are not plugged with mortar or debris.
- .3 At walls higher than 2.8 m, provide second course at 2.8 m centres.

3.3 Installation – Dampproof Course And Flashing

- .1 Install dampproof courses and flashings where indicated on Drawings. If not fully indicated, install in the following locations
 - .1 Exterior Walls, General: Install flashings and dampproofing courses to provide continuous waterproofing flashing.
 - .2 Interior Walls on Slabs on Grade: Below first masonry course, full thickness of wythe.
 - .3 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.
 - .4 Cavity Walls: Full thickness of exterior wythe, horizontally across cavity and through insulation to terminate shingle style with minimum 150 mm (6") vertical leg behind air barrier. Maintain integrity of air barrier without damaging flashing, membrane and insulation.
 - .5 Non-Cavity Wall: Full thickness of wall.
 - .6 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.

3.4 Installation – Mortar Dropping Control Devices

- .1 Place mortar dropping control device in air space of cavity walls horizontally starting 200 mm (8") above the damp proof course and extended full height of wall. Space devices at maximum 800 mm (32") horizontally and 400 mm (16") vertically. Stagger 50% on the horizontal joint from the previous unit.
 - .1 Ensure mortar droppings are kept to a minimum and do not bridge air space as wythe is erected.

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, .#305 Charcoal Smooth Face by CCI Industries.
- .3 Acoustical Blocks: CAN3-A165 Series, modular size, purpose made with slots to provide the acoustical characteristics specified.
 - .1 Noise Reduction Coefficients (NRC): 0.85 for 290 mm wide units with slots and cavities with noncombustible fibrous filler elements when surface painted before testing.

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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 ($\frac{1}{8}$ "") maximum clearance.
- .3 Do not wet concrete masonry before or during laying in wall.
- .4 Bond:
 - .1 Running Bond: Stagger end joints in every course. Align joints plumb over each other in every other course.
 - .2 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 ($\frac{3}{8}$ "") 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 dovetail anchors.

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- .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 Interior Load Bearing And Non-Load Bearing Partitions

- .1 Load Bearing Walls: Carry load bearing partitions to structure above, wedge and grout.. Rake out full mortar joint between partition and structure for a depth of 13 mm ($\frac{1}{2}$ ") on 1 side for sealing specified under Division 7 Section 07900 – Joint Sealants. Rake joint shall be on side of suspended ceiling (if any). If no ceiling then on side as directed.
- .2 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 ($\frac{3}{4}$ ") or as shown on Drawings, below structure and fill space between top of masonry and structure with compressible packing insulation.
- .3 Terminate remainder of masonry partitions minimum of 100 mm (4") above finished suspended ceilings.

3.3 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").

3.4 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 ($\frac{3}{8}$ "). After completion of block laying fill joints with pointing mortar then point to provide concave joints. Repeat cleaning of faces.

END OF SECTION