

DIVISION 04

MASONRY

Part 1 General

1.1 RELATED SECTIONS

- .1 Masonry work and materials specified under related sections in Division 4 - Masonry.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A179-04(R2014), Mortar and Grout for Unit Masonry.
 - .2 CAN/CSA-A371-14, Masonry Construction for Buildings.

1.3 DELIVERY, STORAGE AND HANDLING

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

1.4 ENVIRONMENTAL REQUIREMENTS

- .1 Cold weather requirements:
 - .1 Supplement CAN/CSA-A371 with following requirements:
 - .1 Maintain temperature of mortar between 5°C and 50°C until batch is used or becomes stable.
 - .2 Maintain ambient temperature between 5°C and 50° C and protect site from wind chill.
 - .2 Maintain dry beds for masonry and use dry masonry units only. Do not wet masonry units in cold weather.
 - .3 When air temperature is below -4°C protect and heat masonry to maintain air temperature above 0°C on both sides of walls during operations and for period of 24 hours after.
 - .4 When air temperature is above -4°C erect windbreaks to prevent differential freezing of walls.
- .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 flashing or other permanent construction.

Part 2 Products

2.1 MATERIALS

- .1 Use same brands of materials and source of aggregate for entire project.

Part 3 Execution

3.1 PREPARATION

- .1 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

3.2 INSTALLATION

- .1 Do masonry work in accordance with CAN/CSA-A371 except where indicated otherwise.
- .2 Build masonry plumb, level, and true to line, with vertical 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.
- .4 Make masonry courses uniform in height with both vertical and horizontal joints of equal and uniform thickness.
- .5 Lay masonry units in full mortar bed. Do not shift or tap units after mortar has taken initial set. Where adjustments must be made, remove mortar and replace with fresh supply.
- .6 Bed joints evenly and fill solidly with mortar. Rock masonry into place at closures with head joints thrown against adjacent masonry units.
- .7 Where new masonry abuts set masonry, clean existing surfaces and dampen if necessary to obtain bond.

3.3 CONSTRUCTION

- .1 Exposed masonry:
 - .1 Remove chipped, cracked, and otherwise damaged units in exposed masonry and replace with undamaged units.
- .2 Jointing:
 - .1 Allow joints to set just enough to remove excess water, then tool with jointer to provide smooth, compressed, uniform joints.
 - .2 Use round jointer to provide concave joints where concave joints are exposed or scheduled for paint or other thin finish coating.
 - .3 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.
 - .4 Point or replace defective mortar as required or where directed by Contract Administrator.
- .3 Cutting:
 - .1 Cut out neatly for electrical switches, outlet boxes, and other recessed or built-in objects.
 - .2 Make cuts straight, clean, and free from uneven edges.
 - .3 Use masonry saw where necessary.
- .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 grout to CAN/CSA-A179 where grout is used in lieu of solid units.
 - .2 Install building paper below voids to be filled with grout; keep paper 25 mm back from faces of units.
- .6 Provision for movement:
 - .1 Leave 9 mm space below shelf angles to allow for movement.
 - .2 Leave space between top of non-load bearing walls and partitions and structural elements, minimum 25 mm or as indicated on drawings. Do not use wedges.
 - .3 Built masonry to tie in with stabilizers, with provision for vertical movement.
- .7 Provisions for other trades:
 - .1 Provide openings in masonry walls where required or indicated. Accurately locate chases and openings and neatly finish to the required sizes.
 - .2 Where masonry encloses conduit or piping, bring to proper level indicated and as directed.
 - .3 Do not cover pipe or conduit chases or enclosures until advised that work has been inspected and tested.

3.4 SITE TOLERANCES

- .1 Tolerances in notes to CAN/CSA-A371 apply.

3.5 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.6 PROTECTION

- .1 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A179-14, Mortar and Grout For Unit Masonry.

Part 2 Products

2.1 MATERIALS

- .1 Use same brands of materials and source of aggregate for entire project.
- .2 Mortar and grout: CAN/CSA-A179.
- .3 Grout: to CAN/CSA-A179, Table 3.
- .4 Use aggregate passing 1.18 mm sieve where 6 mm thick joints are indicated.
- .5 Non-staining mortar: use non-staining masonry cement for cementitious portion of specified mortar type.
- .6 White mortar: use white silica sand and white masonry cement white Portland cement, and lime to produce applicable mortar type.

2.2 MORTAR TYPES

- .1 Mortar for exterior masonry above grade:
 - .1 Loadbearing: Type S based on Proportion specifications.
 - .2 Non-loadbearing: Type N based on Proportion specifications.

2.3 MIXING

- .1 Mix grout to semi-fluid consistency.
- .2 Pointing mortar: pre-hydrate 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.

Part 3 Execution

3.1 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.

3.2 CONSTRUCTION

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

3.3 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.4 SCHEDULE

- .1 Use non-staining mortar for limestone.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CAN/CSA-A179-14, Mortar and Grout For Unit Masonry.
 - .3 CAN/CSA-A370-14, Connectors for Masonry.
 - .4 CAN/CSA-A371-14, Masonry Construction for Buildings.
 - .5 CSA G30.3 Cold-Drawn Steel Wire for Concrete Reinforcement.
 - .6 CSA G30.14-M1983 Formed Steel Wire For Concrete Reinforcement.
 - .7 CSA G30.18-09 (R2014) Billet-Steel Bars for Concrete Reinforcement.
 - .8 CSA-S304.1, Design of Masonry Structures.
 - .9 CSA-W186 Welding of Reinforcing Bars in Reinforced Concrete Construction.

Part 2 Products

2.1 REINFORCEMENT

- .1 Bar reinforcement: to CAN/CSA-A371 and CSA G30.18, Grade 400.
- .2 Wire reinforcement: to CAN/CSA-A371 and CSA G30.14 ladder or truss type. Include prefabricated corners and intersections.
- .3 Corrosion protection: to CSA-S304.1, galvanized to CAN/CSA-A370.

2.2 CONNECTORS

- .1 Connectors: to CAN/CSA-A370 and CSA-S304.1.
 - .1 Exterior masonry veneer on wood stud backup walls: connector assembly consisting of galvanized steel connector plate and V-tie and plastic insulation support.
 - .1 Acceptable material: Fero Rap-Tie System.
- .2 Corrosion protection: to CSA-S304.1 galvanized to CAN/CSA-A370.

2.3 FABRICATION

- .1 Fabricate reinforcing in accordance with CAN/CSA-A23.1 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Ontario.
- .2 Fabricate connectors in accordance with CAN/CSA-A370.
- .3 Obtain Contract Administrator's approval for locations of reinforcement splices other than shown on placing drawings.
- .4 Upon approval of Contract Administrator, weld reinforcement in accordance with CSA-W186.
- .5 Ship reinforcement and connectors, clearly identified in accordance with drawings.

Part 3 Execution

3.1 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.

3.2 GENERAL

- .1 Supply and install masonry connectors and reinforcement in accordance with CAN/CSA-A370, CAN/CSA-A371, CAN/CSA-A23.1 and CSA-S304.1, except where indicated otherwise.
- .2 Supply and install additional reinforcement to masonry as indicated.

3.3 BONDING AND TYING

- .1 Bond walls of two or more wythes using metal connectors in accordance with NBC, CSA-S304.1, CAN/CSA-A371 and as indicated.
- .2 Tie masonry veneer to backing in accordance with NBC, CSA-S304.1, CAN/CSA-A371 and as indicated.
- .3 Coordinate spacing of masonry ties with installation of cavity wall insulation to ensure connector plates are centered on horizontal joints of insulation boards.
- .4 Ensure fasteners are tight and secure. Remove and replace any stripped or loose fasteners.
- .5 Install plastic insulation supports over connector plates to hold insulation tight to backup walls. Provide one insulation support at each connector plate. Ensure tight fit.

3.4 REINFORCED LINTELS AND BOND BEAMS

- .1 Reinforce masonry lintels and bond beams as indicated.
- .2 Place and grout reinforcement in accordance with CSA-S304.1, CAN/CSA-A371, and CAN/CSA-A179.

3.5 GROUTING

- .1 Grout masonry in accordance with CSA-S304.1, CAN/CSA-A371 and CAN/CSA-A179 and as indicated.

3.6 ANCHORS

- .1 Supply and install metal anchors as indicated.

3.7 LATERAL SUPPORT AND ANCHORAGE

- .1 Supply and install lateral support and anchorage in accordance with CSA-S304.1 and as indicated.

3.8 MOVEMENT JOINTS

- .1 Reinforcement will not be continuous across movement joints unless otherwise indicated.

3.9 FIELD BENDING

- .1 Do not field bend reinforcement and connectors except where indicated or authorized by Contract Administrator.
- .2 When field bending is authorized, bend without heat, applying a slow and steady pressure.
- .3 Replace bars and connectors that develop cracks or splits.

3.10 FIELD TOUCH-UP

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 07 92 00 - Joint Sealing: sealants and joint fillers.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A371-14, Masonry Construction for Buildings.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.32, Sheathing, Membrane, Breather Type.

Part 2 Products

2.1 MATERIALS

- .1 Control joint fillers and sealants: as specified in Section 07 92 00 - Joint Sealing.
- .2 Mortar net: fabricated of recycled polyester or high-density polyethylene, 90 percent open mesh weave. Complete with bottom strip. Provide in thickness to fit masonry cavity.
 - .1 Acceptable material: Mortar Net.
- .3 Nailing inserts: purpose-made of 0.6 mm thick (24 MSG) galvanized steel inserts for setting in mortar joints.
- .4 Masonry flashing: self-adhesive sheet membrane consisting of rubberized asphalt bonded to high-density polyethylene film, nominal 1.0 mm overall thickness. Use primers and mastic sealants of type recommended by membrane manufacturer.
 - .1 Acceptable material: Grace Perm-A-Barrier Wall Flashing; Bakor Blueskin TWF; Soprema Sopraseal Stick 1100 T.
- .5 Metal drip edge: fabricated of prefinished steel sheet as specified in Section 07 62 00 - Metal Flashing and Trim. Base metal thickness minimum 0.76 mm (22 MSG). Brake formed to profile, with 6 - 9 mm formed drip at front edge, and extending minimum 75 mm under masonry base course.

Part 3 Execution

3.1 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.

3.2 MASONRY FLASHING

- .1 Building flashings in masonry in accordance with CAN/CSA-A371 and as follows.
- .2 Install flashings under exterior masonry bearing on foundation walls, slabs, shelf angles, angle lintels over openings and elsewhere indicated. Install flashings under weep hole courses.

- .3 For self-adhesive membranes clean and prime surfaces to manufacturer's instructions. Place membrane in position without creases, fish mouths, bubbles or wrinkles. Press firmly into place and roll with hand roller to ensure full bond.
- .4 Overlap adjacent pieces 50 mm and roll overlap with hand roller.
- .5 Form end dams at horizontal flashing terminations to prevent water entry.
- .6 Apply a bead of mastic sealant along all laps, seams, top edges, cuts and penetrations and trowel into place.
- .7 At inside and outside corners fold and lap seams. Seal top edge and laps with mastic sealant.
- .8 In cavity walls carry flashings from front of masonry veneer, under outer wythe, then not less than 150 mm up backup wall and seal stop edge with mastic sealant.
- .9 Keep masonry flashing 12 mm back from face of masonry
- .10 Protect masonry flashings from damage from other trades or construction materials until covered.

3.3 METAL DRIP EDGE

- .1 In addition to masonry flashing provide metal drip edge at base course, angle lintels over openings, shelf angles.
- .2 Align drip edge straight and even. Overlap joints minimum 20 mm.

3.4 MORTAR NET

- .1 Install mortar net directly on masonry flashings in cavity walls.
- .2 Lay the first 1 or 2 courses of brick at flashing level, then install mortar net continuously by placing it against the inside of the openings. No fasteners or adhesives are required. Install continuous starter strip, followed by dovetail sections.
- .3 If using multiple thicknesses align the dovetail sections with each other.
- .4 Slightly compress mortar net horizontally so it can be forced into cavities slightly smaller than its nominal thickness without affecting Mortar Net or wall performance. Ensure mortar has set sufficiently to resist outward pressure.
- .5 Avoid contact with wall ties, conduit, plumbing or other materials that bridge or intrude into cavity. Cut out around objects.

3.5 EXPANSION AND CONTROL JOINTS

- .1 Install joint fillers and sealants in expansion and control joints in accordance with Section 07 92 00 - Joint Sealing.

3.6 WEEP HOLES

- .1 Build weep holes in accordance with CAN/CSA A371, supplemented as follows.
- .2 Build weep holes in exterior cavity walls and veneer wall construction by providing weep holes in head joints of first course immediately above masonry flashings or dampproof courses.

- .3 Space weep holes in accordance with CAN/CSA A371 and as follows:
 - .1 For 200 mm length masonry units: 600 mm on centre.
 - .2 For 300 mm length masonry units: 600 mm on centre.
 - .3 For 400 mm length masonry units: 800 mm on centre.
- .4 At narrow openings, such as doors and windows, provide at least 2 weeps holes at each opening.
- .5 Leave out the bottom 50 mm of mortar from head joints. Ensure all mortar is removed to provide clear passage to cavity.
- .6 Keep weep holes free from mortar droppings and debris to allow free air movement and positive drainage of moisture.

3.7 NAILING INSERTS

- .1 Install nailing inserts in mortar joints at 400 mm on centre each way, for attachment of wall strapping.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Division 4 - Masonry: masonry work and materials specified under related sections.

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C568/C568M-10 Standard Specification for Limestone Dimension Stone.
 - .2 CAN/CSA-A371-14, Masonry Construction for Buildings.

Part 2 Products

2.1 MATERIALS

- .1 Limestone: to ASTM C 568, category II, medium density as quarried and supplied by Gillis Quarries Limited, Winnipeg, Manitoba, Canada.
 - .1 Free of defects affecting appearance or durability. Quarry seams shall be well back from finished face. Fossils and other natural markings permitted only to the extent that they do not disfigure finished appearance or durability. Loose or large fossils not permitted.

2.2 ASHLAR STONE

- .1 Limestone masonry units, as described below:
 - .1 Bed Thickness: 90 mm thick;
 - .2 Ashlar Sizes: random lengths, 4 course ashlar pattern, straight coursing, made up in the following coursing heights:
 - .1 Face Height A: 40 mm high.
 - .2 Face Height B: 57 mm high.
 - .3 Face Height C: 90 mm high.
 - .4 Face Height D: 123 mm high.
 - .3 Finish: sawn finish on exposed faces and ends.
 - .4 Colour: grey colour, to match approved sample range.

2.3 FABRICATION

- .1 Cut stone to shape and dimensions; full to square with joints as indicated.
 - .1 Dress exposed faces true.
 - .2 Cut stone to lay on its natural quarry bed.
- .2 Cut-in reglets for flashings where indicated.
- .3 Execute profiled work from full size details and templates.
 - .1 Make exposed arises in true alignment and ease slightly to prevent snipping.
- .4 Back-check stone contacting structural members as indicated.
 - .1 Allow minimum of 25 mm clearance between back of stone and steel and concrete structural members.
 - .2 Shape beds of stone resting on structural work to fit supports.
- .5 Do not cut holes in exposed surfaces.

- .6 Finish exposed faces and edges of stones to comply with requirements indicated for finish and to match approved samples.
- .7 Fabricate units for uniform colouration with adjacent units and over the full area of the installation.
- .8 Cut drip slot in work projecting more than 13 mm. Not less than 6 mm deep; full width of stone.
- .9 Fabricate limestone dimension stone to the following tolerances:
 - .1 Unit length: plus or minus 3 mm.
 - .2 Unit height: plus or minus 3 mm.
 - .3 Deviation from square: plus or minus 3 mm, with measurement taken using the longest edge as the base.
 - .4 Bed depth: plus or minus 3 mm.

Part 3 Execution

3.1 PREPARATION

- .1 Clean stone surfaces by washing with stiff fibre brush and water.
- .2 Apply asphalt emulsion to concrete surfaces, shelf angles, structural steel supports against which stone is to be applied.

3.2 SETTING STONE - GENERAL

- .1 Construction in accordance with CAN/CSA A371.
- .2 Reinforcement and anchorage in accordance with Section 040519 - Masonry Anchorage and Reinforcing.
- .3 Set stones plumb, true, and level, to requirements as indicated.
- .4 Align stone edges and faces according to established relationships and indicated tolerances.
- .5 Provide movement joints of widths and at locations indicated. Keep movement joints free of mortar.

3.3 SETTING STONE WITH MORTAR

- .1 Lay stone in coursed ashlar pattern indicated. Connect stone veneer to structural back-up with masonry ties.
- .2 Set stones in full bed of mortar with vertical joints buttered and placed full.
- .3 Make joints 10 mm thick.
- .4 Place setting buttons or soft-wood wedges under large stones to maintain joint thickness. Set heavy stones and projecting courses after mortar in courses below has hardened sufficiently to support weight.
- .5 Brace and anchor projecting stones until wall above is set.
- .6 Tool joints after initial set has occurred. Tool joints with round jointer to provide smooth, compressed concave joints for all exposed joints.

3.4 CLEANING

- .1 Clean stone as work progresses. Allow mortar droppings on stone to partially dry then remove by means of brushing with a stiff fibre brush.
- .2 Post-Construction: clean exposed stone as specified in Section 04 05 00 – Common Work Results for Masonry.

END OF SECTION