

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 20 00 Concrete Reinforcing
- .2 Section 03 30 00 Cast-in Place Concrete
- .3 Section 04 05 19 Masonry Anchorage and Reinforcing
- .4 Section 04 22 00 Concrete Unit Masonry
- .5 Section 05 50 00 Metal Fabrications
- .6 Section 06 10 00 Rough Carpentry
- .7 Section 07 21 13 Building Insulation
- .8 Section 07 27 13 Modified Bituminous Sheet Air Barriers
- .9 Section 07 92 00 Joint Sealants
- .10 Section 08 11 00 Metal Doors and Frames

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM C90-22 Standard Specification for Loadbearing Concrete Masonry Units
 - .2 ASTM C129-22 Standard Specification for Nonloadbearing Concrete Masonry Units
 - .3 ASTM C207-18 Standard Specification for Hydrated Lime for Masonry Purposes
 - .4 ASTM C216-23 Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)
 - .5 ASTM D2240-15(2021) Standard Test Method for Rubber Property-Durometer Hardness
 - .6 ASTM D5249-10(2021) Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints
- .2 American Concrete Institute (ACI)
 - .1 ACI 530.1-05/ASCE 6-05/TMS 602-05 Specification for Masonry Structures.
- .3 CSA Group (CSA)
 - .1 CSA A82-14 (R2018) Fired Masonry Brick Made from Clay or Shale.
 - .2 CSA A165 Series-14 (R2019) CSA Standards on Concrete Masonry Units.
 - .3 CSA A179-14 (R2019) Mortar and Grout for Unit Masonry
 - .4 CSA A3000-18 Cementitious Materials Compendium
 - .5 CSA A371-14 (R2019) Masonry Construction for Buildings.
 - .6 CSA S304-14 (R2019) Design of Masonry Structures
- .4 Canadian Concrete Masonry Producers Association (CCMPA) Quality Assurance Program.

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit full range of manufacturer's standard colour samples of coloured mortar for selection of colours by the Consultant.
- .3 Data: Submit manufacturer's printed product literature, specifications and data sheets
- .4 Submit the following samples:
 - .1 Two of each type of clay brick masonry units and two concrete masonry units specified.
 - .2 Two of each type of masonry accessory specified.
 - .3 Submit samples of coloured mortar selected by the Consultant.

- .5 Submit shop drawings for all masonry reinforcing. Include placing drawings, bar lists and details. Indicate clearly reinforcing bar sizes, spacing, bending details, lap details, dowels to adjacent construction location and quantities of reinforcement.
- .6 Submit engineered temporary bracing design drawings for temporary support of masonry walls. Drawings shall be prepared by, and bear the seal of a Professional Engineer, licensed in the Province of Ontario.

1.5 Quality Assurance

- .1 The masonry sub-contractor shall have a minimum of five (5) years of continuous documented Canadian experience in work of the type and quality shown and specified. Proof of experience shall be submitted when requested by the Consultant and shall be subject to the approval of the Consultant.
- .2 Mockup
 - .1 Refer to Section 01 45 00 – Quality Control.
 - .2 Prior to proceeding with the work of this section, construct a 1200 mm long x 1000 mm high panel mock-up, to establish for the Consultant's review and acceptance, the general construction and appearance of the installed masonry walls including mortar colours. Mock-up panel shall incorporate each type of masonry unit, use of reinforcement, through wall flashings, air barriers, weep holes, jointing, coursing, mortar and workmanship.
 - .3 Allow 24 hours for inspection of mock-up by Consultant before proceeding with the work.
 - .4 Erect as many panels as are necessary to obtain Consultant's acceptance without additional cost to the Owner. Remove rejected panels from site.
 - .5 Upon the Consultant's acceptance, complete all masonry work in strict accordance with the standards established in the mock-up.
 - .6 The accepted mock-up panel shall remain intact until the work of this Section has been accepted by the Consultant and shall serve as the basis of standard for the work.

1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Materials shall be kept clean and dry.
- .4 Deliver cement, lime and mortar ingredients with manufacturer's seal and labels intact.
- .5 Cementitious material and aggregates shall be stored in accordance with the requirements of CAN A23.1.
- .6 Exposed units which become stained or chipped, surface marked or scratched, and materials which are affected by inadequate protection shall be replaced.
- .7 Masonry units shall be delivered to site in protective film and shall be stored without contact with ground or ground water.

1.7 Cold Weather Requirements

- .1 Provide heat enclosures and heat as required.

.2 Work to be undertaken shall be carried out according to CAN3-A371, Clause 5.15.2.

.3 Maintain temperature of mortar between 5 °C and 50 °C until batch is used.

1.8 Hot Weather Requirements

.1 Protect freshly laid masonry from drying too rapidly by means of waterproof, non-staining coverings.

1.9 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

.1 Concrete Masonry Units:

- .1 Concrete Block: Modular, conforming to CCMPA requirements and CSA A165.
- .2 H/20/A/M concrete masonry units to be used at all multiple wythe exterior walls.
- .3 Special shapes: provide special shapes indicated or required including bullnose and corner blocks, base blocks, fillers, and the like as may be required. Provide purpose made shapes for lintels and bond beams.
- .4 Exposed block shall all be made by one manufacturer and shall be uniform in colour, shade and texture.

.2 Facebrick: burned clay, extruded to CSA A82.1 and ASTM C216, ASW grade.

- .1 Glen-Gery through body brick
- .2 Size: Modular 92 x 57 x 194 mm.
- .3 Colours: Modern gray wirecut (40%), modern gray smooth (10%), French gray wirecut (35%) and French gray smooth (15%).

.3 Masonry Reinforcement: Bar Reinforcement, wire reinforcement and ties: as specified in Section 04 05 19.

.4 Control Joint Filler: to ASTM D5249, Type 1, Round, flexible, continuous-length, nonabsorbent, non-gassing, non-staining, and non-shrinking. Extruded from a cross-linked polyethylene. Flexible foam, heat-Resistant Backer Rod. 9.5 mm thick by width of wall: Sealtight Cera-Rod by W. R. Meadows Canada Limited.

.5 Pre-manufactured Masonry Control Joint: Pre-manufactured polyvinyl chloride control joints may be used in lieu of the specified Built-up type of joint. Control joints as manufactured by the following are acceptable:

- .1 Wall-Tite by Blok-Lok Limited
- .2 Rapid Control Joint- Wide Flange by Dur-O-Wall Limited
- .3 Flexible PVC Masonry Control Joint by Greenstreak

.6 Mortar and Grout:

- .1 Conforming to CSA A179
- .2 Use same brand of material and source of aggregate for entire project.
- .3 Aggregate: CSA A179 coarse sharp clean sand, free from salt, alkaline or other organic substances, specifically graded for masonry use.

- .4 Cement: To CSA A3000, masonry cement. Type S. Blended mixes of Portland cement to CSA A3000 and double hydrated lime to ASTM C207.
 - .5 Water shall be clean, potable and free of deleterious amounts of acid, alkalies, or organic materials.
 - .6 Hydrated Lime: Type 'S' to ASTM C207.
 - .7 Type 'S' mortar shall be used for all masonry work.
 - .8 Proprietary Mortar Mixes: St. Lawrence Cement Company, Blue Circle Cement, Daubois Inc., Lafarge Canada. Mortar mixes shall conform to mix requirements specified.
 - .9 Mortar colour for concrete block masonry work shall be grey.
 - .10 Mortar for facebrick units shall be coloured with ground coloured natural aggregates. Colour will be selected by the Consultant.
 - .1 Coloured mortar: colouring admixture not exceeding 10% of cement content by mass, or integrally coloured masonry cement, to produce coloured mortar to match approved sample.
 - .11 Admixtures of any kind are not allowed except as specified for coloured mortar.
 - .12 Grout: to CSA A179, Table 3.
 - .13 Premixed, non-shrink non-metallic grout: Non Shrink Grout by C.P.D., V3 Grout by W.R. Meadows of Canada, NS Grout by Euclid.
 - .14 Parging Mortar: Type N, to CSA A179.
- .7 Other Materials: all other materials not specifically described but required for a complete and proper installation of masonry, shall be as selected by the Contractor subject to approval by the Consultant.

2.2 Mixes

- .1 Mixing: Prepare and mix mortar materials under strict supervision, and in small batches only for immediate use. Mix proprietary mortars in strict accordance with manufacturer's instructions to produce the specified mortar types in accordance with CSA A179. Do not use retempered mortars.
- .2 Admixtures: in accordance with manufacturer's printed directions.
- .3 Use mortar within 2 hours after mixing at temperatures of 26 °C, or 2-1/2 hours at temperatures under 10 °C.
- .4 Take representative samples for testing consistency of strength and colour according to CSA A179.

2.3 Damp Course and Flashings

- .1 Fully compatible with air barrier membrane specified in Section 07 27 13. Self-adhesive modified SBS bitumen membrane reinforced with proprietary glass screen, minimum thickness of 1.0 mm:
 - .1 Vedagard Non-slip by Bakor Inc.
 - .2 Perm-A-Barrier Wall Flashing by W.R. Grace & Co.
 - .3 Mel-Dek by W.R. Meadows
 - .4 Enverge Flashguard by Firestone.
- .2 Lap Sealant: recommended by flashing manufacturer.
- .3 Surface primers and conditioners as recommended by membrane manufacturer.

2.4 Accessories

- .1 Cavity Vents and Weepholes: purpose made PVC vents, with pest resisting design, size to suit masonry units. Cell-Vent with mortar net, or Mor-Control by Dur-O-Wal Inc. Colour to match mortar colour.
- .2 Cell vents: polypropylene plastic, honeycomb design.
 - .1 Size: to suit.
 - .2 Colour: as selected by Consultant.
- .3 Mortar diverters: shaped and sized to suit cavity spaces.
 - .1 Manufactured from recycled material.
- .4 Grout Screens: 6 mm square monofilament screen fabricated from high-strength, non-corrosive polypropylene polymers to isolate flow of grout in designated areas.
- .5 Mechanical Fasteners: As recommended by manufacturer of material to be fastened, and in accordance with the reference standards, corrosion resistant.
- .6 Packing Insulation: loose glass fibre insulation or mineral wool with minimum density of 17.6 kg/m³.

2.5 Fabrication

- .1 Lintels in non-load-bearing walls shall be constructed with special bond or lintel block units unless shown otherwise on plans. Lintels shall bear 150 mm minimum and bearing shall be isolated with two layers of heavy asphalt coated paper.
- .2 Reinforcing steel in lintels shall be 2 x 20 M bars or as noted on drawings.
- .3 Concrete fill for lintels shall be 20 MPA or as noted on the drawings. Concrete shall be as specified in Section 03 30 00.

PART 3 EXECUTION

3.1 Existing Conditions

- .1 Examine work of other trades for defects or discrepancies and report same in writing to Consultant.
- .2 Installation of any part of this work shall constitute acceptance of such surfaces as being satisfactory.

3.2 General

- .1 Do masonry work in accordance with CSA A371 except where specified otherwise.
- .2 Refer to structural drawings for additional requirements for load bearing masonry walls.
- .3 Build masonry plumb, level and true to line, with vertical joints in alignment.

- .4 Lay out coursing and bond to achieve correct coursing heights and continuity of bond above and below openings, with minimum cutting.
- .5 A competent masonry foreman shall supervise and direct the work and only skilled masons shall execute the work of this Section. The workmanship in construction of exposed masonry walls shall be of highest calibre and first class in all respects.
- .6 Chipped, cracked or stained, and unsatisfactory material or workmanship of all masonry work shall be replaced with undamaged units.
- .7 Co-ordinate work of this Section with others such as, field welding of anchors to steel work, insulation application, installation of conduit and the like. Prepare all items to built-in as the work proceeds, either supplied and installed by other trades or installed under this Section.
- .8 Walls shall be constructed as true planes and when tested with a 3 metre straight edge placed anywhere on the wall in any direction shall be true within 3 mm.
- .9 Variation in the Sizes of Wall Openings: A 6 mm maximum variation is allowed from the actual designated size of wall openings.
- .10 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. Bed and vertical joints shall be evenly and solidly filled with mortar.
- .11 All mortar shall be used and placed in final position within 2 hours of mixing. Mortar not used within this time limit shall be discarded.
- .12 Lay all joints 10 mm thick (uniform) unless otherwise specified or otherwise indicated on drawings. All joints shall be full of mortar except where specifically designated to be left open.
- .13 All joints shall be slightly concave. Use sufficient force to press mortar tight against masonry units on both sides of joints. Remove excess material or burrs left after jointing by means of a trowel or rubbing with burlap bag.
- .14 Coordinate with Electrical and Mechanical trades and set smooth faced block at locations of all outlets, boxes, switches, thermostats and other devices.

3.3 Blockwork

- .1 Provide special shapes and sizes as required such as halves, jambs, lintels, solids, corners, bullnoses and double bullnoses, semi-solids, ashlar, etc.
- .2 Lay block with webs to align plumb over each other with thick ends of webs up.
- .3 Cut exposed block with power driven abrasive cutting disc or diamond cutting wheel for flush mounted electrical outlets, grilles, pipes, conduits, leaving 3 mm maximum clearance.
- .4 Do not wet concrete masonry before or during laying in wall.
- .5 Fill all vertical and bed joints, including plain end faces, through the entire wall thickness solidly with mortar.

- .6 Bond intersecting block walls in alternate courses.
- .7 Provide bullnose block at all exposed masonry corners.
- .8 Provide reinforced bond beams where indicated on structural drawings.
- .9 Provide vertical reinforcement as indicated on structural drawings.
- .10 Where walls are pierced by structural members, ducts, pipes, fill voids with mortar to within 20 mm of such members.
- .11 All exposed interior block corners shall be bullnose.

3.4 Exterior Walls

- .1 Exterior wall construction shall be erected as shown on the drawings of exterior clay brick veneer and concrete block back-up with a nominal 127 mm cavity and 102 mm rigid insulation.
- .2 Veneer in double wythe masonry wall construction shall be tied to block backup together with adjustable truss type masonry reinforcing as specified in Section 04 05 19.
- .3 Bond walls of two or more wythes and tie masonry veneer to backing in accordance with NBC, CSA S304, CSA A371, and as indicated.
- .4 Masonry units shall be laid up in running bond unless indicated otherwise.
- .5 Place continuous dampcourse and flashing membrane at the bottom of all exterior walls, including at bottom of walls and over all openings. Extend flashing from exterior face of exterior wythe, turned up backing face minimum 150 mm and built into the first horizontal block joint or bonded to sheathing with adhesive, unless otherwise indicated. Lap all joints 150 mm and seal with adhesive.
- .6 Jointing: allow joints to dry just enough to remove excess water, then tool with round jointer to provide smooth, compressed, uniformly concave joints.

3.5 Air Barriers and Insulation

- .1 Apply air barriers and insulation over exterior face of concrete block inner wythe as specified in Sections 07 27 13 and 07 21 00. Do not proceed with veneer application until insulation has been inspected and approved.

3.6 Placement – Veneer Wythe

- .1 Use full-size clay brick units without cutting if possible. If cutting is required, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying. Install cut units with cut surfaces concealed.
- .2 Mixing and Blending: mix masonry units within each pallet and with other pallets to ensure uniform blend of colour, size and texture.
- .3 Install brick to patterns shown on the drawings.

- .4 Comply with tolerances in ACI 530.1-05/ASCE 6-05/TMS 602-05.
- .5 Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets.
- .6 Avoid using less-than-half-size units, particularly at corners, jambs, and where possible, at other locations.
- .7 Bond Pattern: Unless otherwise indicated, lay masonry in running bond, do not use units with less than nominal 100 mm horizontal face dimensions at corners or jambs.
- .8 Install reclaimed facebrick at all openings and exposed edges of existing exterior walls where indicated or required to make good damage caused by demolition and removals. Match existing construction including mortar colour.

3.7 Moisture Control

- .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 on centre.
- .2 Mortar diverters: install purpose made diverters in cavities where indicated and as directed, size and shape to suit purpose and function.
- .3 Grout screens: install purpose made diverters in cavities where indicated and as directed, size and shape to suit purpose and function.

3.8 Reinforcement

- .1 Refer to Section 04 05 19 and structural drawings.

3.9 Control Joints

- .1 Provide continuous joints as indicated.
- .2 Joints shall be full height and thickness of wall and shall be 10 mm wide.
- .3 Break vertical mortar bond with extruded neoprene gasket or building paper.
- .4 Prime control joint to prevent drying out of caulking material.

3.10 Concrete Masonry Lintels

- .1 Install reinforced concrete block lintels over openings in masonry walls where steel or reinforced concrete lintels are not indicated.
- .2 End bearing: not less than 200 mm.
- .3 Refer to Section 04 05 19 and drawings.

3.11 Loose Steel Lintels

- .1 Install loose steel lintels. Centre over opening width. Lintel sizes indicated on structural drawings and supplied under Section 05 50 00.

3.12 Grouting

- .1 Grout masonry in accordance with CSA S304 and as indicated.

3.13 Support of Loads

- .1 Use 20 MPa concrete unless specified otherwise on the Drawings, where concrete fill is used in lieu of solid units. Refer to structural drawings.
- .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 grout. Keep paper 25 mm back from face of units.

3.14 Lateral Support and Anchorage

- .1 Refer to Section 04 05 19.

3.15 Temporary Wall Bracing

- .1 Design and provide all required temporary engineered wall bracing.
- .2 Brace masonry walls to resist wind pressure and other lateral loads during construction. Bracing of all masonry walls during construction and prior to completion of supporting structures is a mandatory requirement.

3.16 Built-Ins

- .1 Build in items provided by other Sections, including bearing plates, door frames, anchor bolts, sleeves, inserts and loose steel lintels. Build in items to present a neat, rigid, true and plumb installation. Leave wall openings required for ducts, grilles, pipes and other items.
- .2 Fill voids between masonry and metal frames with masonry mortar or insulation, as indicated on drawings or as required to provide a neat finished appearance.
- .3 Set wall plates on masonry in non-shrink grout in accordance with manufacturer's instructions.
- .4 Do all cutting, fitting, drilling, patching and making good for other trades in masonry work.
- .5 Consultant's approval shall be obtained before cutting.

3.17 Protection

- .1 Keep masonry dry using secure waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from snow, rain and dirt, until masonry work is completed and protected by flashings or other permanent construction.
- .2 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.
- .3 Protect masonry units from damage resulting from subsequent construction operations.
- .4 Use protection materials and methods which will not stain or damage masonry units.

- .5 Remove protection materials upon Substantial Performance of the Work, or when risk of damage is no longer present.

3.18 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Obtain and follow material manufacturer's written instructions for Cleaning. Test sample area, 3.0 m x 3.0 m, to judge effectiveness of cleaning procedures.
- .3 Keep wall clean and free of mortar stains during laying.
- .4 Protect windows, trim and metal.
- .5 Remove mortar with wood paddles and scrapers before wetting. Saturate masonry with clean water and flush off loose mortar and dirt. Clean masonry work using water, scrubbing brushes and wood paddles only.
- .6 Remove mortar from concrete floor slabs and finished surfaces.
- .7 Leave entire area vacuum clean.

End of Section