

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 05 50 00 – Metal Fabrications
- .2 Section 07 21 13 – Board Insulation
- .3 Section 07 27 13 – Modified Bituminous Air and Vapour Barrier
- .4 Section 07 62 00 – Sheet Metal Flashing and Trim
- .5 Section 07 92 00 – Sealants
- .6 Section 08 50 23 – Fibreglass Windows

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A116-11 (2016), Standard Specification for Metallic-Coated, Steel Woven Wire Fence Fabric.
 - .2 ASTM A123/A123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A153/A153M-16a, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - .4 ASTM A167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip (Withdrawn 2014)
 - .5 ASTM A307-14, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
 - .6 ASTM A496/A496M-07, Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement (Withdrawn 2013)
 - .7 ASTM A641/A641M-09a (2014), Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - .8 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .9 ASTM A1011/A1011M-15, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - .10 ASTM B633-15, Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel
 - .11 ASTM C97/C97M-18, Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone.
 - .12 ASTM C99/C99M-15, Standard Test Method for Modulus of Rupture of Dimension Stone.
 - .13 ASTM C119-16, Standard Terminology Relating to Dimension Stone.
 - .14 ASTM C144-17, Standard Specification for Aggregate for Masonry Mortar
 - .15 ASTM C170/C170M-17, Standard Test Method for Compressive Strength of Dimension Stone.
 - .16 ASTM C207-06(2011), Standard Specification for Hydrated Lime for Masonry Purposes.

- .17 ASTM C270-14a, Standard Specification for Mortar for Unit Masonry
- .18 ASTM C568/C568M-15, Standard Specification for Limestone Dimension Stone.
- .19 ASTM C847-14a, Specification for Metal Lath.
- .20 ASTM C933-14, Standard Specification for Welded Wire Lath.
- .21 ASTM C979/C979M-16, Standard Specification for Pigments for Integrally Colored Concrete
- .22 ASTM E488/E488M-15, Standard Test Methods for Strength of Anchors in Concrete Elements
- .23 ASTM F593-17, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
- .24 ASTM F594-09(2015), Standard Specification for Stainless Steel Nuts
- .25 ASTM F738M-02(2008), Standard Specification for Stainless Steel Metric Bolts, Screws, and Studs (Withdrawn 2015)
- .26 ASTM F836M-16e1, Standard Specification for Style 1 Stainless Steel Metric Nuts (Metric)
- .27 ASTM F3125/F3125M-15a, Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions
- .2 Canadian Standards Association (CSA International)
 - .1 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete, Includes Update No.1 (2015).
 - .2 CSA A179-14, Mortar and Grout for Unit Masonry
 - .3 CSA A370-14, Connectors for Masonry.
 - .4 CAN/CSA A371-14, Masonry Construction for Buildings.
 - .5 CSA-A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005), Includes Update No. 1 (2014), Update No. 2 (2014), Updated No. 3 (2014), Update No. 4 (2016).
 - .6 CSA S304-14, Design of Masonry Structures, include Update No. 1 (2015).

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate lines, levels and coursing with work of other Sections.
 - .2 Obtain built-in items prior to start of this work.
- .2 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section and on-site installation, with Contractor, Subcontractor, material supplier and Consultant in accordance with Section 01 31 19 – Project Meetings to:
 - .1 Verify project requirements including specification and details for project.
 - .2 Confirm required mortar, grout and concrete testing; review batch control and grouting procedures.
 - .3 Co-ordination with related Work including, but not limited to, air/vapour membranes and insulation.

- .4 Review cavity drainage requirements and methods for keeping mortar out of cavity spaces.
- .5 Coordinate crack control measures.
- .6 Review requirements for reinforcement at corners and wall intersections.
- .7 Review membranes and membrane flashing materials and details used for construction.
- .8 Confirm trowelled or tooled joints to concealed and exposed masonry faces.
- .9 Review methods for controlling efflorescence during construction.
- .10 Review hot and cold weather requirements.

1.4 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 Provide manufacturer's printed product literature, specifications and data sheet. Indicate masonry types, shapes, sizes, and textures.
 - .2 Cementitious Materials:
 - .1 Include brand, type, and name of manufacturer for site mixed mortar materials.
 - .2 Submit proposed mix proportions and sand analysis reports and compressive strength reports on the proposed mortar mix(es).
- .2 Submit samples in accordance with Section 01 33 00 – Submittals Procedures.
 - .1 Provide 5 stone units showing the range of colour possible within each type specified.
 - .2 Provide sample of masonry connector, joint reinforcement, flashings, weeps and vent.
 - .3 Obtain review comments from Consultant prior to ordering.

1.5 QUALITY ASSURANCE

- .1 Conform to CAN/CSA A371, except as modified by this specification.
- .2 The masonry Subcontractor shall be a member in good standing with the Masonry Contractors Association of Alberta
- .3 The masonry Subcontractor shall have a minimum of five (5) years of experience on projects of similar size and magnitude and shall provide continuous active supervision by a journeyman mason while masonry work is in progress.
- .4 Masonry work shall be performed by experienced, qualified journeyman masons under the direct and continual full-time supervision of certified masons.
- .5 Before starting masonry work establish mix proportions based on the limitations set out in Table 2 of CSA A179.
- .6 Test laboratory prepared samples of the proposed mortar(s) for compressive strength in accordance with CSA A179, by a laboratory approved by the Owner. The Owner will pay for the initial cost of mortar testing. Any re-testing required as a result of the original test failing will be borne by the Contractor.
- .7 Connectors and joint reinforcement shall conform to CSA A370.

- .8 Miscellaneous masonry accessories, and their use where not otherwise specified but shown or required for proper completion of the Work, shall conform to CSA A371.
- .9 Regulatory Requirements: Provide fire resistance rated materials and construction identical to those of assemblies with fire resistance ratings determined by ULC Listings.
- .10 Mock-Ups
 - .1 Construct mock-up in accordance with Section 01 45 00 – Quality Control.
 - .2 Construct a portion of one exterior wall in location agreed upon by Consultant to establish a standard of construction, workmanship, and appearance. Show reinforcement, masonry connectors, flashing, jointing, coursing, mortar, and masonry pattern, unit face alignment, texture, and colour.
 - .3 Do not continue with work of this Section until Consultant has reviewed mock-up.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver masonry units on pallets or cubes, suitably protected from road grime and moisture absorption due to exposure to rain or melting snow.
- .2 Unload and store on dry, level areas, without direct contact with the ground.
- .3 Remove plastic wrappings from concrete masonry units and cover with waterproof coverings which will provide protection from the elements but allow for air circulation.
- .4 Deliver cement, lime, and mortar in dry condition with manufacturer's label intact and store under waterproof cover and protected from elements.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Waste Management and Disposal.

1.8 SITE CONDITIONS

- .1 Ambient Conditions: maintain materials and surrounding air temperature to:
 - .1 Minimum 5 degrees C prior to, during, and 48 hours after completion of masonry work.
 - .2 Maximum 32 degrees C prior to, during, and 48 hours after completion of masonry work.
- .2 Provide adequate bracing for masonry during construction and until permanent lateral supports are in place.

Part 2 Products

2.1 STONE MATERIALS

- .1 Stone :
 - .1 Colour: Black

- .2 Size: 100 mm with 50 mm flagstone cap stones
- .3 Basis-of-Design:
 - .1 Thunderstone Quarry, Cutstone black rundle
- .2 Provide corner units and other accessories for a complete and finished installation. Accessories to match stone wall material.

2.2 MORTAR AND GROUT MATERIALS

- .1 Use same brands of materials and source of aggregate for entire project.
- .2 Cement:
 - .1 Portland Cement: to CAN/CSA-A3000, Type GU - General use hydraulic cement (Type 10) [MS - Moderate sulphate-resistant hydraulic cement (Type 20)] [HE - High-early-strength hydraulic cement (Type 30)] [HS - High-sulphate-resistant hydraulic cement (Type 50)] [MH-Moderate heat of hydration hydraulic cement (Type 40)] [gray] [white] colour.
 - .1 Use low VOC products in compliance with SCAQMD Rule 1168.
 - .2 Masonry Cement: to CAN/CSA-A3002 and CAN/CSA A179, Type N
- .3 Aggregate: supplied by one supplier.
 - .1 Fine Aggregate: to CAN/CSA A179, natural sand.
 - .2 Course Aggregate: to CAN/CSA A179.
- .4 Water: clean and potable.
- .5 Lime:
 - .1 Quick Lime: to CAN/CSA A179.
 - .2 Hydrated Lime: to CAN/CSA A179, Type S
- .6 Mortar Mixes
 - .1 Mortar for exterior masonry above grade:
 - .1 Non-Loadbearing: N based on property specifications.
 - .2 Following applies regardless of mortar types and uses specified above:
 - .1 Mortar for grouted reinforced masonry: type S based on property specifications.
- .7 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 Do not use admixtures, including [pigments,] air entraining agents, accelerators, retarders, water repellent agents, or other admixtures; unless approved in writing by the Consultant.
 - .5 Do not use anti-freeze compounds including calcium chloride or chloride based compounds.
 - .6 Use a batch type mixer in accordance with CAN/CSA A179.

- .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 no more than 2 hours then remix with sufficient water to produce mortar of proper consistency for pointing.
- .8 Re-temper mortar only within two hours of mixing, when water is lost by evaporation.
- .9 Use mortar within 2 hours after mixing at temperatures of 32 degrees C, or 2-1/2 hours at temperatures under 5 degrees C.
- .8 Grout Mixes:
 - .1 Grout: Minimum compressive strength of 20 MPa at 28 days. Maximum aggregate size and grout slump: CAN/CSA A179.
- .9 Grout Mixing:
 - .1 Mix batched and delivered grout in accordance with CAN/CSA-A23.1 transit mixed.
 - .2 Mix grout ingredients in quantities needed for immediate use in accordance with CAN/CSA A179 fine grout.
 - .3 Add admixtures in accordance with manufacturer's instructions; mix uniformly.
 - .4 Do not use calcium chloride or chloride based admixtures.
- .10 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 property specification. Test prior to construction and during 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 property specification. Test prior to construction and during construction for:
 - .1 Compressive strength.
 - .2 Sand/cement ratio.
 - .3 Water content and water/cement ratio.
 - .4 Slump.

2.3 GALVANIZING

- .1 The following galvanizing requirements apply to steel anchors, ties, reinforcing and accessories where requirements are not otherwise specifically listed:
 - .1 Ties and Reinforcing:
 - .1 Mill Galvanized (Interior Use): In accordance with ASTM A116, Class 3.
 - .2 Hot Dip Galvanized (Exterior, including inner wythe of exterior wall construction and High Humidity Use): In accordance with ASTM A153, Class B-2.
 - .2 Hot Dip Hardware and Bolts: In accordance with ASTM A153, Class B-2 regardless of location.
 - .3 Hot Dip Sheet Steel: In accordance with ASTM A653, Coating Designation Z600, regardless of location.
 - .4 Structural Shapes and Pipes: In accordance with ASTM A123, Grade 85, regardless of location.

2.4 REINFORCEMENT

- .1 Bar reinforcement: Steel to CAN/CSA A371 and CAN/CSA G30.18, Grade 400 W.
- .2 Masonry Joint Reinforcement: In accordance with to CSA A371 and ASTM A496, with corrosion protection in accordance with CSA S304 and CSA A370, and as follows:
 - .1 Interior Walls: Mill galvanized, carbon steel.
 - .2 Exterior Walls: Hot dip galvanized, carbon steel.
 - .3 Wire Size for Side Rods: W1.7 or 3.8 mm diameter.
 - .4 Wire Size for Cross Rods: W1.7 or 3.8 mm diameter.
 - .5 Spacing of Cross Rods, Tabs, and Cross Ties: At a maximum of 400 mm o/c.
 - .6 Lengths: A minimum of 3000 mm, with prefabricated corner and tee units.
- .3 Connectors: In accordance with to CSA A370 and CSA S304 with hot dip galvanized finish.
- .4 Single Wythe Masonry Joint Reinforcement: Ladder type with single pair of side rods.

2.5 TIES AND ANCHORS

- .1 Ties and anchors specified in this section shall be designed in accordance with CSA A370 for non-conventional masonry connectors as follows:
 - .1 Deflection: Maximum 2 mm, including free play, when acted upon by a lateral load of 0.45 kN, in all possible positions of adjustment.
 - .2 Positive restraint at position of maximum adjustment.
 - .3 Free play of multi-component ties maximum 1.2 mm when assembled in all possible configurations.
 - .4 Anchors shall allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall.
- .1 Stone / Steel Stud Tie Systems:

- .1 Face of Insulation Mount:
 - .1 Tie Support: Fabricated from steel meeting requirements of CSA A370 and ASTM A1011, hot dip galvanized in accordance with ASTM A123; having pronged legs designed to transfer wind loads to steel stud framing; length to suit total insulation and sheathing thickness.
 - .2 Ties: Wire ties fabricated from steel wire in accordance with CSA G30.18; length to allow for cavity width and to extend minimum 50 mm into masonry unit joint hot dip galvanized in accordance with ASTM A153.
 - .3 Fasteners: Self tapping metal screws to metal stud backup as recommended by tie manufacturer; of sufficient length to penetrate minimum 13 mm into steel stud.
 - .4 Acceptable Materials:
 - .1 Fero Engineered Masonry Technologies, Slotted Rap Tie System
 - .2 Blok-Lok, X-Seal Veneer Anchor
 - .3 Hohmann and Barnard 2 seal Thermal Wing Nut Brick Veneer/Substrate Tie Systems:
- .2 Toggle Bolts: Tumble wing type, class and style as required for supported construction.

2.6 FLASHING

- .1 Metal Flashing: Provide metal flashing materials in accordance with Section 07 62 00.
- .2 Coordinate supply and installation of flexible flashing materials with Section 07 27 13, provide only materials that are compatible with acceptable materials listed in Section 07 27 13 and that form the basis of the contract.
- .3 Butyl Rubber Base Flashing: minimum 1.2 mm thick butyl sheet rubber strips.
- .4 Sheet Steel Base Flashing: minimum 0.60 mm thick, to ASTM A653, formed as detailed, galvanized with Z275 zinc coating.
- .5 Modified Bitumen Base Flashing: SBS modified sheet membrane, minimum 1.0 mm thick self-adhering type or minimum 3.0 mm thick torch-applied type.
- .6 Through Wall and Flexible Flashings: Install flexible membranes where required to maintain flow direction to divert water away from face of building envelope.
 - .1 Acceptable Materials:
 - .1 Bakor Blueskin TWF

2.7 ACCESSORIES

- .1 Firestopping: As specified under Section 07 84 00.
- .2 Sealants: As specified under Section 07 92 00, and as follows:
 - .1 Vertical Sealant: Colour to match stone
 - .2 Horizontal Sealant: Colour to match mortar

- .3 Joint Filler: Control Joint Fillers: Preformed rubber, neoprene or polyvinylchloride, size and profile to suit intended application and as indicated on drawings.
- .4 Bond Breaker Strips: #15 asphalt saturated, organic roofing felt in accordance with CSA A123.3.
- .5 Cavity Drainage Material: Premanufactured cavity insert, sized for width of cavity designed to offset or stagger the accumulation of mortar droppings to reduce risk of clogging vents or weeps:
 - .1 Acceptable Materials:
 - .1 Mortar Net USA, Mortar Net
 - .2 Blok-Lok, Mor-Control
- .6 Cavity wall insulation in accordance with Section 07 21 13.
- .7 Air and vapour barrier membrane in accordance with Section 07 27 13. Coordinate through wall flashings listed in this section with products that form the basis of the contract.
- .8 Metal Lath: Minimum 2.5 lb (3.4 lb for open stud construction) galvanized expanded metal lath (Diamond mesh) in accordance with ASTM C847
- .9 Base and Scratch Coat: Factory pre-mixed, pre-sanded, fiber-reinforced basecoat to comply with ASTM C926.
 - .1 Portland Cement: ASTM C150, Type I or Type III.
 - .2 Lime: ASTM C206, Type S or ASTM C207, special hydrated lime.
 - .3 Sand: to ASTM C897.
 - .4 Fiber Reinforcing: Manufacturer's standard acrylic fibers.

2.8 CLEANING COMPOUNDS

- .1 Use low VOC products in compliance with SCAQMD Rule 1168.
- .2 Compatible with substrate and acceptable to concrete masonry manufacturer for use on products.
- .3 Cleaning compounds compatible with stone masonry units and in accordance with manufacturer's written recommendations and instructions.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify surfaces and conditions are ready to accept work of this Section.
- .2 Examine work of other Sections upon which work of this section is dependent. Should discrepancies be found which affect the proper performance of the work of this section, do not commence work until such discrepancies have been resolved.
- .3 Perform work with minimal cutting and patching.

3.2 PREPARATION

- .1 Protect adjacent finished materials from damage due to masonry work.

3.3 APPLICATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.4 INSTALLATION: GENERAL

- .1 Construction to conform to CAN/CSA A371.
- .2 Where mortar has started to harden at units requiring repositioning, remove and replace with fresh mortar.
- .3 Masonry horizontal and vertical joints to be 10 mm thick except where adjustments are necessary to maintain the bond pattern or to adjust coursing.

3.5 INSTALLATION: STONE MASONRY

- .1 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; avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- .2 Construct cavity walls using techniques that will minimize mortar dropping in cavity space. This may require the use of batten boards to catch mortar droppings. No mortar shall bridge cavity space or plug cavity vents at bottom of cavity.
- .3 Mixing and blending: mix units within each pallet and with other pallets to ensure uniform blend of colour and texture.
- .4 Install hollow masonry units using face shell bedding with full head and bed joints. Minimize mortar protruding or dropping into core spaces.
- .5 Bond: stretcher.
- .6 Coursing height: as indicated on Drawings.
- .7 Jointing: concave where exposed or flush where paint or similar thin finish coating is specified.
- .8 Mixing and blending: mix units within each pallet and with other pallets to ensure uniform blend of colour and texture.
- .9 Clean unglazed clay masonry as work progresses.
- .10 Tolerances:
 - .1 To CAN/CSA A371 unless noted below.

3.6 TOLERANCES

- .1 Tolerances for standard stone masonry tolerances in accordance with CAN/CSA A165.1, supplemented as follows:
 - .1 Maximum variation between units within specific job lot not to exceed 2 mm.
 - .2 No parallel edge length, width or height dimension for individual unit to differ by more than 2 mm.
 - .3 Out of square tolerance not to exceed 2 mm.

3.7 INSTALLATION: CONNECTORS AND REINFORCEMENT

- .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 unless indicated otherwise.
- .2 Prior to placing concrete, obtain Consultant's approval of placement of reinforcement and connectors.

3.8 BONDING AND TYING

- .1 Tie masonry veneer to backing in accordance with current Building Code, CSA-S304.1, CAN/CSA A371 and as indicated.
- .2 Install unit, adjustable, single wythe joint reinforcement where indicated and in accordance with CAN/CSA A370, CAN/CSA A371, and manufacturer's instructions.
 - .1 Install horizontal joint reinforcement 400 mm on centre.
 - .2 Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 400 mm each side of opening.
 - .3 Place joint reinforcement continuous in first and second joint below top of walls.
 - .4 Lap joint reinforcement ends minimum 200 mm.
 - .5 Connect joint corners and intersections with strap anchors 400 mm on centre.

3.9 GROUTING

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

3.10 ANCHORS

- .1 Supply and install metal anchors in accordance with CAN/CSA A370 and CAN/CSA A371 as indicated.

3.11 LATERAL SUPPORT AND ANCHORAGE

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

3.12 CONTROL AND EXPANSION JOINTS

- .1 Install control and expansion joint materials in unit masonry as masonry progresses; do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- .2 Form control joints in concrete masonry consisting of a complete vertical break free from mortar using one of the following methods:
 - .1 Break joint reinforcement at control joints, but extend bond beam reinforcing 400 mm into wall across control joint and wrap with 0.15 mm polyethylene bond breaker.

- .2 Fit bond breaker strips into hollow contour in ends of concrete masonry units on one side of control joint; fill resultant core with grout and rake out joints in exposed faces for application of sealant.
 - .3 Install interlocking units designed for control joints; install bond breaker strips at joint; keep head joints free and clear of mortar or rake out joint for application of sealant.
 - .4 Install temporary foam plastic filler in head joints and remove filler when unit masonry is complete for application of sealant.
 - .5 Refer to Drawings for control and expansion joint locations, and vertical reinforcing requirements; confirm location with Consultant before installation; confirm with Consultant where not shown on Drawings.
- .3 Install a minimum 10 mm high horizontal, pressure relieving joints by either leaving an air space or inserting a compressible filler, sealant and backer rod specified in Section 07 92 00]; locate horizontal, pressure relieving joints beneath shelf angles supporting masonry.
 - .4 Locate joints at 6000 mm centres maximum and at a maximum of 4000 mm from any corners, any other indication notwithstanding.

3.13 FIELD BENDING

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

3.14 INSTALLATION: FLASHINGS

- .1 Build in flashings in masonry in accordance with CAN/CSA A371.
 - .1 Install flashings under exterior masonry bearing on foundation walls, slabs, shelf angles, and steel angles over openings, and at base of cavity wall and where cavity is interrupted by horizontal members or supports and as shown on drawings. Install flashings under weep hole courses and as indicated.
 - .2 In cavity walls and veneered walls, carry flashings from front edge of exterior masonry, under outer wythe, then up backing not less than 150 mm, and as follows:
 - .1 For masonry backing embed or bond flashing 25 mm in joint.
 - .2 For concrete backing, insert or bond flashing into reglets.
 - .3 For wood frame backing, staple flashing to walls behind water resistive paper, and lap joints.
 - .4 For gypsum board and glass fibre faced sheathing backing, bond to wall using manufacturer's recommended adhesive.
 - .3 Lap joints 150 mm and seal with adhesive.
- .2 Form flashing (end dams) at lintels, sills and wall ends to prevent water from travelling horizontally past flashing ends.
- .3 Install vertical flashing where outer veneer returns at window or door jambs, to prevent contact of veneer with inner wall.

3.15 CUTTING AND FITTING

- .1 Build in chases, piping, ducts, sleeves, grounds, blocking, inserts, supports, conduit, outlet boxes, recessed fittings, fixtures and access panels as required to complete the Work. Cooperate fully to ensure correct size, shape and location.
- .2 Cut and make good the stonework to accommodate other Work as the Work proceeds.
- .3 Fill all openings or voids left for services, etc. Where exposed, use same material as remainder of wall; elsewhere use stone or other suitable bearing masonry. Neatly cut to exposed contours of the space, using full size units where possible.
- .4 Obtain Consultant's approval before cutting any part or area that may impair appearance or strength.
- .5 Exposed chases requiring patching are not permitted without approval.

3.16 WEEP HOLES AND CAVITY VENTS

- .1 Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
 - .1 Use open head joints or premanufactured inserts to form weep holes, spaced as follows:
 - .1 Space open head joint weep holes at a maximum of 600 mm o/c.
 - .2 Space weep holes formed from premanufactured inserts at a maximum of 400 mm o/c.
- .2 Install vents in head joints in exterior wythes at same spacing as indicated for weep holes at top of wall and immediately below any cavity obstruction; use same methods to form vents as weep holes listed above.
- .3 Do not use manufactured vent forms.

3.17 REPAIR/RESTORATION

- .1 Upon completion of masonry, fill holes and cracks, remove loose mortar and repair defective work.

3.18 FIELD QUALITY CONTROL

- .1 Site Tests and Inspection as follows:
 - .1 Concrete masonry units will be sampled and tested by independent testing agency appointed and paid by Consultant in accordance with CSA S304.1.
 - .2 Notify inspection agency minimum of 24 hours in advance of requirement for tests.

3.19 STONEMASONRY CLEANING

- .1 At completion, brush and clean exposed stonework using clean water.
- .2 Comply with manufacturer's cleaning recommendations. Do not use cleaning compounds, additives, soaps or detergents unless approved in writing by both the stonework manufacturer and the Consultant.
- .3 Use of acids is not allowed.

- .4 Clean the stonework work using methods approved by the manufacturer.
- .5 Do not use wire brushes or metal tools for cleaning - use fibre brushes, nylon brushes or wood paddles.
- .6 Do not wipe-off mortar or grout runs while wet. Wait until dry and then remove.

3.20 SEALING

- .1 Seal stone work in accordance with manufacturers written instruction.

END OF SECTION