MASONRY GENERAL REQUIREMENTS

1. GENERAL

1.1 Summary

.1 This Section specifies the general requirements for unit block masonry.

.2 Masonry construction may be used for exterior walls and walls systems where required for the Final Design. Exterior envelope masonry walls shall be insulated.

.3 Masonry construction shall be used for interior walls and wall systems when priorities include permanence, maintenance, sound transmission control, fire resistance, separation and security.

.4 Concrete unit masonry shall be used for both independent exterior walls, and in exterior wall systems as a structural backing to other finish materials or systems.

.5 Concrete unit masonry for interior applications shall be used as an integrally finished material, as a base for applied finish and as a structural backing to other finish systems.

.6 Painted or unpainted concrete unit masonry as an exposed finish may be used unless otherwise specified in the Technical Requirements.

1.2 Submittals

.1 Provide submittals in accordance with Sections 01300 and the following:

.1 Manufacturer's descriptive literature for materials.

.2 Provide samples of masonry, reinforcing, control joint materials, flashings, plugs, ties and related accessories.

.3 Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

.1 Construct sample for review and approval of Professional of Record:

.1 Size: 1.2 m by 1.2 m.

.2 Include all unit types and sizes to be used, and mortar joint treatment.

2. PRODUCTS

2.1 Performance Criteria

.1 Where used as a component of an exterior wall assembly, concrete masonry units shall be fully protected by an air-vapour barrier membrane and thermal insulation on the cold side of the units and special attention shall be paid to minimize thermal bridging at supports for the exterior wall finishes. The interior surface of insulated exterior masonry walls shall have a low-maintenance surface.

.2 Masonry design and construction shall comply with Canadian Masonry Contractors Association Masonry Practices manual and all applicable standards.

.3 Radius all exposed corners where concrete masonry units are the exposed finish.

.4 Brick Masonry:

.1 Brick masonry shall be considered as a finish veneer to concrete, concrete masonry or metal framing. Exterior wall systems in such applications shall be a rain screen or cavity wall system.

.2 Brick masonry shall not be permitted below grade in exterior applications.

.5 Stone Masonry:

.1 Stone masonry shall be considered as a finish veneer to concrete walls or concrete masonry walls. Exterior wall systems in such applications shall be a rain screen or cavity wall system.

.2 Stone shall be sound, hard and durable, well-seasoned and of uniform strength, colour and texture, and free of quarry sap, flaws, seams, sand holes, iron pyrites or other mineral or organic defects.

.6 Glass Block:

.1 Glass block may be considered as a glazing material requiring both privacy and natural light.

.2 Install glass block in accordance with CAN/CSA-A179 - Mortar and Grout for Unit Masonry.

.3 Base glass blocks:

.1 Acceptable Products:

.1 Pittsburgh Corning Signature Line Premiere Series.

.2 Or approved equivalent.

3. EXECUTION

3.1 General

.1 Install in accordance with Manufacturer’s recommendations and as required by the Final Design.

.2 Undertake commissioning phases as specified in the Technical Requirements.

END OF SECTION

MASONRY PROCEDURES

1. GENERAL

1.1 Summary

.1 This Section specifies the masonry work procedures.

1.2 Standards

.1 Canadian Standards Association (CSA):

.1 CSA A371 - Masonry Construction for Buildings.

1.3 Submittals

.1 Provide submittals in accordance with Sections 01300, 04000 and the following:

.1 Manufacturer's descriptive literature for materials.

.2 Submit laboratory test reports certifying compliance of masonry units and mortar ingredients with Specification requirements.

.3 Submit laboratory test reports showing compliance with specified performance characteristics and physical properties.

.4 For clay units, in addition to requirements set out in CSA and ASTM standards, include data indicating initial rate of absorption.

.5 Submit samples tested to laboratories employing technicians certified/trained in procedures for testing masonry units. Samples to include:

.1 Two (2) of each type of masonry unit specified.

.2 One (1) of each type of masonry accessory specified.

.3 One (1) of each type of masonry reinforcement and tie proposed for use.

.4 Other items in quantities as required for testing purposes.

2. PRODUCTS (NOT USED)

3. EXECUTION

3.1 General

.1 Install in accordance with Manufacturer’s recommendations and as required by the Final Design.

.2 Undertake commissioning phases as specified in the Schedule 18 Technical Requirements.

.3 Do masonry work in accordance with CSA-A371.

.4 Build masonry plumb, level, and true to line, with vertical joints in alignment.

.5 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

.6 Tolerances in accordance with CSA-A371.

3.2 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.

3.3 Support of Loads

.1 Use 20 MPa concrete according to Section 03300.

3.4 Provision for Movement

.1 Leave 3 mm space below shelf angles.

.2 Leave minimum 20 mm space between top of non-load bearing walls and partitions and structural elements. Space shall not be less than structural element deflection due to live load plus 10 mm. Do not use wedges.

3.5 Control Joints

.1 Install vertical control joints at maximum of 8 m spacing.

.2 Bond beam reinforcing continuous through vertical control joint but cut alternate truss wire joint reinforcement.

END OF SECTION

MORTAR AND MASONRY GROUT

1. GENERAL

1.1 Summary

.1 This Section specifies mortar and masonry grout requirements.

1.2 Standards

.1 All codes and standards to be latest edition unless noted otherwise.

.2 Canadian Standards Association (CSA):

.1 CSA A179 - Mortar and Grout for Unit Masonry.

.2 CAN/CSA A23.1 - Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.3 CSA A371 - Masonry Construction for Buildings.

1.3 Submittals

.1 Provide submittals in accordance with Sections 01300, 04000 and the following:

.1 Manufacturer's descriptive literature for materials.

2. PRODUCTS

2.1 Materials

.1 Mortar: conform to CSA A179.

.1 Aggregate: conform to CSA A179.

.2 Water: clean, potable, free of injurious amounts of acids, alkalis and organic material.

.3 Masonry cement: conform to CSA A179 Type S.

.4 Portland cement: conform to CAN/CSA A23.1 Type GU.

.5 Hydrated lime: conform to CSA A179.

.2 Use aggregate passing 1.2 mm sieve where 6mm thick joints are indicated.

.3 Colour shall match concrete masonry unit.

.4 Dirt-resistant additives: aluminum tristearate, calcium stearate or ammonium stearate.

2.2 Material Source

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

2.3 Mortar Types

.1 Mortar for masonry:

.1 Load and non-load bearing walls: CSA A179, Type S, 15 MPa minimum compressive strength at twenty-eight (28) days.

2.4 Concrete Grout

.1 Infill concrete grout in masonry walls to Section 03300.

.2 Grout compressive strength: 20 MPa minimum at twenty-eight (28) days.

2.5 Pointing Mortar

.1 Pointing mortar: colour shall match mortar, Type S to CSA A179, with not more than 2 percent calcium or ammonium stearate added.

3. EXECUTION

3.1 General

.1 Install in accordance with Manufacturer’s recommendations and as required by the Final Design.

.2 Undertake commissioning phases as specified in the Schedule 18 Technical Requirements.

3.2 Mixing

.1 Do masonry mortar and grout work in accordance with CSA A179.

.2 Mix grout to semi-fluid consistency.

.3 Incorporate admixtures into mixes in accordance with manufacturer's instructions.

.4 Use clean mixer for mortar.

.5 Pre-hydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp unworkable mix that retains its form when pressed into ball. Allow to stand for not less than one (1) hour and not more than two (2) hours then remix with sufficient water to produce mortar of proper consistency for pointing.

.6 Comply with cold weather requirements specified in CSA-A371 Masonry Construction for Buildings.

3.3 Testing

.1 Testing of mortar and grout to be in accordance with CSA A179.

.2 At least six (6) 50 mm mortar cubes are to be prepared and tested from the same materials and in the same proportions as those to be used in the masonry construction.

END OF SECTION

MASONRY REINFORCEMENT AND CONNECTORS

1. GENERAL

1.1 Summary

.1 This Section specifies the requirements for masonry reinforcement and connectors.

1.2 Standards

.1 Canadian Standards Association (CSA):

.1 CSA A370 - Connectors for Masonry.

.2 CSA A371 - Masonry Construction for Buildings.

.3 CSA A23.1 - Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.4 CSA S304.1 - Design of Masonry Structures.

1.3 Submittals

.1 Provide submittals in accordance with Sections 01300, 04000 and the following:

.1 Manufacturer's descriptive literature for materials.

.2 Provide submittals for masonry reinforcement and connection details.

2. PRODUCTS

2.1 Materials

.1 All codes and standards to be latest edition unless noted otherwise.

.2 Bar reinforcement: to CSA A371 and CSA G30.18, Grade 400W.

.3 Wire reinforcement: to CSA A371 and CSA G30.3, truss type.

2.2 Fabrication

.1 Fabricate reinforcing in accordance with CSA A23.1 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

.2 Obtain City’s approval for placement of reinforcement splices in locations other than those specified or shown in the Technical Requirements.

3. EXECUTION

3.1 General

.1 Install in accordance with Manufacturer’s recommendations and as required by the Final Design.

.2 Undertake commissioning phases as specified in the Schedule 18 Technical Requirements.

.3 Do masonry reinforcement in accordance with latest edition of CSA A370, CSA A371, CSA A23.1 and CSA S304.1.

.4 Prior to placing grout, obtain designer's approval of placement of reinforcement and connectors.

3.2 Reinforced Lintels and Bond Beams

.1 Reinforce masonry lintels and bond beams as required by the Final Design. Minimum reinforcement to lintels shall be 2-15 m top and bottom extending minimum 600 mm past opening.

.2 Place and reinforce grout in accordance with CSA S304.1.

END OF SECTION

MASONRY ACCESSORIES

1. GENERAL

1.1 Summary

.1 The Section specifies masonry accessories.

1.2 Standards

.1 All codes and standards to be latest edition unless noted otherwise.

.2 Canadian Standards Association (CSA):

.1 CSA A370 - Connectors for Masonry.

.2 CSA A371 - Masonry Construction for Buildings.

.3 CSA G30.18 - Carbon Steel Bars for Concrete Reinforcement.

1.3 Submittals

.1 Provide submittals in accordance with Sections 01300, 04000 and the following:

.1 Manufacturer's descriptive literature for materials.

2. PRODUCTS

2.1 Materials

.1 Control joint filler: preformed rubber, neoprene or polyvinyl chloride materials of size and shape indicated.

.2 Masonry reinforcing: conform to CSA-A371, truss type, minimum 3.8 mm deformed wires galvanized finish; sized 50 mm narrower than wall.

.3 Reinforcing bars: conform to CSA G30.18 Grade 400.

.4 Anchors: to CSA-A370.

.1 Plate type: minimum 3 mm galvanized steel of shapes and sizes to suit purpose.

.2 Wire type: 4 mm galvanized wire of shapes and sizes shown.

.3 Anchor bolts: including nuts, washers, studs, ferrules, and related items, galvanized steel or bronze.

3. EXECUTION

3.1 General

.1 Install in accordance with Manufacturer's recommendations and as required by the Final Design.

.2 Undertake commissioning phases as specified in the Schedule 18 Technical Requirements.

3.2 Installation of Accessories

.1 Install masonry connectors and reinforcement in accordance with CSA-A370 and CSA-A371.

END OF SECTION

UNIT MASONRY

1. GENERAL

1.1 Summary

.1 The Section specifies unit masonry.

1.2 Standards

.1 All codes and standards to be latest edition unless noted otherwise.

.2 Canadian Standards Association (CSA):

.1 CSA A370 - Connectors for Masonry.

.2 CSA A371 - Masonry Construction for Buildings.

.3 CSA A165.1 - Concrete Masonry Units.

1.3 Submittals

.1 Provide submittals in accordance with Sections 01300, 04000 and the following:

.1 Manufacturer's descriptive literature for materials.

2. PRODUCTS

2.1 Materials

.1 Concrete blocks: conform to CSA-A165.1, light-weight type H/15/C/M, standard block, and grey in colour.

.2 Notwithstanding visual inspection requirements of CSA standards, masonry units are to be free of surface indentations, surface cracks due to manufacture, or chipping.

3. EXECUTION

3.1 General

.1 Install in accordance with Manufacturer’s recommendations and as required by the Final Design.

.2 Undertake commissioning phases as specified in the Schedule 18 Technical Requirements.

.3 Cover tops of completed and partially completed walls with waterproof coverings at end of each working day. Drape covers over walls and extend 600 mm down both sides. Anchor securely in position.

.4 Protect adjacent finished surfaces from being marked or damaged by masonry work.

.5 Provide temporary bracing of masonry work during erection to prevent wind damage or other lateral loads until permanent structure provides adequate bracing.

.6 Build masonry work true-to-line, plumb, square and level, with vertical joints in proper alignment.

.7 Tolerances for exposed masonry work shall be:

.1 Variation from mean plane: 3 mm under 2.5 m straight edge.

.2 Variation in masonry openings: 6 mm maximum.

.3 Variation from plumb: 9 mm in 6 m.

.8 Assume complete responsibility for dimensions, plumbs and levels of this work and constantly check same with graduated rod.

.9 Masonry courses shall be of uniform height, and both vertical and horizontal joints shall be of equal and uniform thickness.

.10 Provide temporary lateral supports during construction.

3.2 Blockwork

.1 Lay concrete block in running bond, with thicker end of face shell upward. Coursing shall be modular 200 mm for one (1) block and one (1) joint.

.2 Use special shaped units where required. Use bull-nosed units for exposed corners, window jambs, and other features. Exposed open cells shall not be permitted.

.3 Concrete masonry units shall have face shells and their end joints completely filled with mortar, and joints squeezed tight. Fill webs at cores, to be reinforced and grouted, and strike flush at core taking care to prevent mortar from falling into core.

.4 Tie intersecting walls together with masonry reinforcing every second course.

.5 Reinforce masonry walls vertically and horizontally, as required by the Final Design.

3.3 Mortar and Pointing

.1 Make all joints uniform in thickness, straight, in line, with mortar compressed to form concave joints.

.2 Strike joints flush where walls are to receive plaster or similar finishes.

.3 Point faced blockwork by filling holes and cracks in exposed mortar joints. Cut out defective joints, refill solidly with mortar and tool to form neat concave joint.

3.4 Building In

.1 Build-in door and window frames, steel lintels, sleeves, anchor bolts, anchors, nailing strips and other items to be built into masonry.

.2 Do not distort metal frames. Bed anchors of frames in mortar and fill frame voids with mortar or grout as walls are erected.

3.5 Bearings

.1 Fill concrete block solid with a minimum of 20 MPa concrete from wall base to below bearing points of structural members.

3.6 Control Joints

.1 Provide continuous vertical control joints in concrete block walls at locations, at a maximum 8 m on centre.

.2 Cut alternate truss wire reinforcing each side of joints.

3.7 Cutting Masonry

.1 Masonry units exposed in finished work shall not be cut with power saws. Where electrical conduit outlets and switch boxes occur, grind and cut units before services are installed.

.2 Obtain approval from the designer before cutting any part of area which may impair appearance or strength of the Work.

.3 Patching of masonry shall not be permitted.

3.8 Bond Beams

.1 Make bond beams of special blocks with a minimum of two (2) deformed 15M reinforcing bars placed in bottom and fill with 20 MPa concrete.

3.9 Reinforced Block Lintels

.1 Install reinforced concrete block lintels at openings.

.2 Support reinforced concrete block lintels until in-filled concrete has attained their twenty-eight (28) day strength.

.3 Place 25 mm of concrete in voids, lay in horizontal reinforcing bars as required by the Final Design and place concrete to level of block. Rod and tamp concrete well without disturbing reinforcing. Allow lintel concrete to cure for twenty-eight (28) days before removing shores.

.4 Minimum bearing shall be 400 mm each side of openings.

3.10 Cavity

.1 Keep air space in cavity free from mortar droppings by placing wood strip on the ties or reinforcement. Strip to be on line cord and be pulled up level and cleaned of droppings prior to laying next course of ties or reinforcement.

3.11 Provisions for Other Trades

.1 Accurately locate chases and openings and neatly finish to required sizes.

.2 Build masonry neatly around conduits, ducts, sleeves and piping passing through.

3.12 Cleaning

.1 On completion, remove all excess mortar and smears that may remain, using wood paddles or scrapers.

.2 Point or replace defective mortar to match existing, as required or directed.

.3 Scrub surfaces to be cleaned using non-acid cleaning solution of type which does not harm constructed masonry. Use acceptable solution recommended by masonry unit manufacturer.

.4 Repeat cleaning until work is satisfactory.

END OF SECTION