PART 1 GENERAL

1.1 WORK INCLUDED

.1 This Section specifies requirements for supplying, transporting and installing brick and concrete unit masonry including masonry accessories, connectors, mortar and grout where indicated.

1.2 RELATED WORK

.1 Reinforced Lintels, Bond Beams and Core Fills: Section 03 30 00

.2 Metal Fabrications: Section 05 50 00

.3 Sheet Membrane Air/vapour Barrier: Section 07 27 00

.4 Insulation: Section 07 21 00

.5 Firestopping and Smoke Seals: Section 07 80 00

.6 Sealants: Section 07 92 00

.7 Hollow Metal Doors, Frames and Hardware: Section 08 11 14

1.3 REFERENCE STANDARDS

.1 AASHTO M32-2009, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

.2 ASTM A153/A153M-09, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.3 ASTM D1056-2014, Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.

.4 CAN/CSA A165 Series-2014, CSA Standards on Concrete Masonry Units.

.5 CSA-G30.18-09(R2014), Carbon Steel Bars for Concrete Reinforcement.

.6 CSA-S304.1-04(R2010), Design of Masonry Structures.

.7 CSA-W186-M1990(R2012), Welding of Reinforcing Bars in Reinforced Concrete Construction.

.8 CAN/CSA A179-2014, Mortar and Grout for Unit Masonry.

.9 CAN/CSA A370-2014, Connectors for Masonry.

.10 CAN/CSA A371-2014, Masonry Construction for Buildings.

1.4 REQUIREMENTS OF REGULATORY AGENCIES

.1 Construct masonry work as required by jurisdictional authorities.

.2 Before commencing masonry Work, verify site conditions will allow construction of masonry within required limitations of wall heights, wall thicknesses, openings, bond, anchorage, lateral support, and compressive strength of masonry units and mortars.

1.5 SHOP DRAWINGS

.1 Submit shop drawings for masonry reinforcement and connectors in accordance with Section 01 33 00.

.2 Shop drawings consist of bar bending details, lists and placing drawings.

.3 On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and connectors.

.4 Submit samples of facebrick for review and approval.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to job site in dry condition.

.2 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

.3 Deliver products to the place on site as directed, and to meet installation schedule.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Cold weather requirements:
.1 Conduct all work in accordance with CSA-A371.
.2 Supplement Clause 5.15.2 of 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.

1.8 PROTECTION

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

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

PART 2 PRODUCTS

2.1 MORTAR AND GROUT MIXING

.1 Mortar: to CSA-A179.

.2 Concrete Grout: as specified in Section 03 30 00.

.3 Use aggregate passing 1.18 mm sieve where 6 mm thick joints are indicated.

.4 Colour: ground coloured natural aggregates or metallic oxide pigments unless indicated otherwise.

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

.6 Mortar for all walls: Type S based on Proportion specifications of CSA-A179.

2.2 MASONRY ACCESSORIES

.1 Masonry reinforcing: horizontal joint reinforcing to CSA A370, welded, truss type, fabricated from 4.76 mm diameter steel wire to AASHTO M32, deformed for longitudinal wires and smooth for cross wires, with loops for box ties where faced with masonry veneer, hot dip galvanize after fabrication to ASTM A153/A 153M, Class B, 458 g/m^2 zinc coating.
.1 Cavity wall, brick veneer: use extra heavy duty truss type in conjunction with the insulation fastener system.
.2 Load bearing interior masonry walls: use extra heavy duty truss type for single wythe masonry walls.
.3 Non-Load bearing interior masonry walls: use standard duty BL-10 (ladder) or for single wythe masonry walls.

.2 Reinforcing steel for core-filled masonry: to CAN/CSA-G30.18, Grade 400, and as specified in Section 03 20 00.

.3 Control joint filler: purpose-made closed cell neoprene to ASTM D1056 of size and shape indicated, and backer rod and caulking as per section 07 92 00.

.4 Masonry thru-wall flashing: purpose made rubberized base flashing, complete with primer/adhesive.

.5 Weep hole vents: ultraviolet resistant polypropylene co-polymer, 13 mm wide x 90 mm deep x 100 mm high vent, colour to suit mortar.

.6 Dovetail anchor slots: as specified in Section 03 30 00.

.7 Mortar mesh.

2.3 UNIT MASONRY

.1 Standard concrete masonry units, type stretchers: to CSA A165 Series:
.1 Classification: H/15/A/M.
.2 Size: 200mm x 200mm x 400 mm (typical sized unit
.3 Special shapes: provide purpose-made shapes for lintels and bond beams; at doors jamb openings.

PART 3 EXECUTION

3.1 WORKMANSHIP

.1 Conduct Work in accordance with CSA-A371.

.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 Exercise care to provide full mortar joint coverage on all bearing surfaces of masonry. Replace masonry that does not meet above requirement.

3.2 TOLERANCES

.1 Tolerances in notes to Clause 5.3 of CSA-A371 apply.

3.3 EXPOSED MASONRY

.1 Remove chipped, cracked, and otherwise damaged units in exposed masonry and replace with undamaged units.

3.4 JOINTING

.1 Allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, compressed, uniformly concave joints unless otherwise indicated.

3.5 BUILDING-IN

.1 Verify accessories, frame anchors, guards, and such items specified in other Sections are available for building in before Work commences. Cooperate in the setting and aligning of built-in Work and provide for later installation of items which are included in the Work of other Sections, to avoid cutting, fitting, and patching.

.2 Prevent displacement of built-in items during construction.

3.6 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.

3.7 REINFORCEMENT AND CONNECTORS

.1 Fabrication:
.1 Fabricate reinforcement in accordance with CSA-A23.1 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
.2 Fabricate connectors in accordance with CSA-A370.
.3 Obtain the Departmental Representative approval for locations of reinforcement splices other than shown on placing drawings.
.4 Upon approval of the Departmental Representative, weld reinforcement in accordance with CSA W186.
.5 Ship reinforcement and connectors, clearly identified in accordance with drawings.

.2 General:
.1 Supply and install masonry connectors and reinforcement in accordance with CSA-A370, CSA-A371, CSA-A23.1 and CSA-S304.1 unless indicated otherwise.
.2 Prior to placing concrete, mortar, or grout, obtain the Departmental Representative’s approval of placement of reinforcement and connectors.

.3 Movement joints:
.1 Reinforcement will not be continuous across movement joints unless otherwise indicated.

.4 Field bending:
.1 Do not field bend reinforcement and connectors except where indicated or authorized by the Departmental Representative.
.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.

3.8 LAYING MASONRY UNITS

.1 Bond: running.

.2 Coursing heights: 200 mm for one block and one joint; 200 mm for three (3) brick and three (3) joints.

.3 Jointing: concave where exposed or where paint coating is specified.

.4 Mixing and blending: mix units within each pallet and with other pallets to ensure uniform blend of colour and texture.

.5 Cut blocks as required to ensure coursing height aligns with intersecting and adjacent walls.

3.9 MASONRY ACCESSORIES

.1 Masonry reinforcing ties:
.1 Install ties in accordance with CSA A370 and CSA-A371. In case of conflict between these two standards, the more stringent requirements will apply.
.2 Place reinforcement continuously in horizontal joints at 400 mm o.c., beginning with course above bearing, unless otherwise specified or indicated.

.2 Core-fill reinforcement:
.1 Install bars vertically and continuously in cores of hollow masonry units where indicated.
.2 Embed bars solidly in cores with concrete grout filling voids completely.
.3 Install reinforcing steel in core fills and bond beams where indicated.

.3 Mortar mesh: place in the wall air space horizontally above the foundation walls and above all lintels.

.4 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 oc.

3.10 MORTAR AND GROUT MIXING

.1 Prehydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp workable mix that will retain its form when pressed into ball. Allow to stand for not less than 1 hour nor more than 2 hour then remix with sufficient water to produce mortar of proper consistency for pointing.

.2 Mix mortar in mechanical batch mixer using material proportions to produce specified strengths while keeping water-cement ratios to the minimum required to produce proper workability.

.3 Mix grout to semi-fluid consistency to manufacturer's instructions.

.4 Mix in dry block admix to mortar for exterior block work at the rate of 500 ml per 45 kg of cement.

.5 Mix in mortar colour pigments.

3.11 SUPPORT OF LOADS

.1 Use 20 MPa concrete grout to Section 03 30 00 where concrete fill is used instead of solid units in core fills and lintels. Install grout in accordance with CSA-A371.

.2 Install expanded metal mesh below voids to be filled with concrete or grout, keep mesh 25 mm back from faces of units.

.3 Install reinforced concrete block lintels over openings in masonry where steel or reinforced concrete lintels are not indicated.

3.12 PROVISION FOR MOVEMENT

.1 Caulk corner joints of all block work where walls butt into continuous walls, at dissimilar material intersections (concrete walls and columns) and at masonry wall intersection with floor slabs, caulking to be done before painting. Slightly rake the vertical mortar joint during installation so as to provide slight slot for caulking joint. Tie wall butting to intersecting wall with anchor system with masonry screw anchors and ties at every second block course.

3.13 CLEANING

.1 Clean concrete block as work progresses.

.2 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.

END OF SECTION

PART 1 GENERAL

1.1 WORK INCLUDED

.1 This Section specifies requirements for supplying, transporting and installing stone veneer masonry including all required accessories, connectors, mortar and grout where indicated.

1.2 RELATED SECTIONS

.1 Insulation: Section 07 21 00

.2 Sealants: Section 07 92 00

.3 Hollow Metal Doors and Frames: Section 08 11 14

1.3 REFERENCE STANDARDS

.1 ASTM C39-17a, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

.2 ASTM C67-16, Standard Test Method for Sampling and Testing Brick and Structural Clay Tile.

.3 ASTM C177-2013, Standard Test method for Steady State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot Plate Apparatus.

.4 ASTM C192-16A, Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.

.5 ASTM C482-02(R2014), Standard Test Method for Board Strength of Ceramic Tile to Portland Cement Paste.

.6 ASTM D1056-2014, Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.

.7 CSA A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.8 CSA A165 Series-14, CSA Standards on Concrete Masonry Units.

.9 CSA A179-14, Mortar and Grout for Unit Masonry.

.10 CSA A370-2014, Connectors for Masonry.

.11 CSA A371-14, Masonry Construction for Buildings.

.12 CSA G30.18-09(R2014), Billet-Steel Bars for Concrete Reinforcement.

.13 CSA S304.1-14, Design of Masonry Structures.

.14 CSA W186-M1990(R2016), Welding of Reinforcing Bars in Reinforced Concrete Construction.

1.4 REQUIREMENTS OF REGULATORY AGENCIES

.1 Construct masonry work as required by jurisdictional authorities.

.2 Before commencing masonry Work, verify site conditions will allow construction of masonry within required limitations of wall heights, wall thicknesses, openings, bond, anchorage, lateral support, and compressive strength of masonry units and mortars.

1.5 SHOP DRAWINGS

.1 Submit shop drawings for masonry reinforcement and connectors in accordance with Section 01 33 00.

.2 Shop drawings consist of bar bending details, lists and placing drawings.

.3 On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and connectors.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Handle and store product according to manufacturer's written instructions.

.2 Deliver materials to job site in dry condition.

.3 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

.4 Deliver products to the place on site as directed, and to meet installation schedule.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Cold weather requirements:
.1 Conduct all work in accordance with CSA-A371.
.2 Supplement Clause 5.15.2 of 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.

1.8 PROTECTION

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

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

PART 2 PRODUCTS

2.1 MORTAR AND GROUT MIXING

.1 Mortar: to CSA A179.

.2 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents.
.1 Compressive strength: 50 MPa at 28 days.
.2 Consistency:
.1 Fluid: to ASTM C827. Time of efflux through flow cone (ASTM C939), under 30 s.
.2 Flowable: to ASTM C827. Flow table, 5 drops in 3 s, (ASTM C109, applicable portion) 125 to 145%.
.3 Plastic: to ASTM C827. Flow table, 5 drops in 3 s, (ASTM C109, applicable portions) 100 to 125%.
.4 Dry pack to manufacturer’s requirements.
.3 Acceptable products: SikaGrout 212 as manufactured by Sika Canada Inc., Masterflow 928 as manufactured by BASF Corporation, or approved equivalent.

.3 Use aggregate passing 1.18 mm sieve where 6 mm thick joints are indicated.

.4 Mortar for all walls: Type S based on Proportion specifications of CSA-A179.

2.2 STONE VENEER MASONRY

.1 Properties:
.1 Compressive strength: 12.4 MPa to ASTM C192/ASTM C39.
.2 Board strength: 345kPa (50psi) to ASTM C482.
.3 Thermal resistance: 0.335/inch of thickness to ASTM C177.
.4 Freeze/thaw: no disintegration and less than 3% weight loss to ASTM C67.

PART 3 EXECUTION

3.1 WORKMANSHIP

.1 Conduct all work in accordance with CSA A371 and the manufacturer's written instructions.

.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 Exercise care to provide full mortar joint coverage on all bearing surfaces of masonry. Replace masonry that does not meet above requirement.

3.2 TOLERANCES

.1 Tolerances in notes to Clause 6.2 of CSA-A371 apply.

3.3 DAMAGED MASONRY

.1 Remove chipped, cracked, and otherwise damaged units in masonry and replace with undamaged units.

3.4 BUILDING-IN

.1 Verify accessories, frame anchors, guards, and such items specified in other Sections are available for building in before Work commences. Cooperate in the setting and aligning of built-in Work and provide for later installation of items which are included in the Work of other Sections, to avoid cutting, fitting, and patching.

.2 Prevent displacement of built-in items during construction.

3.5 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.

3.6 PLACING GROUT

.1 Grout where indicated using procedures in accordance with the manufacturer’s written instructions and resulting in 100% contact over grouted area.

3.7 INSTALLING MASONRY UNITS

.1 Using a trowel, apply motar 12.7mm – 19.1mm thick to prepared surface area. Do not spread more than a workable area of 0.47 - 0.93m^2 so that mortar will not set up before stone is applied. Provide complete coverage between the mortar bed and back surface of the stone. Mortar may also be applied to the entire back of the stone.

.2 Apply mortar and stone working from the bottom up, or most stones can be applied from the top down. Working from the top down may help avoid splashing previously applied stone with dripping mortar. Install ledgestone types from the bottom up.

.3 Joint width: in order to obtain the most natural look, joints should be as narrow as possible, average joints should not exceed 12.7 - 19.1mm in width.

.4 Setting the stones: press each stone into the mortar setting bed firmly enough to squeeze some mortar out around the stone's edges. Apply pressure to the stone to achieve good bond.

3.8 MORTAR AND GROUT MIXING

.1 Prehydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp workable mix that will retain its form when pressed into ball. Allow to stand for not less than 1 hour nor more than 2 hour then remix with sufficient water to produce mortar of proper consistency for pointing.

.2 Mix mortar in mechanical batch mixer using material proportions to produce specified strengths while keeping water-cement ratios to the minimum required to produce proper workability.

.3 Mix grout to semi-fluid consistency to manufacturer's instructions.

3.9 PROVISION FOR MOVEMENT

.1 Provide joint fillers and sealant at top of masonry walls. Materials as specified in Section 03 30 00.

.2 Caulk corner joints of all block work where walls butt into continuous walls, at dissimilar material intersections (precast concrete walls, concrete walls and columns, etc.) and at masonry wall intersection with floor slabs, caulking to be done before painting. Slightly rake the vertical mortar joint during installation so as to provide slight slot for caulking joint.

3.10 CLEANING

.1 Clean concrete block and brick masonry as work progresses.

.2 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.

END OF SECTION