PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 05 12 - Mortar and Masonry Grout.

.2 Section 04 05 19 - Masonry Anchorage and Reinforcing.

.3 Section 04 05 23 - Masonry Accessories.

.4 Section 04 22 00 - Concrete Unit Masonry.

.5 Section 05 50 00 - Metal Fabrications.

.6 Section 07 21 12 - Board Insulation.

.7 Section 07 90 00 - Joint Sealing.

1.2 REFERENCES

.1 CSA A179-04(R2009), Mortar and Grout for Unit Masonry.

.2 CSA A371-M2004(R2009), Masonry Construction for Buildings.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit samples:
.1 Two of each type of masonry unit specified.
.2 One of each type of masonry accessory specified.
.3 One of each type of masonry reinforcement, tie and connector proposed for use.
.4 As required for testing purposes.

1.4 JOB MOCK-UP

.1 Construct mock-ups.

.2 Construct mock-up panel of exterior masonry wall construction 1200 x 1800 mm showing masonry colours and textures, use of reinforcement, ties, through-wall flashing, weep holes, jointing, coursing, mortar and workmanship.

1.4 JOB MOCK-UP (Cont'd)

.3 Construct mock-up where directed by Departmental Representative.

.4 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with work.

.5 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to job site in dry condition.

.2 Keep materials dry until use.

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

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Cold weather requirements .1 Supplement Clause 5.15.2 of A371-M94 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.

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

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

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Masonry materials are specified in related Sections indicated in 1.1.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Do masonry work in accordance with A371 except where specified 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.

3.2 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 round jointer to provide smooth, joints true to line, compressed, uniformly concave joints where concave joints are indicated.
.2 Strike flush all joints concealed in walls and joints in walls to receive insulation, or other applied material except paint or similar thin finish coating.
.3 Remove mortar fins from the inside surfaces of all cells to be grouted so that grout will flow easily into position and no obstruction will occur.

.3 Cutting
.1 Cut out for electrical switches, outlet boxes, and other recessed or built-in objects.
.2 Make cuts straight, clean, and free from uneven edges.

.4 Building-In

3.2 CONSTRUCTION (Cont'd)

.4 (Cont'd)
.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 30 MPa concrete to Section 03 30 00 - Cast-in-Place Concrete, where concrete fill is used in lieu of solid units.
.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 concrete; keep paper 25 mm back from faces of units.

.6 Provision for movement:
.1 Leave 3 mm space below shelf angles.
.2 Leave 6 mm space between top of non-load bearing walls and partitions and structural elements. Do not use wedges.
.3 Built masonry to tie in with stabilizers, with provision for vertical movement.

.7 Loose steel lintels
.1 Install loose steel lintels. Centre over opening width.

.8 Control joints
.1 Construct continuous control joints as indicated.

.9 Grouting:
.1 Grouting of all masonry walls shall be carried out by pumping unless otherwise approved.
.2 Grouting shall be carried out by either the high or low lift method as specified under CAN3-A371-M94, Section 5.9.
.3 No grouting shall begin until the Departmental Representative has verified the following:
.1 All face shells and cross webs forming cells have been fully bedded in mortar to prevent leakage of grout.
.2 Mortar fins have been removed from all cells designated to receive grout.

3.2 CONSTRUCTION (Cont'd)

.9 (Cont'd)

.3 (Cont'd)

.3 All mortar droppings and other foreign materials have been removed from all cells to be grouted. Clean-outs shall be provided at the bottom of all cells to be grouted by the high lift method.

.4 Reinforcement is free of all dirt, oil or other coatings detrimental to bonding.

.5 Reinforcement is centered in and securely tied in position in all reinforced cells. Ties to be approved by the Departmental Representative.

.6 Walls have reached a minimum age of 12 hours.

.7 Size and spacing of reinforcement are as indicated on drawings and as specified.

3.3 SITE TOLERANCES

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

3.4 FIELD QUALITY CONTROL

.1 Inspection and testing will be carried out by Testing Laboratory designated by Departmental Representative.

.2 Owner will pay costs for testing.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 05 00 - Common Work Results for Masonry.

.2 Section 04 05 19 - Masonry Anchorage and Reinforcing.

.3 Section 04 05 23 - Masonry Accessories.

.4 Section 04 22 00 - Concrete Unit Masonry.

1.2 REFERENCES

.1 CSA A179-04(R2009), Mortar and Grout for Unit Masonry.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Shop Drawings and Other Submittal Procedures.

.2 Submit two samples of all mortar types to be incorporated in the work.

PART 2 - PRODUCTS

2.1 MATERIALS

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

.2 Mortar and grout: CSA A179.

.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.

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

.6 Mortar for foundation walls, manholes, sewers, pavements, walks, and other exterior masonry at or below grade: Type S based on Proportion specifications.

2.1 MATERIALS (Cont'd)

.7 Mortar for interior masonry:
.1 Non-loadbearing: Type O based on Proportion specifications.

.8 Following applies regardless of mortar types and uses specified above:
.1 Mortar for grouted reinforced masonry: Type S based on Proportion specifications.

.9 Non-staining mortar: use non-staining masonry cement for cementitious portion of specified mortar type.

.10 Grout:
.1 Grout to CSA A179, proportion specifications, producing a minimum compressive strength of 12 MPa at 28 days when tested in accordance with Clause 8.3 (non-absorbent mould test).
.2 Grout to be of fluid consistency with a slump of 250mm, when tested in accordance with clause 8.2 of CSA A179M, to provide full bonding to face shells and full grouting of cells.

PART 3 - EXECUTION

3.1 CONSTRUCTION

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

.2 The masonry concrete batch area environment shall be totally controlled and temperature of this area shall not be less than 10°C.

3.2 MORTAR

.1 Mixing mortar:
.1 Thoroughly mix mortar in a power mixer for a period of not less than 5 minutes after all material have been placed in the mixer.
.2 The method of proportioning materials for the mortar used in the construction shall be controlled and accurately maintained.

3.2 MORTAR (Cont'd)

.1 (Cont'd)

.3 After the initial mixing, keep mortar tempered by adding water as required, so that the mortar will contain the maximum amount of water consistent with good workability.

.4 Discard mortar not used within the following time limits: temperature 27°C or higher - 2 1/2 hours, temperature from 27°C to 10°C - 3 1/2 hours, under 10°C - 2 1/2 hours.

.2 Placing mortar:

.1 All joints shall be full mortar joints with no voids.

.2 Butter end joints of units with mortar and push into place.

.3 When mortar in thumbprint hard, strike joints with a trowel and tool to a hard concave surface.

.4 All block work must be finished to a standard acceptable for exposed and finished masonry.

.5 Where cells are to be grouted, place mortar in webs to prevent loss of grout into adjacent cells not designated to receive grout. Clean all mortar fins from surfaces of cells to receive grout.

3.3 GROUT

.1 Mixing grout:

.1 Mix all ingredients thoroughly for at least 5 minutes.

.2 Discard grout which is not placed within 1 1/2 hours after water is first added.

.2 Placing grout:

.1 Grouting operations shall meet requirements of CAN3-S304 and CAN3 A371.

.2 Grout shall be placed in cells using a grout pump.

.3 Place grout after mortar has set and gained sufficient strength to prevent blowout. Masonry walls to be a minimum of 12 hours old.

.4 Move grout from the mixer to the point of deposit as fast as practical. Pumping shall be used to prevent segregation of the mix and cause a minimum of splatter on surfaces not to be encased in grout.

3.3 GROUT (Cont'd)

.2 (Cont'd)

.5 Vibrate or rod grout during placement to ensure complete filling of the grout space.

.6 Except in the top course of a wall, stop grout 38mm below the top of all masonry lifts.

.7 If required, re-rod or vibrate the grout shortly after it has begun to stiffen to overcome settlement shinkage.

.3 All load-bearing masonry walls shall be grouted as noted on drawings and as follows:

.1 Grout all lintel bond beam block and all vertical cells containing reinforcement.

.2 Grout behind all frames in walls, around all loose and miscellaneous items of steel, and other appurtenances.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

.1 Section 04 05 00 - Common Work Results for Masonry.

.2 Section 04 05 12 - Masonry Mortar and Grout.

.3 Section 04 05 23 - Masonry Accessories.

.4 Section 04 22 00 - Concrete Unit Masonry.

.5 Section 05 50 00 - Metal Fabrications.

1.2 REFERENCES

.1 CAN/CSA-A23.1-09, Concrete Materials and Methods of Concrete Construction.

.2 A370-M94(R1999), Connectors for Masonry.

.3 A371-M94(R1999), Masonry Construction for Buildings.

.4 CSA G30.3-M1983 (R1998), Cold-Drawn Steel Wire for Concrete Reinforcement.

.5 CSA G30.12-M1977, Billet-Steel Bars for Concrete Reinforcement.

.6 CAN3-S304-M04 (R2010), Masonry Design for Buildings.

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

.8 ASTM A 123/A 123M-12 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.9 ASTM A 1011/A 1011M-12b Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

1.3 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Shop Drawings and Other Submittal Procedures.

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

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

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Bar reinforcement: to CSA A371 and CAN/CSA-G30.18, grade 400.

.2 Wire reinforcement: to CSA A371 and CSA G30.3.

.3 Horizontal joint reinforcement: to CAN3-A370.

.4 Connectors: to CSA A370 and CSA S304.1.

.5 Corrosion protection:
.1 Corrosion protection to be CAN3-A370.
.2 For exterior walls, wire ties, anchors, and horizontal joint reinforcement to be hot dipped galvanized.
.3 For interior walls, wire ties, and horizontal joint reinforcement to be industry mill galvanized.

.6 Horizontal reinforcing for exterior walls of concrete block with architectural concrete block veneer: ladder type, composite wall ties, having two continuous horizontal members in the back-up concrete block wythe welded to two continuous horizontal members in the architectural block, extending into cavity beyond insulation line. Reinforcing of ties are to be manufactured of 4.76 mm dia. steel rods, reinforcing side rods are to be manufactured of 4.76 mm dia. steel rods, hot dipped galvanized after fabrication. Length of box ties are to be chosen so that the ties extend to the centre line of the veneer unit.

2.1 MATERIALS (Cont'd)

.7 Horizontal joint reinforcing for single wythe concrete block walls: ladder type. Reinforcing to be manufactured of 3.66 mm steel side rods perpendicular and cross rods spaced at 400mm on center, hot dipped galvanized after fabrication. Overall width to be 50mm less than the nominal thickness of masonry wythe being reinforced.

.8 Anchoring masonry walls to structural members, or concrete foundation walls: adjustable metal bar anchors with triangle ties. Metal bar anchors to be securely anchored to the structural members, or to the existing surfaces. Length of ties to be chosen to penetrate the masonry walls 150 mm minimum when the tie enters the masonry at the end, and to reach the centre of the masonry when the tie enters the masonry from the side. Anchors and ties to be hot dipped galvanized after fabrication.

.9 Vertical reinforcing: steel bar reinforcing in accordance with CAN/CSA-G30.18, sizes as detailed on drawings.

.10 Dowels into concrete supports:
.1 Bar reinforcement: to CAN-A371 and CSA G30.18, Grade 400.
.2 Shrinkage compensating grout for holding dowels in place: as per Section 03 30 00.

2.2 FABRICATION

.1 Fabricate reinforcing in accordance with CAN/CSA-A23.1 and the Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada, unless indicated otherwise.

.2 Fabricate connectors in accordance with A370.

.3 Obtain Departmental Representative's approval for locations of reinforcement splices other than shown on placing drawings.

.4 Ship reinforcement and connectors, clearly identified in accordance with drawings.

PART 3 - EXECUTION

3.1 GENERAL

.1 Do masonry connectors and reinforcement in accordance with A370, A371, CAN/CSA-A23.1/A23.2 and CAN3-S304 unless indicated otherwise.

.2 Prior to placing mortar, obtain Departmental Representative's approval of placement of reinforcement and connectors.

.3 Do additional reinforcement of masonry as indicated.

.4 Accurately place all reinforcement and secure in position prior to grout installation.

.5 Protect reinforcement steel at all times from damage during installation. Ensure it is free from dirt, detrimental scale, paint, latency, mortar, oil and other foreign substances. However, the removal of tight adherent rust or mill scale is unnecessary. Exposed portions of reinforcement bars shall not be subjected to impact or rough handling. Cracked or split bent reinforcement bars shall be cause for the bars to be rejected.

.6 When requested by the Departmental Representative, the Contractor shall notify the Departmental Representative when the horizontal reinforcement in any course has been laid so that the Departmental Representative may inspect the reinforcement before the next course is laid.

.7 Similarly, prior to grouting of vertical cells containing reinforcement, the Contractor shall obtain the Departmental Representative's approval prior to proceeding.

3.2 MASONRY TYING SYSTEMS

.1 Masonry tying system for exterior walls of concrete block with concrete block veneer:

3.2 MASONRY TYING SYSTEMS (Cont'd)

.1 (Cont'd)

.1 Place ladder type composite wall reinforcing in typical concrete block back-up walls at every second bed joint 400 mm O.C. with box ties extending into the cavity. Lap reinforcing as required to ensure continuity.

.2 Use PVC insulation clip to secure cavity insulation.

3.3 HORIZONTAL REINFORCING

.1 Place horizontal reinforcing as follows:

.1 1200mm o.c. for all interior non secure walls.

.2 Lap reinforcing at least 150mm at splices.

.3 Use preformed corner and tee sections to form continuous reinforcing around corners and for anchoring abutting walls and partitions. Material in corner and tee sections shall correspond to type and design of reinforcing used.

.4 Place reinforcing to ensure 15mm mortar cover on the face of exterior walls; 13mm on the face of interior walls.

.2 All reinforcement shall be continuous except that it shall not pass through any vertical masonry control joints.

.3 Bond beam reinforcement to be supplied in single length to suit full wall length. Lap splices permitted only in walls over 12m long.

3.4 VERTICAL REINFORCING

.1 Place vertical reinforcing to spacing and as detailed on drawings. Block cavities to be completely filled with grout where vertical reinforcing is to be placed.

.2 Supply all vertical reinforcement bars in single length to suit full wall height.(floor to floor, and floor to ceiling)

.3 Where splicing is approved by the Departmental Representative, the minimum lap shall be 700mm for 15M bar.

3.4 VERTICAL REINFORCING (Cont'd)

.4 Cut bars as required to ensure proper fit, to the approval of the Departmental Representative.

.5 Place reinforcing in its proper position and secure in place so that it will not be moved during grouting operation. The distance between points at which the reinforcing is secured shall not exceed 1200mm vertical.

3.5 LINTEL AND BOND BEAM REINFORCEMENT

.1 Reinforce masonry lintels and bond beams as indicated. Make joints in lintels and bond beams to match adjacent walls.

.2 Place and grout in accordance with CSA S304.1, and as indicated.

3.6 MASONRY ANCHORING

.1 For anchoring masonry walls to structural members, use masonry anchors as specified, spaced at maximum 400 mm O.C. vertically and at 600 mm O.C. horizontally.

3.7 METAL ANCHORS

.1 Embed bolts and anchors solidly, where required, in grout to develop maximum resistance to design forces.

3.8 BONDING AND TYING

.1 Preform all bonding and tying in accordance with CSA A370, and as indicated below:
.1 Bond intersecting walls using bar anchors spaced at 400 mm O.C. vertically.
.2 Tie masonry walls to steel columns using column anchor straps and ties spaced at 400mm o.c.
.3 Tie masonry veneer to concrete masonry back-up using ties specified. Tie spacing to be 400mm maximum vertically.

3.9 LATERAL SUPPORT AND ANCHORAGE

.1 Do lateral support and anchorage in accordance with CSA S304.1 and as indicated.
.1 All lateral angles to be 100 x 100 x 6 x 300 mm in length, and spaced at 1200mm o.c.

3.9 LATERAL SUPPORT AND ANCHORAGE (Cont'd)

.2 Where masonry walls and partitions bear on concrete walls and slabs, install dowels as indicated. Drill holes in concrete. Place steel dowels of deformed steel reinforcing bars and pack solidly with shrinkage compensating grout to anchor and hold dowels in position.

3.10 CONTROL JOINTS

.1 Stop reinforcement 25 mm short of each side of control joints unless otherwise indicated.

3.11 FIELD BENDING

.1 Do not field bend reinforcement and connectors except where indicated or authorized by 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.

3.12 FIELD TOUCH-UP

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

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 05 00 - Common Work Results for Masonry.

.2 Section 04 05 12 - Masonry Mortar and Grout.

.3 Section 04 05 19 - Masonry Reinforcing and Connectors.

.4 Section 04 22 00 - Concrete Unit Masonry.

.5 Section 05 50 00 - Metal Fabrications.

.6 Section 07 21 12 - Board Insulation.

.7 Section 07 27 10 - Air Barriers.

.8 Section 07 90 00 - Joint Sealing.

1.2 REFERENCES

.1 ASTM D 2240-05(2010), Test Method for Rubber Property - Durometer Hardness.

.2 A371-M04(R2009), Masonry Construction for Buildings.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Masonry flashing: membrane air/vapour material as specified in Section 07 27 10. Splice and seal joints in flashing using mastic as specified. Masonry flashing installation is to be inspected and approved by the Departmental Representative prior to placing of masonry.

.2 Partition fireproofing material: to ASTM C 665, non-combustible, semi-rigid, mineral wool insulation, to thicknesses as required.

.3 Control joint backer rod: Polyethylene foam, joint back-up material to size as required.

.4 Lap adhesive: recommended by masonry flashing manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Install continuous control joint fillers in control joints at locations indicated.

3.2 CONSTRUCTION

.1 Build in flashings in masonry in accordance with A371 as follows:

.1 Install flashings under exterior masonry bearing on foundation walls, slabs, shelf angles, and steel angles over openings. Install flashings under weep hole courses and as indicated.

.2 In cavity walls and veneered walls, carry flashings from front edge of masonry, under outer wythe, then up backing not less than 400 mm, and as follows:

.3 Lap joints 150 mm and seal with adhesive.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 05 00 Common Work Results for Masonry.

.2 Section 04 05 12 Masonry Mortar and Grout.

.3 Section 04 05 19 Masonry Reinforcing and Connectors.

.4 Section 04 05 23 Masonry Accessories.

1.2 REFERENCES

.1 A165 Series-04(R2009) Series (CAN3-A165.1) (CAN3-A165.3) (CAN3-A165.4)-M85 CSA Standards on Concrete Masonry Units.

1.3 ALTERNATIVE MATERIALS

.1 Acceptable Materials: where materials are specified by trade name refer to the Instructions to Bidders for procedure to be followed in applying for approval of alternatives.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Standard concrete block units Type H: to CSA A165 Series-04.
.1 Classification: H/15/A /M, (H/20/A/M for all load bearing block walls).
.2 Size: modular.
.3 Running bond.
.4 Special shapes: provide bull-nosed units for exposed corners. Provide purpose-made shapes for lintels and bond beams. Provide additional special shapes as indicated.
.5 Classification: S/15/C/M except as modified by fire resistance requirements specified below.
.6 Size: modular.
.7 Special shapes: provide bull-nosed units for exposed corners. Provide purpose-made shapes for lintels and bond beams.

2.1 MATERIALS (Cont'd)

.2 Split faced architectural concrete block units Type 1 for general use smooth face, Charcoal, and type 2 for accents use SR0, Split ashlar, colour bark: to CAN3-A165.1-M85 as manufactured by Shaw Brick, or an approved alternate.
.1 Colour to be approved by Departmental Representative.
.2 Classification of body of unit: H/20/A/M to CAN3-A165.1.
.3 Size: modular.
.4 Running bond.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Concrete block units.
.1 Bond: running.
.2 Coursing height: 200 mm for one block and one joint.
.3 Jointing: concave where exposed or where paint or other finish coating is specified.
.4 Clean block faces using soft cloths before mortar hardens rake to 10 mm depth. After completion of block laying fill joints with pointing mortar then point to provide concave joints. Repeat cleaning of faces.

.2 Concrete block lintels.
.1 Install reinforced concrete block lintels over openings in masonry where steel or reinforced concrete lintels are not indicated.
.2 End bearing: not less than 200 mm.

3.2 CLEANING

.1 Standard block: 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