

## **PART 1 - GENERAL**

### **1.1 GENERAL REQUIREMENTS**

- .1 Comply with requirements of Division 1.

### **1.2 RELATED SECTIONS**

- .1 Section 03 30 00 – Cast in Place Concrete.
- .2 Section 04 05 12 – Masonry Mortar and Grout.
- .3 Section 04 05 19 – Masonry Anchorage and Reinforcing.
- .4 Section 04 05 23 – Masonry Accessories.
- .5 Section 04 22 00 – Concrete Unit Masonry.
- .6 Section 07 92 00 – Joint Sealing.

### **1.3 REFERENCES**

- .1 Canadian Standards Association (CSA International).
  - .1 CSA-A165 Series OH, Standards on Concrete Masonry Units.
  - .2 CSA A179-04, Mortar and Grout for Unit Masonry.
  - .3 CSA A371-04, Masonry Construction for Buildings.

### **1.4 SUBMITTALS**

- .1 Product Data.
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Samples.
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit the following samples to the Departmental Representative:
    - .1 One 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.
  - .3 Submit samples for testing to laboratories employing technicians certified/trained in procedures for testing masonry units.
- .3 Manufacturer's Instructions.
  - .1 Submit manufacturer's installation instructions.

### **1.5 QUALITY ASSURANCE**

- .1 Test Reports.
  - .1 Submit certified test reports showing compliance with specified performance characteristics and physical properties.
  - .2 Submit laboratory test reports certifying compliance of masonry units and mortar ingredients with specification requirements.
- .2 Certificates: Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Mock ups.
  - .1 Construct mock ups in accordance with Section 01 45 00 – Testing and Quality Control.

- .2 Construct mock up panel of exterior wall construction 1800 x 1800 mm incorporating exterior metal wall cladding (refer to Division 7), inner wythes of masonry, coursing, jointing, mortar, use of reinforcement, ties, wall insulation, flashings, damp proof course, fluid applied air barrier and workmanship.
  - .3 Mock-up will be used:
    - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
    - .2 For testing to determine compliance with performance requirements.
  - .4 Construct mock up where directed by the Departmental Representative.
  - .5 Allow 24 hours for inspection of mock up by Departmental Representative before proceeding with masonry Work.
  - .6 When accepted by Departmental Representative, mock up will demonstrate minimum standard for this work. Mock up may remain as part of finished work.
- .4 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver materials to job site in dry condition.
- .3 Storage and Protection.
  - .1 Deliver materials to job site in dry condition and handle masonry units so as to prevent soiling and chipping.
  - .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.
  - .4 Deliver cement, lime and mortar ingredients with manufacturer's seals and labels intact. Store under dry conditions. Protect aggregates from weather and inclusion of foreign matter.

#### **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 22 –Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal: paper, plastic, polystyrene, corrugated cardboard, pallets and packaging material, in appropriate on-site containers for recycling in accordance with Waste Management Plan.
- .4 Unused metal materials are to be diverted from landfill to a metal recycling facility acceptable to Departmental Representative.

- .5 Unused or damaged masonry materials must be diverted from landfill to a local facility acceptable to Departmental Representative.

## **1.8 SITE CONDITIONS**

- .1 Ambient Conditions: assemble and erect components when temperatures are above 4 degrees C.
- .2 Weather Requirements: to CSA-A371.
- .3 Site Environmental Requirements.
  - .1 Cold weather requirements.
    - .1 Supplement Clause 6.7.2.1 of CSA A371 with following requirements.
      - .1 Maintain temperature of mortar between 5 degrees C and 50 degrees C until batch is used or becomes stable.
    - .2 Maintain ambient temperature between 5 degrees C and 50 degrees C and protect site from windchill.
  - .4 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.

## **1.9 PROTECTION**

- .1 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.
- .2 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.
- .3 Keep cavities free from excessive mortar, mortar droppings and debris.
- .4 Comply with section 6.7 of CSA A371 for protection requirements for completed masonry not being worked on.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Masonry materials are specified in Related Sections.

## **PART 3 - EXECUTION**

### **3.1 INSTALLERS**

- .1 Experienced and qualified masons to carry out erection, assembly and installation of masonry work.

### **3.2 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

### **3.3 PREPARATION**

- .1 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.
- .2 Bracing approved by Departmental Representative.

### **3.4 INSTALLATION**

- .1 Perform masonry work in accordance with CSA 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.

### **3.5 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 joints concealed in walls and joints in walls to receive plaster, tile, insulation, or other applied material except paint or similar thin finish coating.
- .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.
  - .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 Wetting of Concrete Masonry Units.
  - .1 Do not wet concrete masonry units prior to use.
- .6 Support of loads.
  - .1 Use 25 MPa concrete, Class "N" exposure, to Section 03 30 00 Cast in Place Concrete, where concrete fill is used in lieu of solid units.

- .6 (continued)
  - .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 or grout; keep paper 25 mm back from faces of units.
- .7 Provision for movement.
  - .1 Leave 6 mm space below shelf angles.
  - .2 Leave 25 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.
- .8 Loose steel lintels.
  - .1 Install loose steel lintels. Centre over opening width.
  - .2 Provide polyethylene bond breaker at the underside of shelf angle/top of masonry bearing surface.
  - .3 Affix bond breaker tape to leading edge of shelf angle at bearing location, and caulk masonry to masonry.
- .9 Control joints.
  - .1 Construct continuous control joints as indicated. Maximum spacing 7.6 m for concrete block walls.
- .10 Coordinate mechanical, electrical and food services conduit, wiring, and built-in support items with masonry reinforcement and grouting requirements. Conflicts to be coordinated and resolved to the satisfaction of the Departmental Representative.

### **3.6 SITE TOLERANCES**

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

### **3.7 FIELD QUALITY CONTROL**

- .1 Inspection and testing will be carried out by Testing Laboratory designated by Departmental Representative.
- .2 Cost of testing will be paid by Owner.

### **3.8 CLEANING**

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

### **3.9 PROTECTION**

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

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 GENERAL REQUIREMENTS**

- .1 Comply with requirements of Division 1.

### **1.2 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.

### **1.3 REFERENCES**

- .1 Canadian Standards Association (CSA International).
  - .1 CSA A179-04 (R2009), Mortar and Grout for Unit Masonry.
  - .2 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction / Methods of Tests and Standard Practices for Concrete.

### **1.4 SUBMITTALS**

- .1 Product Data.
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's mortar, grout, parging, colour additives and admixtures.
- .2 Samples.
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit two 190 mm long x joint size samples of mortar.
- .3 Manufacturer's Instructions: provide manufacturer's written instructions for installation.

### **1.5 QUALITY ASSURANCE**

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
  - .1 Submit laboratory test reports in accordance Section 01 45 00 – Testing and Quality Control.
- .2 Certificates: Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-Installation Meeting: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

- .4 Mock-ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 – Testing and Quality Control and requirements of Section 04 05 00 - Common Work Results for Masonry.

#### **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver mortar materials in original unbroken and undamaged packages with the maker's name and brand, and store in shed until used on work.
- .3 Maintain mortar, grout and packaged materials clean, dry and protected against dampness, freezing, traffic and contamination by foreign materials.
- .4 Store or pile sand on plank platform and protect from dirt and rubbish. Store mortar materials and sand to prevent deterioration or contamination by foreign materials.

#### **1.7 SITE CONDITIONS**

- .1 Comply with ambient conditions, minimum and maximum temperature requirements and weather requirements as described in Section 04 05 00 – Common Work Results for Masonry.

#### **1.8 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 22 – Building Construction /Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal: paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site containers for recycling in accordance with Waste Management Plan.

### **PART 2 - PRODUCTS**

#### **2.1 MATERIALS**

- .1 Use same brands of materials and source of aggregate for entire project.
- .2 Mortar and grout: in accordance with CSA A179.
- .3 Use aggregate passing 1.18 mm sieve where 6 mm thick joints are indicated.
- .4 Water: free of deleterious matter and acids or alkalis.

## **2.2 MORTAR TYPES**

- .1 Mortar for exterior masonry above grade:
  - .1 Type S based on Proportion specifications.
- .2 Mortar for foundation walls, pavements, walks, and other exterior masonry at or below grade: type M based on Proportion specifications.
- .3 Mortar for interior masonry.
  - .1 Loadbearing (gravity): type S based on Proportion specifications.
  - .2 Non-Loadbearing: type N based on Proportion specifications.
- .4 Parging mortar: type N based on Proportion specifications.
- .5 Following applies regardless of mortar types and uses specified above:
  - .1 Mortar for grouted reinforced masonry: type S based on Proportion specifications.
- .6 Non-Staining mortar: use non-staining masonry cement for cementitious portion of specified mortar type.
- .7 Grout: to CSA A179, Table 5.

## **2.3 MORTAR MIXES**

- .1 Use pre-blended, pre-coloured mortar prepackaged under factory controlled 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 Use a batch type mixer in accordance with CAN/CSA A179.
- .5 Re-temper mortar only within two hours of mixing, when water is lost by evaporation.
- .6 Use mortar within 2 hours after mixing at temperatures of 32 degrees C, or 2-1/2 hours at temperatures under 10 degrees C.
- .7 Use of anti-freeze compounds including calcium chloride or chloride based compounds is not permitted.
- .8 Do not add air entrainment admixture to mortar mix.

## **2.4 GROUT MIXES**

- .1 Bond beams: grout mix 21 MPa strength at 28 days, 200 – 250 mm slump, premixed type in accordance with CAN/CSA-A179.
- .2 Lintels: grout mix 21 MPa strength at 28 days, 200 – 250 mm slump, premixed type in accordance with CAN/CSA-A179.



- .3 Engineered masonry: grout mix 21 MPa strength at 28 days, 200 – 250 mm slump, premixed type in accordance with CAN/CSA-A179.
- .4 Mix mortar ingredients in accordance with CAN/CSA A179 in quantities needed for immediate use.

## **2.5 GROUT MIXING**

- .1 Mix grout ingredients in quantities needed for immediate use in accordance with CAN/CSA A179.
- .2 Mix batched and delivered grout in accordance with CAN/CSA-A23.1 transit mixed.
- .3 Do not use calcium chloride or chloride based admixtures or other substances used for lowering the freezing point or accelerating setting time.

## **2.6 MIX TESTS**

- .1 Test mortar and grout mixes to requirements of Section 01 45 00 and Section 04 05 00, and in accordance with CAN/CSA A179.

## **PART 3 - EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

### **3.2 CONSTRUCTION**

- .1 Do masonry mortar and grout work in accordance with CSA A179 except where specified otherwise.
- .2 Use mortar within 2 hours after mixing. Retempering shall be permitted.
- .3 Remove excess mortar from grout spaces.
- .4 Work grout into masonry cores to eliminate voids.
- .5 Consolidate grout by rodding during grout installation.
- .6 Do not place reinforcement while placing concrete.
- .7 Grout block work in vertical lifts not exceeding 1200mm. Clean cavity of mortar dropping prior to grouting.
- .8 Grout only block cores containing vertical and horizontal reinforcement unless noted otherwise. Key grout construction joints by stopping grout pour 40 mm below top of masonry unit.

### **3.3 CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .2 Remove droppings and splashings using clean sponge and water.
- .3 Clean masonry with low pressure clean water and soft natural bristle brush.

### **3.4 PROTECTION**

- .1 Cover and completed and partially completed work not enclosed or sheltered with waterproof covering at end of each work day. Anchor covering securely in position.

### **3.5 SCHEDULE**

- .1 Use standard colour mortar for masonry work.
- .2 Grout following masonry components:
  - .1 Interior and exterior block masonry, fill voids containing reinforcement indicated on the drawings.
  - .2 Lintel bond beams.
  - .3 Bond beams at top of block walls.
  - .4 Voids directly under beam bearing plates full height.
  - .5 Block voids at sides of openings, doorways, etc.
  - .6 Space between underside of bearing plate and top of masonry.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 GENERAL REQUIREMENTS**

- .1 Comply with requirements of Division 1.

### **1.2 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 23 - Masonry Accessories.
- .4 Section 04 22 00 – Concrete Unit Masonry.

### **1.3 REFERENCES**

- .1 Canadian Standards Association (CSA International).
  - .1 CAN/CSA-A23.1/A23.2 - 04, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
  - .2 CSA-A370-04 (R2009), Connectors for Masonry.
  - .3 CSA-A371-04 (R2009), Masonry Construction for Buildings.
  - .4 CSA-S304.1-04 (R2010), Masonry Design for Buildings.
  - .5 CSA A179-04 (R2009), Mortar and Grout For Unit Masonry.

### **1.4 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
  - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .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.
- .3 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.

### **1.5 QUALITY ASSURANCE**

- .1 Test Reports: Submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-Installation Meeting: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements

## **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 22 - Construction /Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal: paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site containers for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Bar reinforcement: to CSA-A370 and CAN/CSA G30.18, billet steel, Grade 400 deformed bars.
- .2 Refer to masonry wall reinforcing schedule on structural drawings for size and spacing of typical wall vertical reinforcing. Provide vertical bar at the ends and corners of all walls. Refer to structural details for additional vertical and horizontal reinforcement. Provide minimum lap length of 40 bar diameters for bar reinforcement.
- .3 Wire reinforcement: to CSA-A371 and CSA G30.14, high tensile strength steel wire, truss type, hot dip galvanized after fabrication to ASTM A153, Class B2, 458 g/m<sup>2</sup>.
- .4 Connectors: to CSA-A370 and CSA-S304.
- .5 Corrosion protection: to CSA-S304, to CSA-A370 and CSA-A371.
- .6 Horizontal Reinforcement:
  - .1 Single wythe and solid walls: Acceptable manufacturers:
    - .1 BLOK-LOK Limited.
    - .2 Dur-O-Wal Ltd.
    - .3 or approved equal.
  - .2 Provide prefabricated assemblies for corners and intersections.
  - .3 Refer to masonry wall reinforcement schedule on structural drawings for size and spacing of horizontal joint reinforcement.
  - .4 Provide minimum 500 mm lap. Stagger laps 1200 mm in adjacent courses.
- .7 Ties and Wire Reinforcing: to CSA S304.1 and CSA A370.
- .8 Bar Type Reinforcement: to CSA S304.1.
- .9 Anchor Bolts and Threaded Rods: to CSA S304.1 and conforming to CAN/CSA-G40.21, 300W.
- .10 Steel Plate and Angle: to CAN/CSA-G40.21, Grade 300W.

- .11 Drop-In Expansion Anchors: 16 mm dia. x 65 mm long, Hilti HDI or HDI-L, or approved equal. Install anchors where shown on drawings or as directed by Departmental Representative, to manufacturers written instructions.
- .12 Steel Bar Anchors for Abutting Masonry Walls: 40 mm wide x 4.76 mm standard bar anchors having both ends turned 50 mm unless noted otherwise. Minimum embedment into abutting walls to be 500 mm if wall is parallel to the anchor and 100 mm if perpendicular to the anchor. Place bar anchors at 600 mm maximum centres. Plate to conform to CSA G40.21, Grade 300W. Use same bar anchor (4.76 mm x 40 mm x 500 mm with ends turned 50 mm) where masonry wall abuts against steel column (see typical detail on drawings). Acceptable product: BLT11Z manufactured by Blok-Lok, or approved equal). Grout all cores that contain bar anchors.
- .13 Adhesive anchor system for rebar dowels: Hilti HIT HY 150 MAX. epcon Acrylic 7 or approved equal.

## **2.2 FABRICATION**

- .1 Fabricate reinforcing in accordance with CAN/CSA-A23.1.
- .2 Fabricate connectors in accordance with CSA-A370.
- .3 Obtain Departmental Representative's approval for locations of reinforcement splices other than shown on placing drawings.
- .4 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.
- .5 Ship reinforcement and connectors, clearly identified in accordance with drawings.

## **2.3 SOURCE QUALITY CONTROL**

- .1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcement steel and connectors, showing physical and chemical analysis, prior to commencing reinforcement work.

## **PART 3 - EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

### **3.2 GENERAL**

- .1 Supply and install masonry connectors and reinforcement in accordance with CSA-A370, CSA-A371, CAN/CSA-A23.1 and CSA-S304.1, manufacturer's recommendations, and as indicated.
- .2 Prior to placing mortar or grout, obtain Departmental Representative's approval of placement of reinforcement and connectors.
- .3 Supply and install additional reinforcement to masonry as indicated.

- .4 Spacing of horizontal reinforcing shall be as indicated on drawings.
- .5 Vertical reinforcing steel shall be placed in the centre of the core and not less than one bar diameter between bars. Where splicing is required, the minimum lap shall be 40 bar diameters.
- .6 Replace bars and connectors which develop cracks or splits.
- .7 Where possible run horizontal joint reinforcement continuously. Where required provide minimum lap lengths of 500 mm. Stagger laps in adjacent courses a minimum of 1200 mm.
- .8 Provide additional vertical reinforcing on each side of each opening in masonry walls as shown in typical details. Install dowels of the same size as the vertical reinforcing into the floor or foundation wall as shown on the drawings at each wall vertical reinforcing bar.
- .9 Tie walls to foundations and floor slabs using 15M dowel bars as detailed on the drawings. Coordinate dowels with wall reinforcement placement in centres of grouted cells. All vertical reinforcing must be lapped with a dowel into the foundation or slab.
- .10 At abutting masonry walls, build in standard bar anchors at 600 mm o.c. vertically. Minimum embedment into abutting wall to be 500 mm if wall is parallel to the anchor and 100 mm if perpendicular to the anchor.
- .11 Reinforcing steel shall be handled and sorted in such a manner to keep it free of dirt, mud and water. Any reinforcing steel which is dirty, muddy and/or rusty shall be cleaned with wire brushes and/or shot blasted to the satisfaction of Departmental Representative.
- .12 Place vertical reinforcing in its proper position and secure with reinforcing bar positioners. Maximum spacing of positioners shall not exceed 192 bar diameters, unless shown otherwise on the drawings.
- .13 Place vertical reinforcing at each end of each wall and at all corners.
- .14 Provide additional vertical and horizontal reinforcing at beam bearing points as shown on the drawings.

### **3.3 BONDING AND TYING**

- .1 Bond walls of two or more wythes using metal connectors in accordance with CSA-S304, CSA-A371 and as indicated.
- .2 Tie masonry veneer to backing in accordance with NBC, CSA-S304.1, CSA-A371 and as indicated.

### **3.4 REINFORCED LINTELS AND BOND BEAMS**

- .1 Reinforce masonry lintels and bond beams as indicated.
- .2 Lintels are required for all openings and at locations where one or both face shells have been removed for the purpose of creating an opening or recessed area within the block wall.

- .3 Place and grout reinforcement in accordance with CSA-S304.1, CSA-A371, and CSA-A179.
- .4 Place horizontal beam block reinforcing and stirrups accurately as shown on the drawings. Use full length horizontal reinforcing for all concrete block lintels. Length of horizontal reinforcing for concrete block lintels shall be the opening width plus 400 mm on each side, minimum. Grout all lintels solidly.
- .5 Anchor tops of all masonry walls to various structural elements. Coordinate top of masonry wall anchorage with location of vertical reinforcing as detailed. Provide minimum 200 depth grouted continuous bond beam at the tops of all walls containing 2 – 15M horizontal reinforcing.

### **3.5 GROUTING**

- .1 Grout masonry in accordance with CSA-S304.1, CSA-A371 and CSA-A179 and as indicated.
- .2 Grout all cells containing vertical and horizontal reinforcing. Do not grout cells that do not contain reinforcing except as otherwise indicated.

### **3.6 ANCHORS**

- .1 Supply and install metal anchors as indicated.
- .2 Embed bolts and anchors solidly in mortar or grout to develop maximum resistance to design forces.

### **3.7 LATERAL SUPPORT AND ANCHORAGE**

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

### **3.8 MOVEMENT JOINTS**

- .1 Reinforcement will not be continuous across movement joints. Terminate reinforcement 25 mm short of each side of control joints unless otherwise indicated.

### **3.9 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.

### **3.10 FIELD TOUCH-UP**

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

### **3.11 CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

**PART 1 - GENERAL**

**1.1 GENERAL REQUIREMENTS**

- .1 Comply with requirements of Division 1.

**1.2 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 Reinforcement and Connectors.
- .4 Section 04 22 00 – Concrete Unit Masonry.

**1.3 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM D2240, Standard Test Method for Rubber Property - Durometer Hardness.
- .2 Canadian Standards Association (CSA International).
  - .1 CSA-A371-04 (R2009), Masonry Construction for Buildings.

**1.4 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's for joint fillers and lap adhesives.
- .2 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.

**1.5 QUALITY ASSURANCE**

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-installation Meeting: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

**1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 22 –Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal: paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site containers for recycling in accordance with Waste Management Plan.



## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Control joint filler: closed cell foam to ASTM D1622, compressed 20% when in joint. Acceptable product:
  - .1 "Sof Rod" by Tremco.
  - .2 "Rodofoam" – PR Grade by Sternson Construction Products.
  - .3 "Sealtight Backer Rod" by W.R. Meadows of Canada Ltd.
  - .4 or approved equal.
- .2 Membrane flashing and dampproof course: SBS rubberized asphalt compound, self-adhering type, reinforced with cross laminated polyethylene film, nominal thickness of 1.0 mm (40 mils) thick. Acceptable product:
  - .1 Perm-A-Barrier Wall Flashing by W.R. Grace & Co. of Canada Ltd.
  - .2 Blueskin TWF - Self Adhesive Thru-Wall Flashing Membrane by Monsey Bakor, Inc.
  - .3 or approved equal.
- .3 Lap adhesive: as recommended by membrane flashing manufacturer.
- .4 Flashing back-up: minimum 0.9 mm thick, hot dipped galvanized sheet steel, zinc coating designation Z275.

## **PART 3 - EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

### **3.2 CONTROL JOINTS**

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

### **3.3 MEMBRANE FLASHINGS AND DAMPROOF COURSE**

- .1 Install and build in flashings and dampproof course in exterior masonry walls in accordance with CSA-A371 and as follows:
  - .1 Install flashings under exterior masonry bearing on foundation walls, slabs, at door and window heads, below masonry window sills and horizontal metal sill flashings, shelf angles, and steel angles over openings, and as indicated. Install flashings under weep hole courses at top of foundation walls, immediately above horizontal interruptions and as indicated.
  - .2 In cavity walls and veneered walls, carry membrane flashings from front edge of masonry, under outer masonry wythe, then up backing over vertical membrane air barrier not less than 200 mm. Continuously seal all laps and terminations of membrane flashing.

- .3 Lap dampproof course and membrane flashing joints 150 mm and continuously seal with adhesive.
- .4 Install dampproof course at top of foundation walls and where indicated. Extend dampproof course 25 mm min. beyond exterior face of inner concrete block wythe and continuously seal all laps and terminations.
- .5 Extend flexible membrane flashing 13 mm beyond outside face of wall outside edge of steel lintel. Trim as required to Departmental Representative's instructions.
- .6 Where indicated provide formed metal flashing back-up for support of membrane flashings. Form metal back-up to profile indicated. Secure back-up flashing to supporting work. Provide end dams at each end.

#### **3.4 CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 GENERAL REQUIREMENTS**

- .1 Comply with requirements of Division 1.

### **1.2 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 Reinforcement and Connectors
- .4 Section 04 05 23 - Masonry Accessories.

### **1.3 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CAN3 A165 SERIES, CSA Standards on Concrete Masonry Units.

### **1.4 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 22 – Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal: paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on site containers for recycling in accordance with Waste Management Plan.
- .4 Divert damaged or unused concrete materials from landfill to local facility acceptable to Departmental Representative.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Standard concrete block units: Type S and H, to CAN3 A165 Series (CAN3 A165.1).
  - .1 Classification:
    - .1 Non-load bearing walls: H/15/A/M (hollow units) and S/12.5/C/M (solid units).
    - .2 Load bearing walls: H/20/A/M (hollow units) and S/12.5/A/M (solid units).
  - .2 Size: modular.
  - .3 Colour: "Natural Grey".
  - .4 Special shapes: provide bull nosed units for all exposed corners and soldier courses where indicated on Drawings. Provide purpose made shapes for lintels and bond beams. Provide additional special shapes as indicated.
  - .5 Acceptable material:
    - .1 L.E. Shaw Ltd.
    - .2 Casey Concrete Limited.
    - .3 C & U Belliveau Concrete Products Ltd.
    - .4 or approved equal.

- .2 Fire rated concrete block units: to CAN/CSA-A165 Series CAN/CSA-A165.1 as modified below.
  - .1 Classification: H/15/B/M, and S/12.5/C/M except as modified by fire resistance requirements specified below.
  - .2 Fire resistant characteristics: aggregate used in units and equivalent thickness of units to the Supplement to the National Building Code of Canada 2010, and in accordance with CAN/ULC-S101, for fire-resistance ratings indicated.
  - .3 Size: modular.
  - .4 Special shapes: provide bull-nosed units for exposed corners. Provide purpose-made shapes for lintels and bond beams.

## **2.2 REINFORCEMENT AND CONNECTORS**

- .1 Reinforcement and connectors in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.

## **2.3 FLASHING**

- .1 Flashing: in accordance with Section 04 05 23 - Masonry Accessories.

## **2.4 MORTAR AND GROUT MIXES**

- .1 Mortar and mortar mixes in accordance with Section 04 05 12 - Masonry Mortar and Grout.

## **2.5 TOLERANCES**

- .1 Tolerances for standard concrete unit 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.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- .1 Concrete block units.
  - .1 Bond: running bond and tooth bond at all intersections of walls and partitions.
  - .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. Where concealed, strike joints flush.
- .2 Provide square edge concrete blocks at base of wall at outside corners and at window sills and where indicated. Grind corner of square corner concrete block to form transition to bullnose block.
- .3 Provide bond beam blocks at bottom of interior masonry walls.
- .4 Install horizontal reinforcement and vertical rebar as indicated on structural drawings.

- .5 Machine-cut all exposed masonry units that are adjusted in size.
- .6 Carry all walls up to the underside of construction above and finish against underside of structure and floor slabs above in accordance with details shown on drawings. Leave 25 mm deflection space between block walls and any structure. Pack all voids between top of walls and structure with 150 mm wide strip of semi-rigid mineral wool insulation.
- .7 Cut and make good all openings or chases in new work required by other trades. Where conduits or pipes are in masonry work that is to be left exposed, take special care to ensure that final finish of masonry is presentable; secure the cooperation of other trades to ensure this result.
- .8 Do not form chases in any bearing wall less than 240 mm thick or more than one-third the thickness of any wall of greater thickness and no closer to another chase than 2.0 m except if shown otherwise on drawings.
- .9 Do not use horizontal chases.
- .10 Build in sleeves as required.
- .11 Build in conduits as required without breaking bond.
- .12 Close masonry walls tightly around all penetrations that occur through them in ceiling spaces.
- .13 At all openings in masonry walls, completely fill hollow units with grout at the jambs and reinforce vertically as indicated on Drawings.
- .14 Provide temporary bracing of walls during and after erection until permanent lateral support is in place.
- .15 Install sealant at joints within masonry work and where masonry work abuts other surfaces or materials.
- .16 Do not wet concrete masonry units prior to use.

### **3.2 CONCRETE BLOCK LINTELS**

- .1 Install reinforced concrete block lintels over openings in masonry where steel or reinforced concrete lintels are not indicated. Fill all lintels with grout. Provide end bearing for all lintels as indicated on drawings.
- .2 End bearing: not less than 200 mm.
- .3 Install reinforcing in concrete block where indicated. Grout reinforcing in place.

### **3.3 DOOR FRAMES**

- .1 Grout-in solid all hollow metal door frames in concrete masonry unit walls and partitions.

### **3.4 MOVEMENT JOINTS**

- .1 In concrete block walls, place movement joints at 9.0 m o.c. and where noted on Drawings.

**3.5 CLEANING**

- .1 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**