Part 1 General

1.1 SECTION INCLUDES

.1 Reinforcing steel bars, wire fabric and accessories for other concrete.

1.2 NOT USED

1.3 REFERENCES

.1 ASTM A82/A82M-07 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

.2 ASTM A184/A184M-06(2011) - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.

.3 ASTM A496/A496M-07 - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.

.4 ASTM A497/A497M-07 - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.

.5 CSA-A23.1-09/A23.2-09 - Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.6 CAN/CSA-A23.3-04 (R2010) - Design of Concrete Structures.

.7 CSA-G30.18-09 - Carbon Steel Bars for Concrete Reinforcement.

.8 CSA-G40.20-04/G40.21-04 (R2009) - General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steel.

.9 RSIC (Reinforcing Steel Institute of Canada) – Manual of Standard Practice (2004).

1.4 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Procedures for submittals.

.2 Shop Drawings: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel and wire fabric, bending and cutting schedules, supporting and spacing devices.

1.5 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Procedures for submittals.

.2 Test Reports: Submit certified copies of mill test report of reinforcement materials analysis.

1.6 QUALITY CONTROL

.1 Perform Work in accordance with CSA-A23.1/A23.2. Maintain one (1) copy of document on site.

.2 All Quality Control work shall be performed by an independent firm at the expense of the general contractor.

Part 2 Products

2.1 REINFORCEMENT

.1 Reinforcing Steel, Deformed: CSA-G30.18, billet steel, Grade 400W, weldable bars.

.2 Reinforcing Steel, Plain: CSA-G30.18, carbon steel, Grade 400R, bars, unfinished.

.3 Welded Steel Wire Reinforcement, Plain: ASTM A185/A185M, in flat sheets,

.4 Welded Steel Wire Reinforcement, Deformed: ASTM A497/A497M, in flat sheets, unfinished .

2.2 ACCESSORIES

.1 Tie Wire: Minimum 16 gauge annealed type.

.2 Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapour barrier puncture.

.3 Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel type; size and shape as required.

2.3 FABRICATION

.1 Fabricate concrete reinforcing in accordance with:

.1 CSA-A23.1/A23.2.

.2 RSIC - Reinforcing Steel Manual of Standard Practice.

.2 Locate reinforcing splices not indicated on drawings, at point of minimum stress.

Part 3 Execution

3.1 PLACEMENT

.1 Place, support and secure reinforcement against displacement to CSA-A23.1/A23.2 and as indicated on reviewed placing Drawings.

.2 Do not displace or damage vapour barrier.

.3 Accommodate placement of formed openings.

.4 Maintain concrete cover around reinforcing as noted on the drawings.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Cast-in-place concrete equipment pads, floors and slabs on grade and foundation walls.

1.2 NOT USED

1.3 REFERENCES

.1 ASTM C260/C260M-10a - Standard Specification for Air-Entraining Admixtures for

.2 ASTM C494/C494M-12 - Standard Specification for Chemical Admixtures for Concrete.

.3 ASTM C1017/C1017M-07 - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

.4 ASTM D994/D994M-11 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).

.5 CSA-A23.1-09/A23.2-09 - Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.6 CAN/CSA-A3000-08 - Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.4 SUBMITTALS FOR INFORMATION

.1 Test Data: Minimum four (4) weeks prior to starting concrete work, submit manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:

.1 Portland cement.

.2 Supplementary cementing materials.

.3 Grout.

.4 Admixtures.

.5 Aggregates.

.6 Water.

.2 Certification: Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CSA-A23.1/A23.2.

1.5 QUALITY CONTROL

.1 Perform Work in accordance with CSA-A23.1/A23.2.

.2 Maintain one (1) copy of document on site.

.3 Acquire cement and aggregate from same source for all work.

.4 Conform to CSA-A23.1/A23.2 when concreting during hot weather.

.5 Conform to CSA-A23.1/A23.2 when concreting during cold weather.

Part 2 Products

2.1 CONCRETE MATERIALS

.1 Hydraulic Cement: CAN/CSA-A3000, Type GU; Grey colour.

.2 Blended Hydraulic Cement: CAN/CSA-A3000, Type GUb; Grey colour.

.3 Supplementary Cementing Materials: CAN/CSA-A3000, Natural Pozzolan, Type N.

.4 Fine Aggregates: Normal density aggregates, graded to CSA-A23.1/A23.2; maximum aggregate size 3/8 inch.

.5 Coarse Aggregates: Normal density aggregates, graded to CSA-A23.1/A23.2; maximum aggregate size <Insert Value> inch.

.6 Water: CSA-A23.1/A23.2, clean and not detrimental to concrete.

2.2 ADMIXTURES

.1 Air Entrainment: Air-entraining admixtures are to conform to the requirements of ASTM C260. The admixture is to be of uniform consistency and quality within each container and from shipment to shipment.

.2 Chemical Admixtures: Water-reducing admixtures are to conform to the requirements of ASTM C494, Type A or D. The admixture is to be of uniform consistency and quality within each container and from shipment to shipment.

.3 Superplasticizers (high-range water reducers) are to conform to the requirements of ASTM C494, Type F or G.

2.3 ACCESSORIES

.1 Vapour Retarder: 10 mil thick clear polyethylene film, type recommended for below grade application.

.2 Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 17 MPa in 48 hours and 50 MPa in 28 days.

2.4 JOINT DEVICES AND FILLER MATERIALS

.1 Joint Filler Type A: ASTM D1751, asphalt impregnated fibreboard or felt, thickness as noted on drawings; tongue and groove profile.

.2 Joint Filler Type B: ASTM D1752, Type I - Sponge rubber, resiliency recovery of 90% when compressed to 50% of original thickness, or as required by ASTM D1752.

2.5 CONCRETE MIX

.1 Mix and deliver normal density concrete in accordance with CSA-A23.1/A23.2, properties as specified on drawings.

.2 Use accelerating admixtures in cold weather only when approved by the Departmental Representative. Use of admixtures will not relax cold weather placement requirements.

.3 Use set retarding admixtures during hot weather only when approved by Departmental Representative.

.4 Add air entraining agent to normal weight concrete mix for work exposed to exterior.

Part 3 Execution

3.1 EXAMINATION

.1 Verify all dimensions and locations required on drawings.

.2 Verify requirements for concrete cover over reinforcement.

.3 Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not impede concrete placement.

.4 Verify locations of all openings and embedments required for other mechanical and architectural work.

3.2 PREPARATION

.1 Prepare previously placed concrete by sanding with abrasive wheel and applying bonding agent to manufacturer's written instructions.

.2 In locations where new concrete is dowelled to existing work, drill holes in existing concrete, hole size as recommended by adhesive manufacturer. Install adhesive anchors and let set to manufacturer's specifications.

.3 Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

3.3 PLACING CONCRETE

.1 Place concrete in accordance with CSA-A23.1/A23.2.

.2 Notify Departmental Representative minimum seventy-two (72) hours prior to commencement of operations.

.3 Ensure reinforcement, inserts are not disturbed during concrete placement.

.4 Install vapour retarder under interior slabs on grade. Lap joints minimum 300mm and seal watertight by taping edges and ends.

.5 Repair vapour retarder damaged during placement of concrete reinforcing. Repair with vapour retarder material; lap over damaged areas minimum 6 inches and seal watertight.

.6 Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

.7 Do not interrupt successive placement; do not permit cold joints to occur.

.8 Screed level, maintaining surface flatness to CSA-A23.1/A23.2.

3.4 CONCRETE FINISHING

.1 Finish concrete floor surfaces in accordance with CSA-A23.1/A23.2.

.3 Fine broom finish surfaces which are scheduled to be exposed.

3.5 CURING AND PROTECTION

.1 Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical damage.

.2 Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

.3 Maintain a temperature of 10 degrees Celsius for a minimum of 4 days after placement.

.4 Cure floor surfaces in accordance with CSA-A23.1/A23.2.

.5 Ponding: Maintain 100% coverage of water over floor slab areas continuously for four (4) days.

.6 Spraying: Spray water over floor slab areas and maintain wet cure for seven (7) days.

3.6 FIELD QUALITY CONTROL

.1 Provide free access to Work and cooperate with appointed firm.

.2 Submit proposed mix design of each class of concrete to testing firm for review prior to commencement of Work.

.3 Tests of cement and aggregates may be performed to ensure conformance with specified requirements.

.4 Three (3) concrete test cylinders will be taken and tested for every 100 cu yds or less, of each class of concrete placed.

.1 Minimum one (1) test per day.

.2 One (1) test per type of component, Piers, walls, columns and slabs.

.5 One additional test cylinder will be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.

.6 One slump or flow test and one air test will be taken for each set of test cylinders.

3.7 PATCHING

.1 Allow Departmental Representative to inspect concrete surfaces immediately upon removal of forms.

.2 Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Departmental Representative upon discovery.

.3 Patch imperfections as directed.

3.8 DEFECTIVE CONCRETE

.1 Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

.2 Repair or replacement of defective concrete will be determined by the Departmental Representative.

.3 Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Departmental Representative for each individual area.

END OF SECTION