Part 1 `General

1.1 SECTION INCLUDES

.1 Architectural precast concrete wall panels .

.2 Supports, anchors, and attachments.

.3 Perimeter and intermediate joint seals.

1.2 RELATED SECTIONS

.1 Section 03 30 00 - Cast-in-Place Concrete: Building structural frame.

.2 Section 07 92 00 - Joint Sealants: Perimeter joints with sealant and backing.

1.3 REFERENCES

.1 ASTM A123/A123M- - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM A325M - Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength.

.3 ASTM A666 - Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

.4 CAN/CGSB-1.40 - Anticorrosive Structural Steel Alkyd Primer.

.5 CAN/CGSB-1.181 - Ready-Mixed Organic Zinc-Rich Coating.

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

.7 CSA-A23.3 - Design of Concrete Structures.

.8 CSA-A23.4 - Precast Concrete - Materials and Construction.

.9 CAN/CSA-G40.20/G40.21 - General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.10 CSA-W59 - Welded Steel Construction (Metal Arc Welding).

.11 CSA-W186- - Welding of Reinforcing Bars in Reinforced Concrete Construction.

1.4 PERFORMANCE REQUIREMENTS

.1 Design units to withstand design loads as calculated in accordance with applicable code and erection forces. Calculate structural properties of units in accordance with CSA-A23.3 and CSA-A23.4.

.2 Design units to accommodate construction tolerances, deflection of building structural members and clearances of intended openings.

.3 Design component connections to accommodate building movement and thermal movement. Provide adjustment to accommodate misalignment of structure without unit distortion or damage.

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Shop Drawings:

.1 Indicate layout, unit locations, configuration, unit identification marks reinforcement connection details, support items, location of lifting devices dimensions, openings, and relationship to adjacent materials.

.2 Provide Shop Drawings stamped and signed by a Professional Engineer registered or licensed in the Province of Manitoba.

.3 Samples: Submit two (2) panels, 300 mm in size illustrating surface finish, colour and texture.

1.6 QUALITY ASSURANCE

.1 Perform Work in accordance with:

.1 CSA-A23.1/A23.2 and CSA-A23.3.

.2 CPCI Architectural Precast Concrete Manual.

.2 Welding: CSA-W59 and CSA-W186.

.3 Fabricator and Erector:

.1 Qualified in accordance with CSA-A23.4.

.2 Company specializing in performing the work of this section with minimum 5 years documented experience.

.4 Design units under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

1.7 DELIVERY, STORAGE, AND PROTECTION

.1 Handle precast units to position, consistent with their shape and design. Lift and support only from support points.

.2 Blocking and Lateral Support During Transport and Storage: Clean, non-staining, without causing harm to exposed surfaces. Provide temporary lateral support to prevent bowing and warping.

.3 Protect units to prevent staining, chipping, or spalling of concrete.

.4 Mark units with date of production in location not visible to view when in final position in structure.

Part 2 Products

2.1 MANUFACTURERS

.1 Lafarge Precast

2.2 MATERIALS

.1 Portland Cement: CSA-A3001, Type GU ; White colour for facing mix.

.2 Concrete Materials: CSA-A23.4 CSA-A23.1, water and sand.

.3 Reinforcing Steel Bars: CSA-A23.1.

.4 Forms: to CSA A23.4.

.5 Hardware and miscellaneous materials: to CSA A23.4.

.6 Anchors and supports: to CSA G40.21, Type 400W.

.7 Welding materials: to CSA W47.1-97 and CSA W186-M1997.

.8 Steel primer: to CGSB 1-GP-40M.

.9 Air entrainment admixture: to CSA A266.4.

.10 Shims: steel.

2.3 SUPPORT DEVICES

.1 Connecting and Supporting Devices: CAN/CSA-G40.20/G40.21, carbon steel, Type 300W 350W.

.2 Connecting and Supporting Devices: ASTM A666 stainless steel, Type 304 316.

.3 Miscellaneous Plates, Angles, Inserts: CSA-A23.1/A23.2.

.4 Protective Finish: Prime painted Hot-dip galvanized to ASTM A123/A123M Hot-dip galvanized to Electroplated Unfinished.

.1 Do not paint surfaces in contact with concrete or surfaces requiring field welding.

.5 Bolts, Nuts, and Washers: ASTM A325M high strength steel high strength alloy steel chromium nickel steel alloy.

.6 Prime Paint: CAN/CGSB-1.181, zinc rich CAN/CGSB-1.40, alkyd primer.

.7 Sealant: type specified in Section 07 92 00.

2.4 CONCRETE MIXES

.1 Concrete mix designed to produce a minimum of 35 MPa compressive cylinder strength at 28 days, with a maximum water/cement ratio to CSA A23.4.

.2 Use white cement in facing matrix

.3 Air Entrainment of Concrete Mix: Refer to CSA A23.4

.4 Use of calcium chloride not permitted.

2.5 REINFORCEMENT AND ANCHORS

.1 Add reinforcement in accordance with CSA W.186.70.

.2 Paint anchors after fabrication with zinc rich primer. Touch up anchors with zinc rich primer after welding.

.3 Reinforcing Steel: To CSA G30.16 or CSA G30.12.

2.6 FABRICATION

.1 Fabricate to CSA-A23.4.

.2 Use rigid moulds, constructed to maintain precast unit uniform in shape, size, and finish.

.3 Utilize form liners in accordance with manufacturer's written instructions.

.4 Maintain consistent quality during manufacture.

.5 Fabricate connecting devices, plates, angles inserts, bolts, and accessories. Fabricate to permit initial placement and final attachment.

.6 Cast panels in accurate rigid moulds designed to withstand high frequency vibration. Set reinforcing anchors and auxiliary items as shown on the drawings. Cast in anchors, blocking and inserts supplied by other Sections as required to accommodate their work.

.7 Embed reinforcing steel, anchors, inserts plates, angles, and other cast-in items.

.8 Place recessed flashing reglets continuous and straight.

.9 Locate hoisting devices to permit removal after erection.

.10 Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.

.11 Minor patching in plant is acceptable, providing structural adequacy and appearance of units is not impaired.

2.7 FINISH - PRECAST UNITS

.1 Finish and colour of precast units to match sample in Consultant's office.

.2 Reveal finish: achieve finish using form liners or other mechanical methods.

.3 Smooth finish: as cast using smooth plastic form liners.

.4 Decorative pattern finish as per drawings and details.

.5 Interior panel finish to be smooth steel trowel or smooth form finish.

2.8 FINISH - SUPPORT DEVICES

.1 Galvanize after fabrication to ASTM A123/A123M with 610 gm/sq m gm/sq m coating thickness.

2.9 FABRICATION TOLERANCES

.1 Fabrication Tolerances: CSA-A23.4.

.2 Variation From Dimensions Indicated on Drawings: Plus or minus 3 mm.

.3 Maximum Misalignment of Anchors, Inserts, Openings: 3 mm.

.4 Maximum Bowing of Units: Length of bow/ 360 .

.5 Location of Reglets: 6 mm mm from true position.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that building structure, anchors, devices, and openings are ready to receive work of this section.

3.2 PREPARATION

.1 Provide for erection procedures and induced loads during erection. Maintain temporary bracing in place until final support is provided.

3.3 ERECTION

.1 Erect precast work in accordance with CSA-A23.4.

.2 Erect units without damage to shape or finish. Replace or repair damaged panels.

.3 Erect units level and plumb within allowable tolerances.

.4 Align and maintain uniform horizontal and vertical joints as erection progresses.

.5 When units require adjustment beyond design or tolerance criteria, discontinue affected work; advise Contract Administrator .

.6 Fasten units in place. Perform welding in accordance with CSA-W59 for welding to steel structures and CSA-W186, for welding of reinforcement.

.7 Touch-up field welds and scratched or damaged galvanized surfaces.

.8 Exposed Joint Dimension: 13 mm.

3.4 ERECTION TOLERANCES

.1 Maximum Variation from Plane of Location: 6 mm in 30 m non-cumulative.

.2 Maximum Offset from True Alignment Between Two Connecting Units: 6 mm mm.

.3 Joint Tolerance: Plus or minus 6 mm mm.

3.5 ADJUSTING

.1 Adjust units and secure panels to achieve joint dimensions within tolerances.

3.6 PROTECTION OF FINISHED WORK

.1 Provide non-combustible shields during welding operations.

END OF SECTION