

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 03 20 00 - Concrete Reinforcing.
- .2 Section 03 30 00 - Cast-in-Place Concrete.
- .3 Section 07 92 10 - Joint Sealing.

### **1.2 REFERENCES**

- .1 Canadian Standards Association (CSA)
  - .1 CAN/CSA-A23.1-04, Concrete Materials and Methods of Concrete construction.
  - .2 CAN/CSA-086-01 (R2006), Engineering Design in Wood (Limit States Design).
  - .3 CSA 0121-M1978 (R2003), Douglas Fir Plywood.
  - .4 CSA 0151-04, Canadian Softwood Plywood.
  - .5 CSA 0153-M1980 (R2003), Poplar Plywood.
  - .6 CAN3-0188.0-M78, Standard Test Methods for Mat-Formed Wood Particleboards and Waferboard.
  - .7 CSA 0437 Series-93 (R2001), Standards for OSB and Waferboard.
  - .8 CSA S269.1-1975 (R2003), Falsework for Construction Purposes.
  - .9 CAN/CSA-S269.3-M92 (R2003), Concrete Formwork.

### **1.3 SHOP DRAWINGS**

- .1 Submit shop drawings for formwork and falsework in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework drawings. Comply with CAN/CSA-S269.3 for formwork drawings.
- .3 Indicate formwork design data, such as permissible rate of concrete placement, and temperature of concrete, in forms.
- .4 Indicate sequence of erection and removal of formwork/falsework as directed by Departmental Representative.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.3 SHOP DRAWINGS**  
**(CONT'D)**

- .5 Each shop drawing submission shall bear stamp and signature of qualified professional engineer registered or licensed in Province of Newfoundland and Labrador, Canada.

**1.4 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and the Waste Reduction Workplan.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .4 Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low VOC's.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- .1 Formwork materials:
  - .1 Use formwork materials to CAN/CSA-A23.1.
- .2 Form ties:
  - .1 Removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.
- .3 Form release agent: non-toxic, chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing set of film of concrete in contact with form.
- .4 Falsework materials: to CSA-S269.1.
  - .1 Materials required to bear grade marks, or be accompanied with certificates, test reports or other proof of conformity.

## **PART 2 - PRODUCTS** **(CONT'D)**

### **2.1 MATERIALS** **(CONT'D)**

- .5 Pre-moulded joint fillers:
  - .1 Bituminous impregnated fibreboard to ASTM D1751.
- .6 Bond Breaker:
  - .1 Impermeable tube formed of polyvinylchloride, rubber or similar material to the approval of the Departmental Representative. Internal diameter equal to dowels.
- .7 Sealant: to Section 07 92 10 - Joint Sealing.

## **PART 3 - EXECUTION**

### **3.1 FABRICATION AND ERECTION**

- .1 Verify lines, levels and centers before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.
- .3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .4 Fabricate and erect falsework in accordance with CSA S269.1.
- .5 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1
- .6 Align form joints and make watertight. Keep form joints to minimum.
- .7 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .8 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

**PART 3 - EXECUTION**  
**(CONT'D)**

**3.1 FABRICATION AND ERECTION**  
**(CONT'D)**

- .9 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .10 Clean formwork in accordance with CAN/CSA-A23.1, before placing concrete.

**3.2 REMOVAL AND RESHORING**

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
  - .1 Seven (7) days for walls and sides of beams.
  - .2 Seven (7) days for columns.
  - .3 Five (5) days for beam soffits, slabs, decks and other structural members, or three (3) days when replaced immediately with adequate shoring to standard specified for falsework.
  - .4 Five (5) days for footings and abutments.
- .2 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.
- .3 Provide all necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.
- .4 Space reshoring in each principal direction at not more than 3000 mm apart.
- .5 Re-use formwork and falsework subject to requirements of CAN/CSA-A23.1.

**3.3 JOINT FILLERS**

- .1 Locate and form expansion joints as indicated. Install joint filler in all joints.
- .2 Use 13 mm thick joint filler to separate slab-on-grade and extend joint filler from bottom of slab to within 25 mm of finished slab surfaces unless indicated otherwise.

**PART 3 - EXECUTION**  
**(CONT'D)**

**3.4 JOINT SEALANT**

- .1 Fill expansion and control joints with sealer as per manufacturer's instructions.

**3.5 CONSTRUCTION JOINTS**

- .1 Apply bonding agent to entire face of previously poured concrete prior to commencing adjacent pour.
- .2 Sawcut construction joints to a depth of 25 mm from top of reinforced concrete deck and fill with sealer as per manufacturer's instructions.