

**Part 1 General****1.1 RELATED SECTIONS**

- .1 Section 03 20 00 – Concrete Reinforcing.
- .2 Section 03 30 00 – Cast-In-Place Concrete.

**1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA-O86-09, Engineering Design in Wood.
  - .3 CSA O121-08, Douglas Fir Plywood.
  - .4 CSA O151-09, Canadian Softwood Plywood.
  - .5 CAN/CSA-O325.0-07(R2012), Construction Sheathing.
  - .6 CAN/CSA-S269.3-M92(R2008), Concrete Formwork.
- .2 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

**1.3 SUBMITTALS**

- .1 Submittals in accordance with Section 01 00 10 – General Instructions.
- .2 Submit shop drawings for formwork and falsework.
- .3 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 00 10 – General Instructions.
- .4 Submit method and schedule of construction, shoring, stripping, materials, arrangement of joints, ties, liners, and locations of temporary embedded parts.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Store and manage hazardous materials in accordance with Section 01 00 10 – General Instructions.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling.
  - .2 Place materials defined as hazardous or toxic in designated containers.
  - .3 Divert wood and plastic materials from landfill to a recycling facility as approved by the Departmental Representative.
  - .4 Divert unused form release material from landfill to an official hazardous material collections site as approved by the Departmental Representative.

**Part 2 Products****2.1 MATERIALS**

- .1 Formwork materials:
  - .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121 and CAN/CSA-O86.
  - .2 For concrete with special architectural features, use formwork materials to CSA-A23.1/A23.2.
  - .3 Rigid insulation board: to CAN/ULC-S701.
- .2 Form ties:
  - .1 For concrete not designated 'Architectural', use 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 liner:
  - .1 Plywood: Douglas Fir to CSA O121.
- .4 Form release agent: non-toxic, biodegradable, low VOC.
- .5 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, non-staining,
- .6 Sealant: to Section 07 92 00 -Joint Sealing.

**Part 3 Execution****3.1 FABRICATION AND ERECTION**

- .1 Verify lines, levels and centres before proceeding with formwork 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 formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.
- .5 Align form joints and make watertight. Keep form joints to minimum.
- .6 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .7 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .8 Construct forms for architectural concrete, and place ties as directed.

- .9 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
  - .1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .10 Line forms for following surfaces:
  - .1 Outer face of vertical edge of slab.
  - .2 Secure lining taut to formwork to prevent folds.
  - .3 Pull down lining over edges of formwork panels.
  - .4 Ensure lining is new and not reused material.
  - .5 Ensure lining is dry and free of oil when concrete is poured.
  - .6 If concrete surfaces require cleaning after form removal, use only pressurized water stream so as not to alter concrete's smooth finish.
- .11 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

### **3.2 REMOVAL AND RESHORING**

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
  - .1 Three days for slab on grade.
- .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 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 CSA-A23.1/A23.2.

**END OF SECTION**