



*This section includes form materials; accessories, insulation; required to utilize an engineered finished surface cast-in-place concrete wall forming system with 'stay in place' exposed wall finish.*

*This section includes performance, and descriptive type specifications; edit text to avoid conflicting requirements and add trades names if proprietary specifying is required.*

## **Part 1            General**

### **1.1                SECTION INCLUDES**

*In this article, select the components or assemblies that are intended to be part of the content of this section and will not be included in other sections.*

- .1        Permanent Finished Formwork system for cast-in-place concrete.
- .2        Openings in forms for other work.
- .3        Form accessories.
- .4        Integral wall insulation

### **1.2                RELATED SECTIONS**

*In this article, indicate those sections that inter-rely on this section. The listing below is only partial and should be edited to include those sections specific to the project that describe subjects or products that affect this section directly.*

- .1        Section 03 20 00 - Concrete Reinforcing.
- .2        Section 03 30 00 - Cast-in-Place Concrete: Supply of concrete accessories for placement by this section.
- .3        Section [04 04 15 - Masonry Anchorage and Reinforcement] [\_\_\_\_\_]: Supply of masonry accessories for placement by this section.
- .4        Section 05 50 00 - Metal Fabrications: Supply of metal fabrications for placement by this section.
- .5        Section 06 10 13 – Wood Blocking and Curbing.
- .6        Division 23 - Heating, Ventilating, and Air-Conditioning (HVAC): Supply of mechanical items for placement by this section.
- .7        Division 26 - Electrical: Supply of electrical items for placement by this section.

### **1.3                REFERENCES**

*Edit this article after editing the rest of this section. Only list reference standards below, that are included within the text of this section, when edited for a project specification - delete other references that do not apply.*

- .1        ACI 301-05 - Specification for Structural Concrete for Buildings.
- .2        CSA-S269.1-1975 (R2003) - Falsework for Construction Purposes.
- .3        CAN/CSA-S269.3-M92 (R2008) - Concrete Formwork.
- .4        CSA-A23.1-09/A23.2-09 - Concrete Materials and Methods of Concrete Construction / Methods of Test for Concrete.
- .5        CAN/ULC-S701-05 – Expanded Polystyrene Insulation Board and Pipe Covering



- .6 ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
- .7 CSA-O121-08 - Douglas Fir Plywood.
- .8 COFI (Council of Forest Industries of British Columbia) - Exterior Plywood for Concrete Formwork.
- .9 CFIA (Canadian Food Inspection Agency) approved.
- .10 NSF Potable Water Certified
- .11 NSF/ANSI Standard 61 – Drinking Water System Components Health Effects
- .12 CAN/ULC S102.2 M89 Standard for Surface Burning Characteristics for Flooring, Floor covering and Miscellaneous Materials and Assemblies.

#### **1.4 DESIGN REQUIREMENTS**

*Use this article carefully; restrict statements to identify system design requirements only.*

- .1 Design, engineer and construct formwork, shoring and bracing to conform to [design and] code requirements; resultant concrete to conform to required shape, line and dimension.
- .2 Conform to CSA-S269.1.
- .3 Conform to ACI 301.

*If Fire resistance rating is required – confirm with manufacturer for current evaluations. 100 mm (4 inch) wall system was tested and conforms to requirements for a 2 hour rating.*

*If wall system requires STC rating – confirm with manufacturer for current evaluation. One System configuration has been tested and has STC 54 and an outdoor / indoor OITC of 46. .*

#### **1.5 SUBMITTALS FOR REVIEW**

*The following submittals are intended for review to determine eligibility detailed installation information and final appearance for the project. This formwork system not only retains the concrete but becomes the exposed wall finish and is an engineered system.*

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on form materials [and installation requirements].
- .3 Manufacturer Information:
  - .1 Provide pertinent dimensions, materials, bracing, and arrangement of joints and ties insulation and standard reinforcement temporary support locations.
  - .2 Indicate suggested methods of erection shoring, bracing removal, materials, arrangement of joints, profiles, finishes, ties, liners.
  - .3 Provide formwork information to Design [Engineer] [Consultant] to facilitate shop drawing preparation for other sections of work.

#### **1.6 SUBMITTALS FOR INFORMATION**

*The following submittals are for information only; do not request these submittals if the information submitted will be assessed for acceptability.*

- .1 Section 01 33 00: Submission procedures.



*When manufacturer's written instructions for specific installation requirements are referenced in Part 3 Execution, include the following request for submittal of those instructions. Edit the Part 3 statements to avoid conflict with manufacturer's written instructions.*

- .2 Installation Data: Manufacturer's special installation requirements.
- .3 Maintenance and cleaning procedures.

*Include the following ONLY if specifying for a LEED project. Specify only the technical requirements necessary to achieve the credits desired for this project.*

- .4 Sustainable Design:
  - .1 Section 01 35 18: LEED documentation procedures.
  - .2 Provide required LEED documentation for Product [recycled content] [regional materials] [certified wood].
  - .3 Manufacturer's Certificate: Certify that Products meet or exceed [specified requirements] [\_\_\_\_\_].

## **1.7 QUALITY ASSURANCE**

*In the following paragraph, select one or more of standards that are applicable. Include the last sentence of the following paragraph only when the costs of acquiring the specified standards are justified.*

- .1 Perform Work in accordance with [CSA-S269.1] [ACI 301] [CAN/CSA-S269.3] [Province of [\_\_\_\_\_]] [State of [\_\_\_\_\_]], [Highways] [Public Works' standards].

*Include this article when it is necessary to have formwork structurally designed to withstand superimposed loads, or vertical and lateral forces to which they might be subjected.*

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

## **1.8 MOCK-UP**

*Use this article for assessing full sized erected assemblies for review of construction, coordination of work of several sections, testing, or observation of operation.*

- .1 Section 01 43 00: Requirements for mock-up.
- .2 Provide [<[\_\_\_\_\_] m><<[\_\_\_\_\_] ft>>] long by [<[\_\_\_\_\_] m><<[\_\_\_\_\_] ft>>] wide mock-up of formwork for [\_\_\_\_\_], which includes reinforcement, ties, insulation, accessories, and [\_\_\_\_\_].
- .3 Locate [where directed by Consultant] [\_\_\_\_\_].
- .4 Approved mock-up [may] [may not] remain as part of the Work.

## **1.9 DELIVERY, STORAGE, AND PROTECTION**

*Utilize this article only when void forms are included.*

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Deliver, unload and store void forms, accessories and materials with manufacturer's packaging in tact and follow manufacturer's printed instructions.
- .3 Store off ground in ventilated and protected manner to prevent deterioration and damage.
- .4 Conform to International Standards for Phytosanitary Measures (ISPM No.15) – Regulations of Wood packaging Materials in International Trade 2009



## Part 2 Products

### 2.1 PREFABRICATED FINISHED FORMS

*This article is purposely written for Generic product specification related to Octaform Systems Inc. Edit the following descriptive specifications to identify project requirements and specific engineered requirements. Confirm insulation is required for design*

- .1 Extruded Plastic profile: Rigid PVC, tight fitting modular panel components, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces and meeting the following:
  - .1 Wall thickness: [<100 mm> <<4 inches>>] [<150 mm> <<6 inches>>] [<200 mm> <<8 inches>>] [<250 mm> <<10 inches>>] [<300 mm> <<12 inches>>].
  - .2 Liner thickness: [<50 mm> <<2 inches>>] [<100 mm> <<4 inches>>] [<150 mm> <<6 inches>>] [<200 mm> <<8 inches>>] [<250 mm> <<10 inches>>] [<300 mm> <<12 inches>>].
  - .3 Finish [N2 Gloss], [\_\_\_\_\_].
  - .4 Exposed geometric profile [flat] [corrugated] [octagonal].
  - .5 Colour [white] [grey] [beige].
  - .6 Rigid PVC - type 1 tensile strength 6,650 psi to [ASTM D638], flexural strength 13,000 psi [to ASTM D790].
  - .7 Insulation: rigid Type 2 expanded polystyrene, exceeding [CAN/ULC-S701] [ASTM C578], .minimum [<RSI 0.70 per 25 mm> <<R 4.0 per inch>>], CFC, HCFC, HFC free.
  - .8 Conform to NSF /ANSI Standard 61 and NSF requirements for use in Potable Water Systems.

### 2.2 FORMWORK ACCESSORIES

- .1 Accessories: extruded rigid PVC Trim, [\_\_\_\_\_].

*Include either or both of the following two paragraphs when items are not provided by other sections. Ensure type of slot required is coordinated with the affected section.*

- .2 Dovetail Anchor Slot: Galvanized steel, [<0.8 mm><<22 gauge>>] [<[\_\_\_\_\_] mm><<[\_\_\_\_\_] gauge>>] thick, [foam filled] [non-filled], release tape sealed slots, anchors for securing to concrete formwork.
  - .1 Manufactured by [\_\_\_\_\_]; Product: [\_\_\_\_\_].
- .3 Flashing Reglets: [Galvanized steel] [Rigid PVC], [<0.8 mm><<22 gauge>>] [<[\_\_\_\_\_] mm><<[\_\_\_\_\_] gauge>>] thick, longest possible lengths, with alignment splines for joints, [foam filled] [non-filled], release tape sealed slots, anchors for securing to concrete formwork.
  - .1 Manufactured by [\_\_\_\_\_]; Product: [\_\_\_\_\_].

*Include the following paragraph when items are not provided by other sections under division 6..*

- .4 Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

*Water stops are used in conjunction with formwork in order to compartmentalize the concrete for a placing sequence and to provide a water dam at resultant joints. These devices do not provide a waterproof stop but function as a passive moisture stop.*



- .5 Water stops: [Rubber] [Polyvinyl chloride], minimum [ $<12 \text{ MPa}>><1750 \text{ psi}>>$ ] [ $<[\text{_____}] \text{ MPa}>><[\text{_____}] \text{ psi}>>$ ], tensile strength, minimum  $<46 \text{ degrees C}>><50 \text{ degrees F}>>$  to plus  $<79 \text{ degrees C}>><175 \text{ degrees F}>>$  working temperature range, [ $<[\text{_____}] \text{ mm}>><[\text{_____}] \text{ inch}>>$ ] wide, maximum possible lengths, ribbed profile, preformed corner sections, heat welded jointing.
  - .1 Manufactured by [\_\_\_\_\_]; Product: [\_\_\_\_\_].  
[OR]
- .6 Water stops: Minimum [ $<[\text{_____}] \text{ mm}>><[\text{_____}] \text{ oz}>>$ ] thick, copper, [\_\_\_\_\_] temper; maximum possible lengths.  
[OR]
- .7 Water stops: Preformed mineral colloid strips, [ $<9 \text{ mm}>><3/8 \text{ inch}>>$ ] [ $<19 \text{ mm}>><3/4 \text{ inch}>>$ ] thick, moisture expanding.
- .8 Sealant: [\_\_\_\_\_].

### 2.3 WOOD MATERIALS

*Utilize this article for bracing materials specific to the erection and temporary bracing of permanent forming system in accordance with manufacturer's construction guide.*

- .1 Plywood: [CSA-O121, Douglas Fir] [\_\_\_\_\_] species; [good one side] [select sheathing, tight face] [select sheathing] [sheathing] [medium density overlaid one side] [factory coated] grade; sound undamaged sheets with clean, true edges.
- .2 Lumber: [\_\_\_\_\_] species; [\_\_\_\_\_] grade; with grade stamp clearly visible.

## Part 3 Execution

### 3.1 EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify lines, levels and centres before proceeding with formwork.
- .3 Ensure that dimensions agree with drawings.

### 3.2 ERECTION - FORMWORK

- .1 Erect formwork, shoring and bracing to achieve design requirements, in accordance with manufacturer's installation manual.
- .2 Fabricate and erect false work in accordance with [CSA-S269.1] [ACI 301].
- .3 Provide bracing to ensure stability of formwork. Shore or strengthen formwork bracing subject to overstressing by construction loads.
- .4 Arrange and assemble formwork to permit dismantling and removal of bracing / shoring. Do not damage concrete or permanent form panels. Permit removal of remaining principal shores.
- .5 Align joints and make watertight.
- .6 Obtain approval before framing openings in structural members which are not indicated on Drawings.
- .7 Coordinate this section with other sections of work which require attachment of components to formwork.



### 3.3 INSERTS, EMBEDDED PARTS, AND OPENINGS

- .1 Provide formed openings where required for items to be embedded in passing through concrete work.
- .2 Locate and set in place items which will be cast directly into concrete.

*The following paragraph is a general statement regarding items to be placed in or attached to formwork. Ensure type of device is coordinated with the specific affected section. Location and spacing of these components is critical; require drawings to specifically indicate component position and dimension.*

- .3 Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.

*If specific or special items require placement, the following paragraph illustrates a more specific reference to an appropriate section. Add paragraphs as required.*

- .4 Position recessed reglets for brick veneer masonry anchors to spacing and intervals specified in Section [04 27 13] [\_\_\_\_\_].
- .5 Install accessories in accordance with manufacturer's written instructions, straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- .6 Install water stops to manufacturer's written instructions continuous without displacing reinforcement. [Heat seal joints watertight].

### 3.4 FORM CLEANING

- .1 Clean forms as erection proceeds, to remove foreign matter within forms.
- .2 Clean formed cavities of debris prior to placing concrete.
- .3 Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

*Use the following paragraph if it is expected that erection of formwork will be executed during cold weather.*

- .4 During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

### 3.5 FORMWORK TOLERANCES

*Refer to CSA-A23.1 / ACI 301 for tolerance references. If tolerances are not appropriate, include supplementary statements in this article.*

- .1 Construct formwork to maintain tolerances in accordance with CSA-A23.1 [ACI 301].
- .2 Camber slabs and beams [ $<2 \text{ mm/m} <<1/4 \text{ inch per } 10 \text{ ft}>>$ ] [ $<[_____] \text{ mm/m} <<[_____] \text{ inch per } 10 \text{ ft}>>$ ].

[OR]

- .3 Camber slabs and beams in accordance with ACI 301.

### 3.6 FIELD QUALITY CONTROL

*Only include this article if special field inspection services will be involved. Identify in Section 01 45 00 who provides inspection and testing; owner, owner appointed testing agency, or the contractor.*



- .1 Section 01 45 00: Field [inspection] [testing].
- .2 Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

### **3.7 BRACE / SHORE REMOVAL**

- .1 Do not remove shoring or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- .2 Loosen carefully. Do not wedge pry bars, hammers, or tools against finish surfaces scheduled for exposure to view.
- .3 Clean exposed surfaces following manufacturers recommendations

**END OF SECTION**