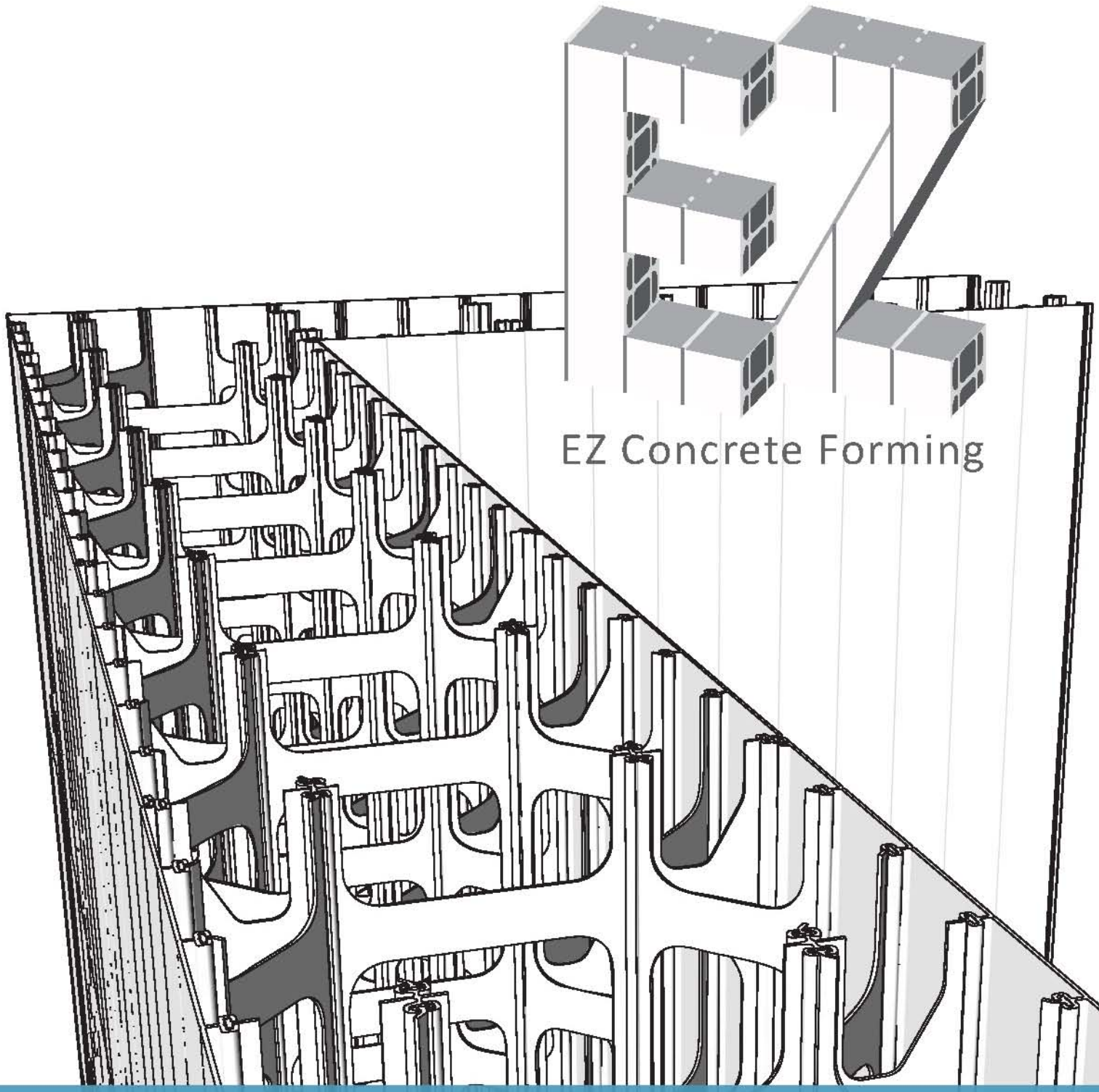


Engineer's Manual

TABLE OF CONTENTS

Detailed Assembly Procedure 2

1 Foundation Requirements 2

2 Assembly of Elements 2

3 Installation of Formwork 3

4 Fabrication and Placement of Reinforcement 5

5 Wall Openings 7

6 Placement of conduit, hardware and other Embedded Items 7

7 Placing of Concrete 9

8 On-Site Quality Control 13

9 Industrial Health and Safety Regulations 15

10 Care and Maintenance Instructions 15

11 Fire Safety Information 16

Detail Drawings 17

Typical Foundation Detail 17

Rafter or Truss Connection to Exterior Wall 18

Typical Door/Window Lintel (pre pour) 19

Typical Door/Window Lintel (post pour) 20

DETAILED INSTALLATION GUIDE

1 FOUNDATION REQUIREMENTS

The primary function of a foundation is to provide a stable base for the building. The foundation distributes the weight of the building and its applied loads over an area of the underlying soil sufficient to prevent unequal settling of the building. A professional engineer should be retained to determine the allowable bearing capacity of the soil during the design of the building.

The building site should be selected for good drainage and a minimum of foundation excavation. Footings should be placed on undisturbed earth in accordance with the design drawings. Footing formwork and reinforcing steel should be inspected by the owner prior to concrete placement.

When EZ form walls are to be placed directly on perimeter spread footings, the concrete surface should be finished level and smooth. Vertical reinforcing steel dowels should be placed to align with the vertical steel reinforcement required in the above grade EZ form wall.

Other footing types may be used but require variations in structural design and assembly procedures.

2 ASSEMBLY OF ELEMENTS

2.1 Delivery to Site

EZ Concrete Forming shall supply formwork to meet the requirements for shape, dimensions and details specified or shown on formwork drawings. It may be advantageous to dimension the building drawings in accordance with the standard EZ form component dimensions.

The EZ form elements required for a building project are selected and assembled for shipment to the project site. The elements are shipped in a stacked arrangement, fitting very compactly together (e.g., a wall 12 ft. in height, 100 ft. in length is shipped in a container approximately 100 cubic feet.)

When the EZ form elements arrive on site, they should not be uncrated until required for assembly. Care should be taken to protect the panels from damage prior to assembly. The panels, until assembled into combined structural elements, could be damaged by improper handling.

WARNING: Do not place heavy objects across component packages, shipping crates or containers, or stack packages on uneven surfaces, as this may deform or damage the contained vinyl panel elements. Do not store panels in misaligned condition, in areas of direct sunlight or other high temperature locations.

2.2 Panel assembly

A flat assembly table for the assembly of EZ Form elements can be made using two plastic pipes of 1.50” diameter, secured at one end to a wood table approximately 40” in height.

Thread 5 or 6 connector elements on the protruding pipe ends and slide the sections over, spacing them approximately 6” apart. Then slide the outside and inside face panels into the grooves of the connector panel to form a completed box section. Continue adding face panels to the

connectors to complete the wall length desired, typically 3 ft. in width. Then slide the completed shell structure out from the pipe supports and stack for later installation or move directly to the prepared footing.

Different wall sections require different EZ Form elements to be assembled. Accordingly, the most efficient assembly procedure may be somewhat different than that described above.

3 INSTALLATION OF FORMWORK

3.1 Scaffolding

EZ Form walls can be either pre-assembled on a flat assembly table in typical 3' sections and then moved into position, or the components can be assembled vertically directly over the prepared footing. In either case, a minimal amount of scaffolding is required to hold the assembled wall sections in position. For walls higher than 16 ft., we suggest a standard 4 ft. wide metal scaffolding available in most areas through equipment rental companies.

Where metal scaffolding is not readily available, wood scaffolding can be used. Care should be taken to ensure that the scaffolding design, construction, erection, maintenance and use are in accordance with provincial health and safety regulations and inspected by the project engineer.

3.2 Scaffolding Set Up

Pre-assembled EZ form wall sections are generally to be set up on cast in place, perimeter strip, concrete footings. Prior to set up of the EZ form sections, a bottom and top wall bracing and alignment system must be installed. (see Assembly Manual)

In order to set up the EZ form bracing system, fasten 2 - 1.5" x 1.5" 24 gauge metal angles or 2" x 4" plates on the footings, spaced apart, to correspond with the width of the forms used (4", 6", 8", or 10"). Following the above, place the EZ form bracing system pipe columns on the inside edge of the footings starting at approximately 10ft. from a corner.

Place the next column 10ft. apart and then brace the column back to the ground with a 45° pipe column strut so that the column will stay securely in place in a vertical position. Proceed to install a second set 10ft. apart in a similar fashion.

If the wall is less than 12 ft. long, use only one extra column and brace it back to the ground with two long stabilizing column struts.

Note: All requirements of the Provincial Industrial Health & Safety Regulations must be met to constitute a safe working platform.

Once all perimeter columns are installed, connect the top rail to the top adjustable bar, perpendicular to the bottom rail. Final adjustments will be made after all the panels are in place and the reinforcing steel is installed.

Before placing the formwork, mark the footing inside of the channel every foot starting at the inside corner. These marks will later be used to align the formwork while placing.

In between this channel, place the EZ form forms from one corner to the next using the gap left between one set of rails and the next.

3.3 Reinforcing Installation.

Once a section of EZ form wall panels, approximately 18 ft. in length, has been installed, the horizontal and vertical reinforcing steel should be installed. (Note: The horizontal reinforcing should be installed first, followed by vertical reinforcing). The horizontal reinforcing can be pushed through the aligned openings in each connector panel. Horizontal steel spacing can be selected as required by the building designer and placed within the appropriate connector panel opening.

Vertical reinforcing steel can be placed from the top of the wall in each EZ form cell as required. When the vertical and horizontal reinforcing steel has been placed, a face panel can be slid up to expose the steel intersections. Reinforcing steel can be tied at these locations or tied to the formwork for proper positioning as required. In corners and intersecting wall locations, bent bars should be placed to provide overlap to the horizontal bars in each direction. At corner locations, the exterior face panels can be removed, exposing the perforated connector panels. Bent bars can then be inserted, and the exterior panels replaced, to complete the reinforced wall.

For walls requiring insulated wall panels, the rigid insulation should be installed prior to the placement of concrete. Rigid insulation panels can be slid into the appropriate slot from the top of the wall.

3.4 Panel Alignment

The location of vertical panels must be positioned such that a vertical joint is centered every 6”. Dimensional checks should be made every foot along the length of the wall and panels should be moved into alignment as required. This can be done by checking the position against the marks on the footing placed before the formwork. This adjustment will evenly distribute the panel joint dimensional tolerances. Once the forms are complete with reinforcing bars, and/or insulation, walls shall be set plumb and perfectly straight by adjustment of the bracing system. When this is completed, placement of the concrete can proceed. The EZ form wall panels have a 1/32” play in each joint. EZ Form also have 3/4”, 1”, 2” 4”, 6” and 12” panels. Consequently almost all dimensional requirements can be met. EZ Form will provide detailed assembly drawings to assist crews in the use of these different spacing requirements.

Note: Any other bracing system or scaffolding can be used to install and support the formwork, but must be approved by a structural engineer.

4 FABRICATION AND PLACEMENT OF REINFORCEMENT

This clause covers the fabrication and placement of reinforcement. The sizes and spacing of the reinforcement, and its concrete cover shall be as shown on the drawings.

4.1 Standard Hooks

The term ‘standard hook” as used herein shall mean:

a) a semicircular bend plus an extension of at least 4 bar diameters but not less than 60 mm at the free end of the bar;

b) a 90° bend plus an extension of at least 12 bar diameters at the free end of the bar; or

c) for stirrup and the anchorage only, either a 90° or 135° bend plus an extension of at least 6 bar diameters, but not less than 60 mm at the free end of the bar.

Note: Hooks for stirrups or lies must have a 135° bend, unless concrete surrounding the hook can restrain the concrete trom spalling. (See CSA Standard A23.3).

4.2 Minimum Bend Diameter

The diameter of the bend measured on the inside of the bar for standard hooks, except stirrup and tie hooks, shall be not less than the values of

TABLE 1
BEND DIAMETER FOR STANDARD HOOKS

	Minimum bend diameter, mm Yield strength, Mpa		
Bar designation	300	400	400+
#10	55	65	60
#15	80	95	90
#20			

4.3 Bending

All bars shall be bent cold, unless otherwise permitted by the Owner.

No bars partially embedded in concrete shall be field-bent, except as shown on the drawings, or as permitted by the Owner.

The bending tolerances shall be sufficiently accurate to comply with the placing and protection tolerances stipulated in Clauses 8, 9 and 10.

4.4 Ties

The size, spacing, and arrangement of ties shall be as shown on the construction drawings.

The ties shall be so arranged that every corner and alternate longitudinal bar shall have lateral support provided by the corner of a tie having an included angle of not more than 135°, and no bar shall be farther than 150 mm clear, on either side, from such a laterally supported bar.

4.5 Spacing of Reinforcement

The clear distance between parallel bars in a layer shall be not less than the diameter of the bars, nor 1-1/3 times the maximum size of the coarse aggregate, nor 25 mm.

In walls and slabs other than concrete joist construction, the principal reinforcement shall be spaced not farther apart than 3 times the wall or slab thickness, nor more than 500 mm.

4.6 Splices in Reinforcement

Splicing of reinforcement shall be made only as permitted by the Owner. To conform to the requirements of this Standard, the locations of such splices shall be indicated on the construction drawings, and the design details shall meet the requirements of CSA Standard A23.3.

4.7 Placing Reinforcement

Reinforcement shall be placed accurately within the tolerances provided in Clauses 8, 9, and 10, shall be adequately supported before concrete is placed, and shall be secured against displacement during pouring.

4.8 Tolerances for Placing Reinforcement

Unless otherwise specified by the Owner, reinforcement, prestressing steel, and post tensioning ducts shall be placed within the following tolerances, but the concrete cover shall in no case be reduced more than one-third of the specified cover:

a) For concrete protection of reinforcement .....+/- 12 mm;

b) Where the depth of a flexural member, the thickness of a wall, or the smallest dimension of column is:

1. 200 mm or less ..... +/- 8 mm;
2. larger than 200 mm but less than 600 mm ..... +/- 12 mm;
3. 600 mm or larger .....+/- 20 mm.

c) Lateral spacing of these bars shall be within +/- 30 mm of the following specified spacing:

1. For longitudinal location of bends and ends of bars ..... +/- 50 mm.

4.9 Concrete Protection of Reinforcement

Concrete cover shall be measured from the concrete surface to the nearest deformation (or surface, for smooth bars or wires) of the reinforcement.

4.10 Cover in a non corrosive Environment

The specified cover for reinforcement in prestressed and non-prestressed concrete shall be not less than as follows:

a) When cast against and permanently exposed to earth.. 75 mm.

b) For:

Exposure to Earth or Weather	Exposed	Not Exposed
1. Beams, girders, columns and piles; principal reinforcement, No. 35 and smaller	50 mm	40 mm
2. Ties, stirrups, and spirals	40 mm	30 mm
3. Slabs, walls, and joists, No. 20 and smaller	30 mm	20 mm
c) The ratio of the cover to the nominal maximum aggregate size shall be at least	1.5	1.0

d) The cover for a bundle of bars shall be the same as that for a single bar with an equivalent area.

5 WALL OPENINGS

Window and door openings in the wall system result in lintels above the openings. These lintels should be framed by 2” preserved wood framing members to serve as the rough opening for the door or window installation. The sides of the openings should be formed with unpunched connector panels.

The lintel must be adequately braced to the footings, from the centre of the lintel, to restrain the weight of poured concrete. The 2” cripples should be screwed in place against the unpunched connector panels with galvanized screws, which will protrude into the concrete area. The bottom sill of a window or door frame must be left open for the installation of concrete. Once the concrete has set and the bracing has been removed, a complete rough-opening frame can be installed to cover the bottom sill which had been left open. We recommend the use of foam insulation and caulking, between the 2” frame and the EZ Form panels, to ensure the water tightness of the assembly.

The above procedure is at this time most widely used, however, alternatives are available in certain other situations.

6 PLACEMENT OF CONDUIT, HARDWARE AND OTHER EMBEDDED ITEMS

This Clause covers the fabrication and placement of hardware for concrete building structures that have been designed in accordance with CSA Standard A23.3. The details and location of this hardware shall be as shown on the drawings.

a) Sleeves, conduits, or other pipes passing through floors, walls, or beams shall be of such size or in such location as not to impair the required strength of the construction; such sleeves, conduits, or pipes may be considered as replacing the displaced concrete structurally in compression, provided they

1. are not exposed to rusting or other deterioration;
2. are of uncoated or galvanized iron or steel not thinner than that specified in ASTM Standard A53;
3. have an inside diameter not exceeding 50 mm; and
4. are spaced not less than 3 diameters on centres.

b) Except when plans of conduits and pipes are approved by the owner, embedded pipes or conduits shall not be

1. larger in outside diameter than one-third the thickness of the slab, wall or beam in which they are embedded;
2. spaced closer than 3 diameters on centres; or
3. so located as to impair the required strength of the structure.

c) Sleeves, pipes or conduits of any material not harmful to concrete, and within the limitations of this Standard, may be embedded in the concrete with the approval of the Owner.

d) Sleeves, pipes or conduits of aluminum shall not be embedded in concrete unless they are effectively coated or covered to prevent aluminum-concrete reaction, or electrolytic action between aluminum and steel.

e) Pipes that will contain liquids, gas or vapor may be embedded in concrete, subject to the following additional conditions:

1. pipes and fittings shall be designed to resist the effects of the material, pressure, and temperature to which they will be subjected;
2. the temperature of the liquid, gas, or vapour shall not exceed 70°C;
3. the maximum pressure to which any piping or fittings shall be subjected shall be 1.4 MPa above atmospheric pressure;
4. immediately prior to concreting, all pipes shall be subjected to a leakage test in which:
    (a) the testing pressure above atmospheric pressure shall be 50% in excess of the pressure to which pipes and fittings may be subjected in service, but not less than 1.0 MPa above atmospheric pressure; and
    (b) the test pressure shall be held for 4 hours with no drop in pressure except that which may be caused by temperature changes;
5. pipes carrying liquid, gas, or vapour that is explosive or injurious to health shall again be tested, after the concrete has hardened;
6. no liquid, gas, or vapour, except water not exceeding 30°C and 0.4 MPa pressure, shall be placed in the pipes until the concrete has attained its design strength;
7. in solid slabs the piping shall be placed between the top and bottom reinforcement, except piping used for radiant heating and snow melting;
8. the concrete covering of the pipes and fittings shall be in accordance with Clause 1(b);

9. reinforcement with an area equal to at least 0.2% of the concrete cross-section shall be provided normal to the piping;
10. the piping and fittings shall be assembled by welding, brazing, solder-sweating, or other equally satisfactory methods, but screw connections shall be prohibited; and
11. the piping shall be so fabricated and installed so that no cutting, bending, or displacement of the reinforcement will be required.

7 PLACING OF CONCRETE

Concrete placing methods and equipment shall be such that the concrete is conveyed and deposited at the specified slump, without segregation, and without changing or affecting the other specified qualities of the concrete.

Concrete placing shall not be started until the owner has inspected and approved: all forms. foundations, reinforcing steel, and methods of mixing, conveying, spreading, consolidating, finishing, curing, and protection of the concrete.

7.1 Handling

Equipment for conveying concrete, such as buckets, trucks, belt conveyors, pumps, etc., shall be of such design, size and condition to ensure a continuous and adequate supply of concrete of the specified mix and slump, without segregation at the point of deposition.

7.2 Depositing

Concrete shall be deposited in the forms as close as practicable to its final position. Lateral movement of concrete, which can cause segregation is not permitted.

Concrete shall be placed in layers that are approximately horizontal. The rate of placing shall be such that each successive lift can be vibrated into the previous lift for proper bonding, but the total depth of plastic concrete shall never exceed that limited by the design of the forms (1.5 m per hour).

When concrete is being placed, it shall not be dropped freely from the end of the chute or elephant trunk more than 1.5 m. If difficulties with reinforcement, such as columns, are encountered, a larger drop height may be allowed if adjustment to the mix is made to improve the mix's cohesiveness and/or the Owner is satisfied that the concrete will not segregate.cThe depositing of concrete shall be a continuous operation until the placing of the section is completed.

Where concrete is to be placed in two or more stages and where a monolithic structure is required, the upper portion shall be placed as soon as the lower portion has stiffened sufficiently. To minimize the accumulation of free water or laitance at this level, the slump of the concrete in the lower portion shall be less than that used in the upper portion. Any free water or laitance shall be removed before the next layer
of concrete is placed. When concrete is placed by pumping, neither excess grout nor mortar used to lubricate pipelines nor wash-out water shall be discharged into the forms.

Note: For most applications, approximately 0.5 m^3 of mortar will be sufficient to adequately lubricate the line

7.3 Consolidation

Concrete, when being placed, shall be compacted thoroughly and uniformly by means of hand-tamping tools, vibrators, or finishing machines to obtain a dense, homogeneous structure, free of cold joints, fill planes, voids, and honeycomb. Formed surfaces shall be smooth and free from large air and water pockets. The concrete shall be well bonded to all reinforcing steel, hardware anchors, waterstops, and other embedded parts.

7.4 Vibration

Internal vibrators (see Table 5) shall be used wherever practicable for consolidating the concrete, having regard to the size and spacing of reinforcement in the form.

TABLE 2
INTERNAL VIBRATORS FOR VARIOUS APPLICATIONS*

Minimum Frequency While Immersed in Concrete, Hz	Diameter of Vibrator Head, mm	Rate of Placement per Vibrator, m^3/h
170 - 250	20 - 40	1 - 4
150 - 225	30 - 60	2 - 8
130 - 200	50 - 90	5 - 15
+ 120 - 180	80 - 150	10 - 30
+ 90 - 140	130 - 180	20 - 40

* From ACI Standard 309R

\+ These vibrators are recommended for use with low-slump concrete containing a maximum size aggregate of more than 40 mm.

Vibrators shall be capable of fulfilling the requirements of Clause 4 with a minimum duration of vibration. A sufficient number of vibrators shall be provided to compact the concrete properly at the rate that it is being placed.

Vibrators shall be placed systematically and at such spacing intervals that the zones of influence overlap, and the vibrator shall penetrate the upper part of the previously placed lift of the concrete by its own mass and vibration.

The vibrator shall be inserted into the concrete in as nearly vertical a plane as possible and shall be withdrawn slowly in a vertical direction to facilitate the removal of entrapped air bubbles.

The vibrator shall be applied, at anyone position, until the concrete is consolidated, but not to the extent that segregation of the concrete will occur.

Note: Superplasticized flowing concrete mixes have a tendency to segregate easily and take less energy to consolidate. Using external vibration and filling the comers of the form first will produce better results.

Vibrators shall be used only for consolidation purposes.

7.5 Concrete Curing and Protection

a) Basic Curing Period

Freshly deposited concrete shall be protected from freezing, abnormally high temperatures, premature drying, and moisture loss for a period of time necessary to develop the desired properties of
the concrete.

Concrete surfaces shall be cured for either 3 days at a minimum temperature of 10°C, or for the time necessary to attain 35% of the specified 28 day compressive strength of the concrete.

b) Additional Curing for Structural Safety

The basic curing period defined in Clause 5(a) shall be extended until the concrete has achieved sufficient strength for structural safety. The compressive strength level required for structural safety shall be specified by the Owner.

7.6 Cold-Weather Placing of Concrete

EZ Form does not recommend placing Concrete at temperatures below freezing.

a) Job Preparation

When the air temperature is at or below 5°C, or when there is a probability of its falling below 5°C within 24 hours of placing (as forecast by the nearest official meteorological office), all materials and equipment needed for adequate protection and curing shall be on hand and ready for use before concrete placement is started. The extent of such preparation shall be in accordance with the requirements of this section. If there is no alternative, a proper mix design must be used.

b) Concrete Temperature

The temperature of the concrete as placed shall be within the limits of 10˚C and 35˚C for walls with a sections of 1’ or thinner. For thicker walls, consult the project engineer for the correct concrete specifications.

Note: The placing temperature should be kept as close as possible to the suggested minimum temperature shown. Higher temperatures result in an increase in mixing water, increased slump loss and an increase in thermal shrinkage.

c) Placing

All snow and ice shall be removed before concrete is deposited on any surface. Calcium chloride, or other deicing salts, shall not be used as a deicing agent in the forms. Concrete shall not be placed on, or against, any surface that will lower the temperature of the concrete in place below the minimum value in clause 6(b).

d) Protection Requirements and Methods

During cold weather as defined in Clause 5(a), adequate protection of the concrete shall be provided for the duration of the required curing period defined in Clause 5(b). Protection shall be provided by means of heated enclosures, coverings, insulation, or a suitable combination of these methods.

1. Heated Enclosures

Enclosures shall be constructed to withstand wind and snow loads and shall be reasonably airtight. The housing shall provide sufficient space between the concrete and the enclosure to permit free circulation of warmed air. Heat shall be supplied to the enclosure by live steam, forced hot air, stationary heaters, or other heaters of various types. At the time of placing and during curing, concrete surfaces shall be protected by formwork or an impermeable membrane from direct exposure to combustion gases or drying from heaters.

Note: The presence of combustion gases within heated enclosures should be prevented through the use of vented heaters.

2. Protective Covers and Insulation

The type of protective cover, and the amount of insulation required to cure concrete properly in cold weather, shall be determined on the basis of the expected air temperature and wind velocity (wind chill factor), the size and shape of the concrete structure, and the amount of cementing material in the concrete mix.

Notes:
(1) The comers and edges of a concrete member are the most vulnerable locations in cold weather, and need more protection than plane surfaces.
(2) When the concrete reaches a compressive strength of 7 MPa, it will normally have sufficient strength to resist early frost damage.

3. Cooling After Protection

To avoid cracking of the concrete due to sudden temperature changes near the end of the curing period, the protection shall not be completely removed until the concrete has cooled to the temperature differential of 12°C between concrete surface and ambient air temperature.

4. Temperature Records

The determination and recording of air and concrete temperatures, to check compliance with the requirement of Clause 6, shall be the responsibility of the owner.

Note: Records should include the date, hour, and location 01 each determination. In cold weather, enclosure temperatures and concrete surface temperatures should be monitored. In hot weather, air temperatures as well as wind velocity and relative humidity data should be noted.

8 ON-SITE QUALITY CONTROL

8.1 Ordering Concrete

When ordering concrete, the following items selected by the Owner shall be specified:

a) the quantity of concrete required;

b) the type of cement and supplementary cementing materials to be used;

c) the required slump at the point of discharge;

d) the normal maximum size of coarse aggregate;
e) the air content for air-entrained concrete;

f) the mix of proportions or the class of exposure;

g) the types of admixtures required;

h) the temperature of the concrete where applicable;

i) the density of the concrete where applicable; and

j) the 28 day compressive strength and/or the water/cementing materials ratio, as required.

8.2 Concrete Quality

Evaluation of concrete quality shall be the responsibility of the Owner. Unlimited access to the work for purposes of inspection and selection of samples shall be available to the Owner at all times.

a) Procedures

Procedures undertaken to assess concrete quality shall be carried out by a testing laboratory certified by an accredited certification agency in accordance with the requirements of CSA Standard A282, or by a testing laboratory accredited by the Standards Council of Canada. In cases where the Owner specifies that field testing procedures are to be carried out by personnel other than those of a certified testing laboratory, such personnel shall possess a certificate or shall otherwise demonstrate to the Owner the necessary competence to carry out this work.

8.3 Sampling Concrete

Samples of concrete for test purposes shall be secured in accordance with CSA Test Method A23.2-1C. When the Owner desires to assess the quality of concrete at a location other than the point of discharge from the delivery equipment, the Owner shall state the point from which the samples shall be taken.

8.4 Slump

a) Frequency and Number of Tests

Sufficient tests shall be made to ensure uniform slump of the concrete. A slump test shall be made with every strength test and every second, or third air test.

b) Test Procedure

Slump tests shall be made in accordance with CSA Test Method A23.2-5C.

8.5 Compressive Strength

a) Standard and Accelerated Strength Tests

For a strength test, two standard 150 x 300 mm test cylinders shall be made. The test result shall be the average of the strengths of the two specimens tested at the same age, except that if either specimen shows definite evidence, other than low strength, of improper sampling, moulding, handling, curing or testing, it shall be discarded and the strength of the remaining cylinder shall be considered the test result.

1. Standard Strength Tests

Cylinders shall be tested at an age of 28 days unless otherwise specified.

2. Compressive Strength Requirements

(a) Standard Cured Cylinders

The strength level of each class of concrete shall be considered satisfactory if the averages of all sets of three consecutive strength tests, for that class at one age, equal or exceed the specified strength, and no individual strength test is more than 3.5 MPa below the specified strength. These requirements shall not apply to field cured specimens.

b) Failure of Tests to Meet Requirements

If the results of tests indicate that the concrete is not of the specified quality, the Owner shall have the right to require one or more of the following:

1. changes in the mix proportions for the remainder of the work;
2. additional curing on those portions of the structure represented by the test specimens that failed to meet specified requirements;
3. nondestructive testing (See Appendix A of CSA Standard A23.2);
4. that cores be drilled from the portions of the structure in question and tested in accordance with CSA Test Method A23.2-14C;
5. load testing of the structure or structural elements in accordance with the requirements of CSA Standard A23.3; and
6. such other tests as the Owner may specify.

9 INDUSTRIAL HEALTH AND SAFETY REGULATIONS

All scaffolds shall be designed, constructed, erected, maintained and used in accordance with the following requirements:

a) Canadian Standards Association: S269.2, “Access Scaffolding for Construction Purposes” and

b) All Provincial Industrial Health and Safety Regulations.

10 CARE AND MAINTENANCE INSTRUCTIONS

The EZ form product is one of the most durable building products materials available today for building applications. In most cases, normal rainfall is sufficient to keep the exterior clean. But if your EZ form structure should need cleaning, the following procedures are recommended. Particular attention on the exterior walls should be given to areas under eaves, porches, awnings, and other overhangs that have limited exposure to the natural washing effect of rainfall.

10.1 Moderate Atmospheric Dirt

An occasional washing with clear water using a garden hose and soft bristled brush is recommended (a long-handled, car-washing brush is ideal for this purpose).

10.2 Heavy Industrial Atmospheric Dirt

Wash in the manner indicated above, but use the following solution:

1/3 cup detergent (e.g. Tide) and 2/3 cup trisodium phosphate (e.g. Soilax) mixed with 1 gallon of water.

10.3 Mildew Accumulation

Mildew can collect on surfaces of all types of building products and is often evident on surfaces that have not been properly cared for and maintained. Normally, mildew will appear as black spots. Mildew is easy to remove by using the basic cleaning solution above with the addition of sodium hypochlorite as follows:

1/3 cup detergent, 2/3 cup trisodium phosphate, mixed with 1 quart of sodium hypochlorite 5% solution (e.g. Clorox) and 3 quarts water.

10.3 Caulking Compounds, Tar and Similar Substances

Use mineral spirits in reasonable amounts and apply directly to the foreign substance. Immediately after cleaning, rinse the area thoroughly with water.

WARNING: ***Do not exceed the recommended concentrations of cleaners. To do so can cause damage to the product's surface. Avoid skin and eye contact with the solution, and in all cases follow manufacturer's instructions for the use of cleaning compounds and solutions. Avoid use of abrasive-type cleaners and strong solvents. Test any cleaner on an inconspicuous area before applying to major areas. To minimize streaking, always clean from the bottom to the top and follow with a rinsing of clear water. Excessive scrubbing is unnecessary and can be harmful to the products, and may cause undesirable glossy areas over the finish.***

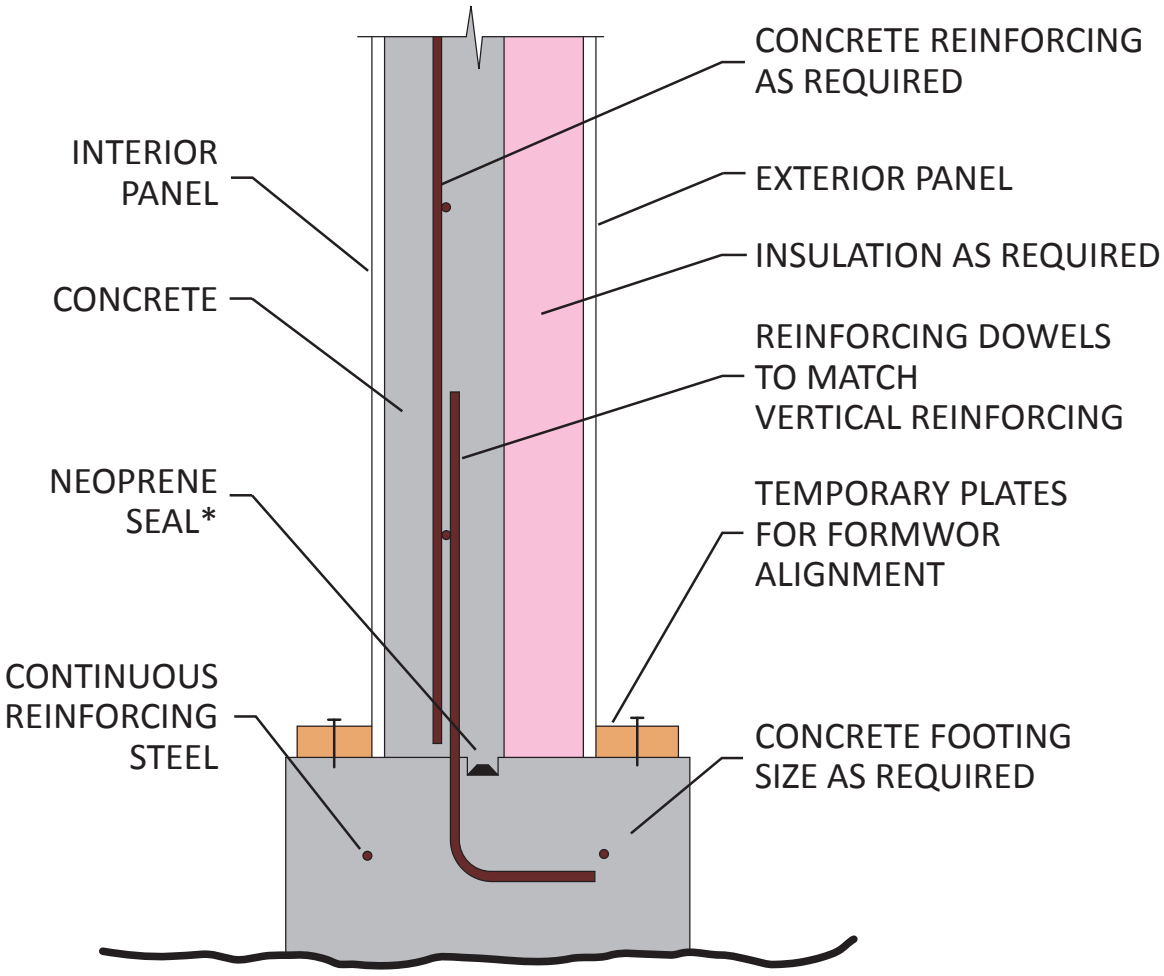
11 FIRE SAFETY INFORMATION

EZ form products require little maintenance for many years. Nevertheless, common sense dictates that builders and suppliers of vinyl products store, handle and install vinyl materials in a manner that avoids damage to the product and/or structure. Owners and installers should take a few simple steps to protect vinyl building materials from fire.

Rigid PVC is made from organic materials and will melt or bum when exposed to a significant source of flame or heat. Normal precautions should always be taken to keep sources of fire, such as barbecues or heaters and combustible materials such as dry leaves, mulch and trash away from the PVC.

TYPICAL FOUNDATION DETAIL

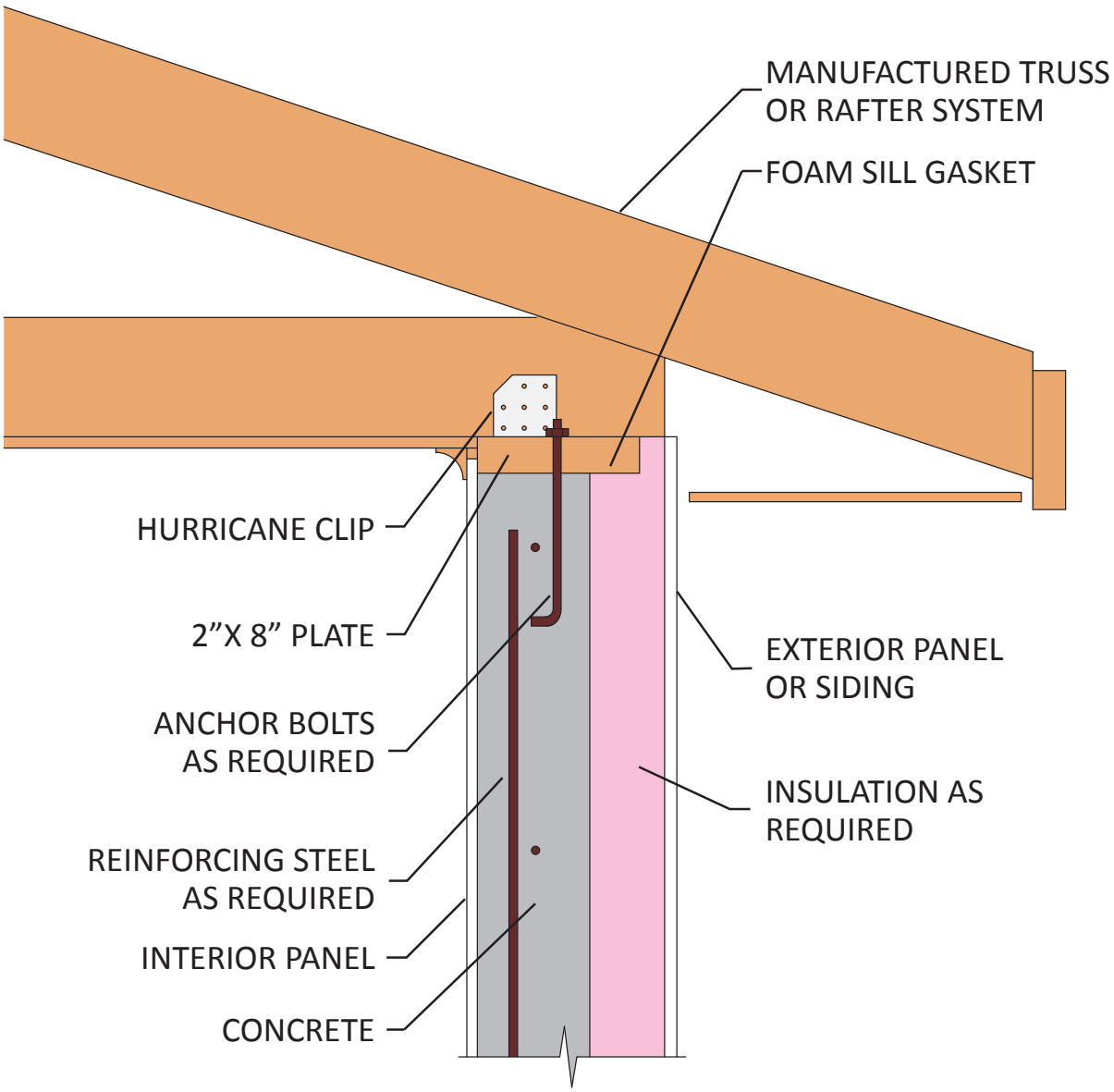
EZ Concerete Forming



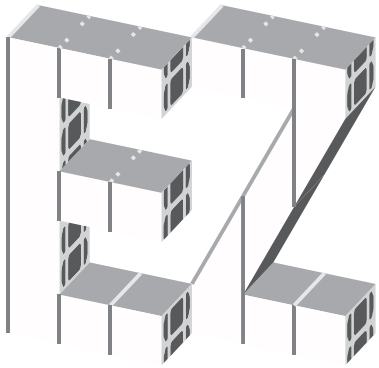
*Only needed for tanks and structures designed to contain water.

RAFTER OR TRUSS CONNECTION TO EXTERIOR WALL

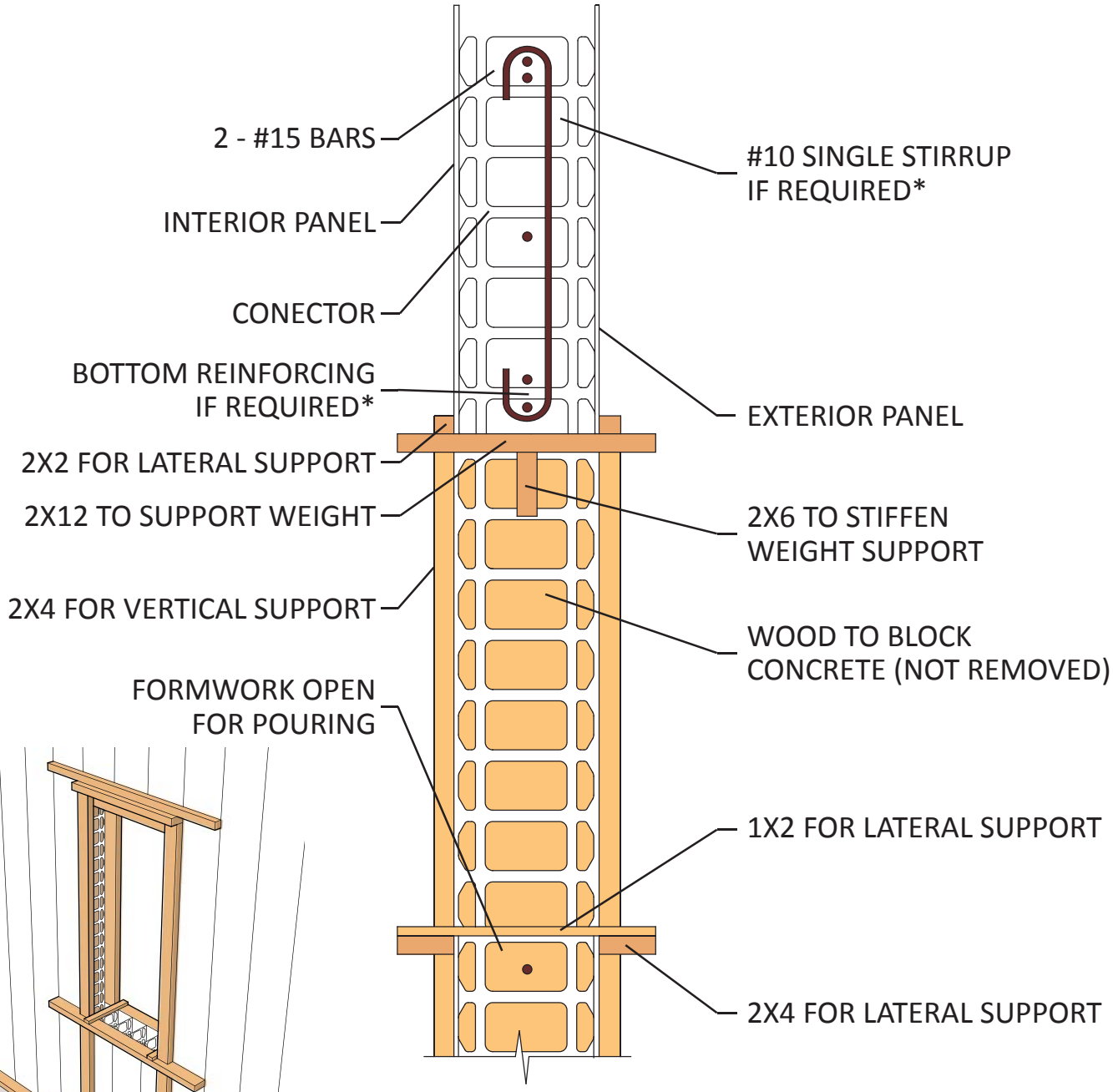
EZ Concerete Forming



TYPICAL DOOR/WINDOW LINTEL (pre pour)

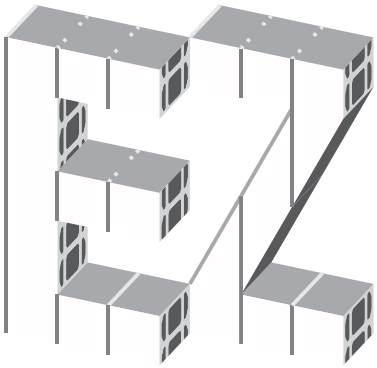


EZ Concerete Forming

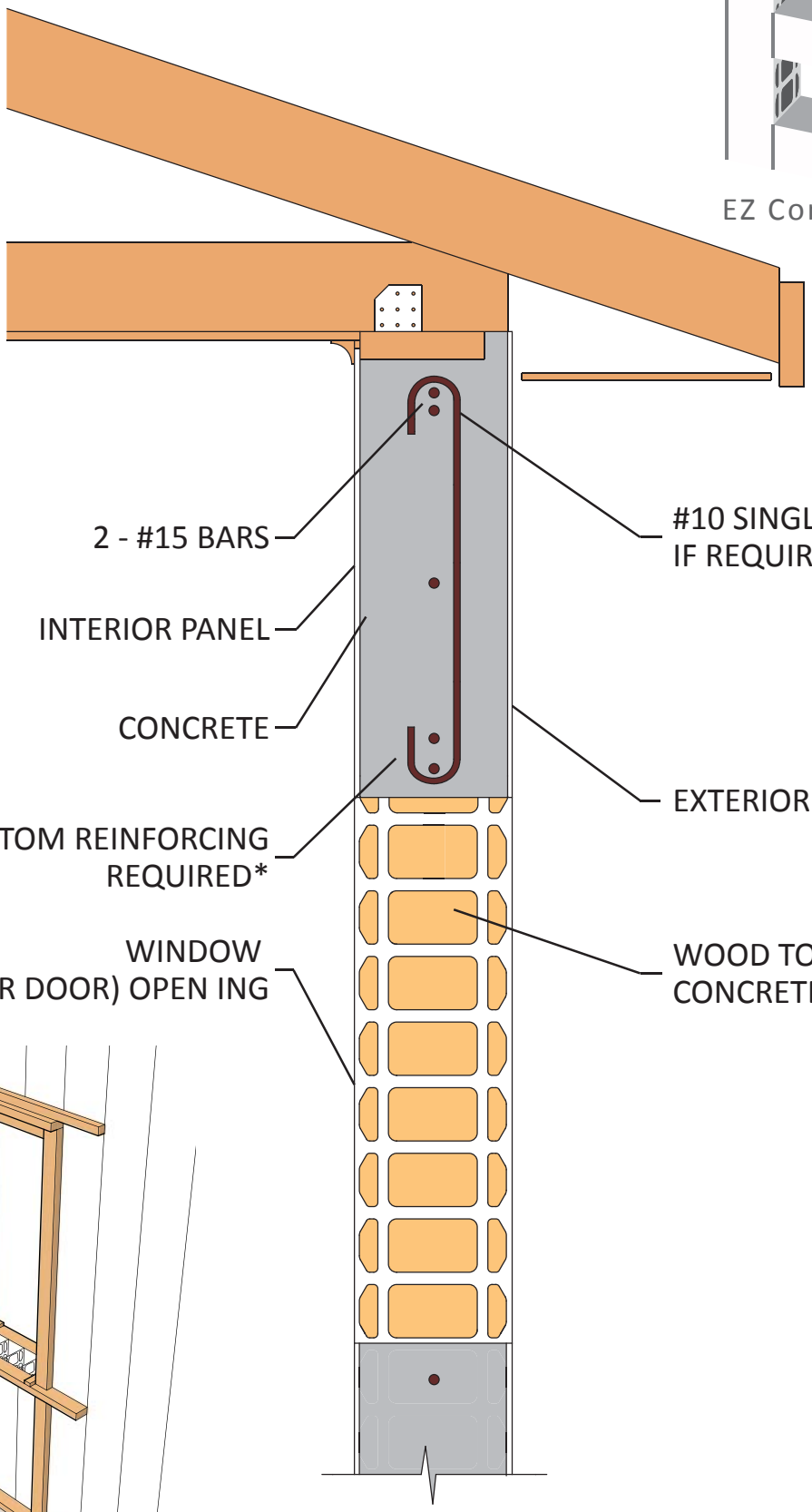


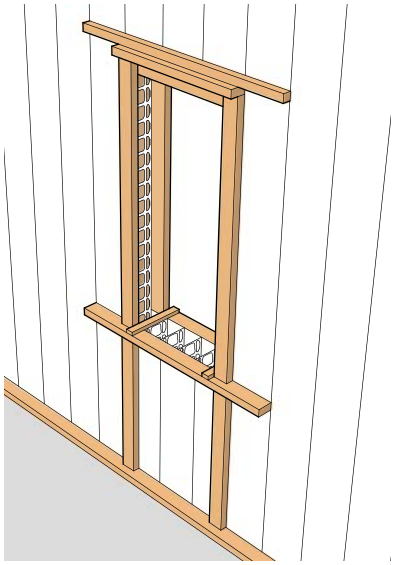
*Refer to the Lintel Load Tables in the Engineering Specifications manual.

TYPICAL DOOR/WINDOW LINTEL (post pour)



EZ Concerete Forming





*Refer to the Lintel Load Tables in the Engineering Specifications manual.

Outline Specifications For EZ Concrete Formwork:

1. EZ Concrete Forming system has been designed in accordance with requirements of CAN/CSA-S269.3 M92. "Concrete Formwork"

2. Design Capacity of EZ Concrete wall system is 57 kPa, based on a Rate of Concrete Placement of 3.0 m/hour at a concrete temperature of 20 (degrees) C.

3. Concrete formwork to be installed in accordance with EZ Concrete Forming assembly instructions.

4. Concrete and reinforcing steel placement to be in accordance with the building design structural engineer's specifications.

5. EZ Concrete wall system formwork installation shall be supervised by a qualified supervisor experienced in the construction of temporary support structures and the use of EZ Concrete

6. Bracing and lateral support structural details necessary to maintain lateral stability and resist sideways and racking shall be designed and specified by the building design structural engineer.

7. The structural engineer for the building design shall be responsible for al field designs, details and changes including the effect they may have on the original design. Field designs and changes must be documented and must be available at the site before and during placement of concrete or other significant loading of the formwork or falsework.

Tests and Reports (available upon request)

ITS - Pilot Fire Test
ITS - Flame Spread Test
ITS - Water Tightness Test
ITS - Flammability Test
ITS - Ignition Temperature Test
ITS - Thermal Analysis
ITS - UBC Section 802.1
Chemical Resistance of PVC
Behavior of PVC Encased Concrete Walls

Vinyl Test - UL Yellow Card
Physical Properties of PVC Elements
Bending Moment Interaction Diagram
Painting and Staining of Vinyl
Adhesive Selection Guide

EZ Concrete Forming Systems Ltd.

9 Semana Crescent
Vancouver, B.C. V6N 2E1
Canada

p: 604.733.2597
f: 604.733.2545
c: 604.780.1702

info@ezconcreteforming.com
www.ezconcreteforming.com

EZ Concrete Forming