

PRECAST CONCRETE WALL PANELS



**Combine the Savings of a Precast
Wall Panel with the Strength,
Security, and Beauty of Durable
Concrete Wall Panels**

PRECAST CONCRETE WALL PANELS

General Description

A unique ribbed interior pattern cuts the weight more than half compared to a solid concrete panel. A typical 8-inch panel weighs roughly the same as a 3¾-inch-thick solid slab.

Wall Panels are designed for use as bearing walls using Metal Building Structural Systems. They may also be used as curtain walls, either full-height or partial height (i.e. wainscoat applications) with a wide range of Metal Building Structural Systems.

Typical panels are 8 feet wide. Vertical ribs are spaced 24 inches with horizontal ribs crossing at 48-inch intervals. The skin is 2 inches thick. The six-inch ribs bring the total overall thickness to 8 inches. Welded wire fabric is positioned at the mid-thickness of the skin. Reinforcing bars are located in each vertical and horizontal rib. Additional reinforcing bars may be located near the outside of each vertical rib when required for unusually severe loading conditions. Wall Panels are designed to meet the load requirements in accordance with applicable code provisions. The adequacy of this type of ribbed panel is recognized by the international Conference of Building Officials in Technical Report No. PFC-3652.

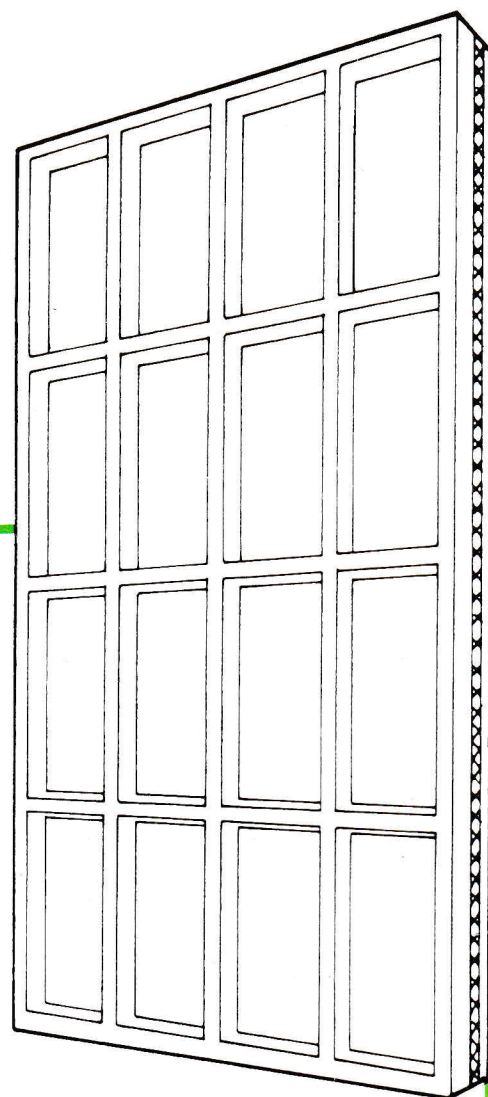
Two basic types of panels are used. The more typical panel has a continuous ribbed pattern throughout its total height. This panel is used for relatively light concentrated vertical loads.

The other type panel does not have the ribbed pattern at the top 2 to 4 feet. This solid portion permits structural connections to be conveniently located across the width of the panel.

The solid portion also spreads concentrated loads across the panel

width, increasing the vertical load carrying capacity. This panel is typically used to support rafters that deliver concentrated vertical loads. It's also used to create a flat inside surface for parapet walls that project above the roof surface.

Wall Panels are delivered to the job site ready for immediate erection off the truck. Embedded plates are pre-installed in the panels for convenient attachment of structural components by field welding. The panels are positioned on the wall foundation and attached with anchors installed through holes formed in the bottom rib of the panel. Adjacent panels are joined with horizontal bolts passing through matching holes in the vertical side ribs of the panels. Minimal bracing is required to support the panels until the building structural framing is in place. The ease of connection and relative light weight of the panels makes erection both efficient and fast. Sealant is placed between the panels to weatherproof the joint.



The inside of a Wall Panel can be left exposed or covered with many types of conventional interior wall finishes. The recesses created by the ribbed pattern are well suited to the installation of insulation up to 6 inches in thickness. The panel recesses also provide convenient locations for recessed boxes.

Available Panels

Available Panels		
Heights	8 to 24 feet 8 to 28 feet	With full ribbed pattern With solid top portion
Panel Weights		3000 lb. for 8 feet high 9000 lb. for 24 feet high 14000 lb. for 28 feet high
Exterior Finishes		Troweled smooth finish Light to coarse broom finish Rough rolled finish Highlighted accent band Exposed aggregate

Design

Wall Panels are designed to support combinations of loads as specified by the governing Code bodies. The designs conform to applicable portions of the Building Code Requirements for Reinforced Concrete (ACI Standard 318).

Fabrication

Wall Panels are manufactured to exact specifications using strict quality-control procedures during all phases of the operation.

Erection

All erection is the responsibility of the contractor. Panels must be carefully handled using properly positioned and secured lifting devices. Sufficient erection bracing must be installed to insure safety and stability until all structural components are in place.

Wall Openings

Rough wall openings are provided in the Panels at required locations of pedestrian doors and windows.

Foundations

Foundations are to be designed by others to accommodate and withstand all of the loads transmitted by the wall system as well as the loads from the structural framing system. Foundations should be reinforced concrete or other suitable material, designed with due regard for soil conditions at the site. In addition, all necessary embedded anchors for wall or structural framing systems must be properly sized and positioned in the concrete.

Material Specifications*

Concrete Normal weight concrete having a 28-day compressive strength between 3000 and 5000 psi based on design requirements.

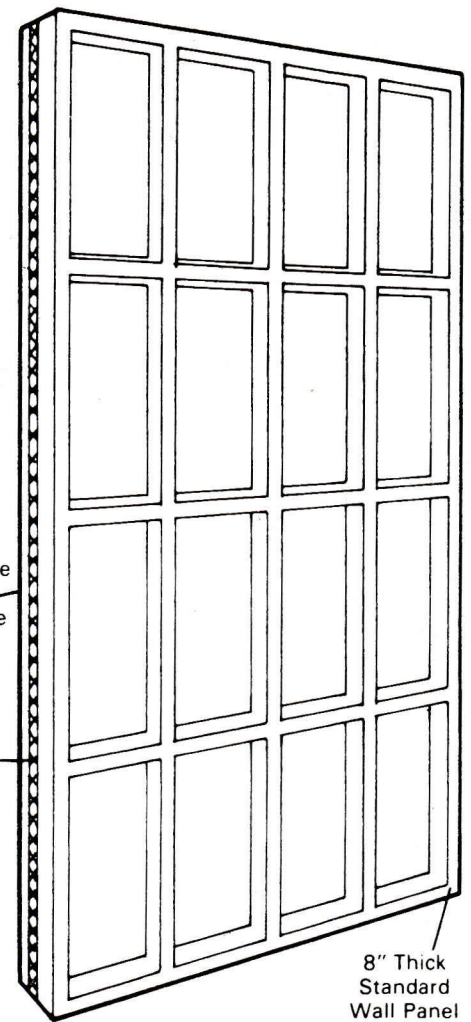
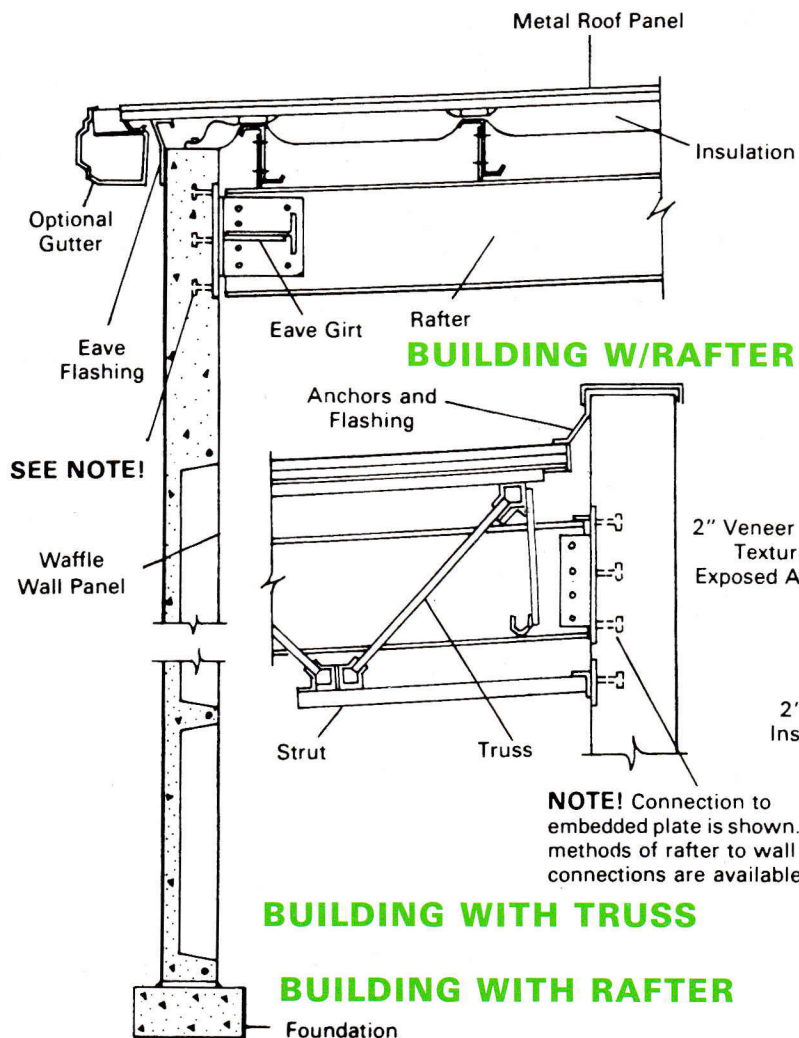
Reinforcing Bars Numbers 4,5,6 or 7 bars based on design requirements conforming to ASTM A 185.

Welded Wire Fabric 6 x 6 - W2.9 x W2.9 conforming to ASTM A 185.

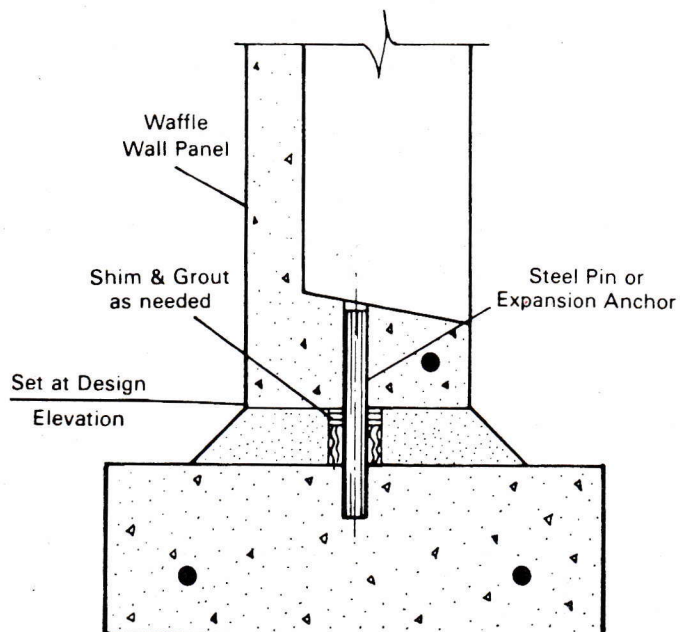
Structural Framing Systems Refer to Product Data Bulletins describing available structural framing systems for details.

FEATURE	BENEFIT TO BUILDER	BENEFIT TO CLIENT
PRECAST REINFORCED CONCRETE		LOWER INSURANCE COSTS FIRE RESISTANCE SECURITY LOW MAINTENANCE IMPACT RESISTANCE
UNIQUE RIBBED SLAB DESIGN	LESS CONCRETE	LOWER COST
LESS WEIGHT	EASIER HANDLING	LOWER COST
INTERIOR FINISH FLEXIBILITY	LOWER INSTALLATION COST	LOWER COST/MORE OPTIONS
CUSTOM EXTERIOR FINISH	LOWER EXTERIOR FINISH COST	DURABLE - ATTRACTIVE LESS MAINTENANCE
FACTORY CASTING	QUALITY CONTROL NO PRODUCTION PROBLEMS FAST TRACK APPROACH REDUCED WEATHER CONDITIONS SMALL PROJECT FLEXIBILITY	QUALITY CONTROL LOWER COST LOWER FINANCING COST QUICKER OCCUPANCY LOWER COST - SMALL PROJECT
ICBO RECOGNITION	CODE RECOGNITION	QUICKER PROJECT APPROACH
DEL ZOTTO SYSTEM APPROACH	SINGLE SOURCE RESPONSIBILITY CONSISTENT PRICING LESS DETAILING REDUCE COORDINATION PROBLEMS	BETTER COORDINATION LOWER COST LOWER COST HIGHER QUALITY

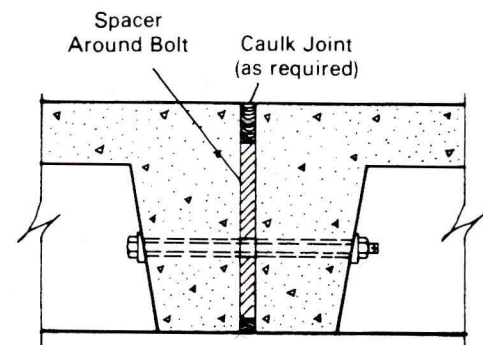
*Use of alternate materials & design details may be revised without prior notice.



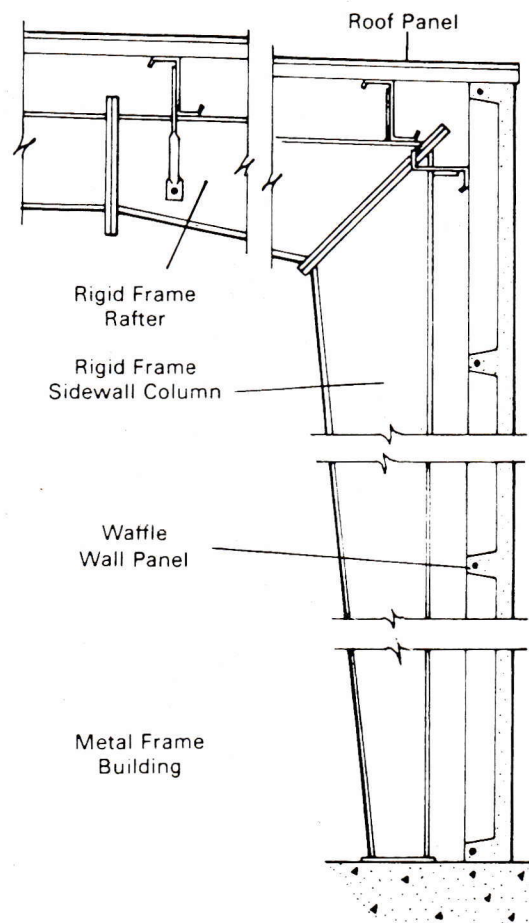
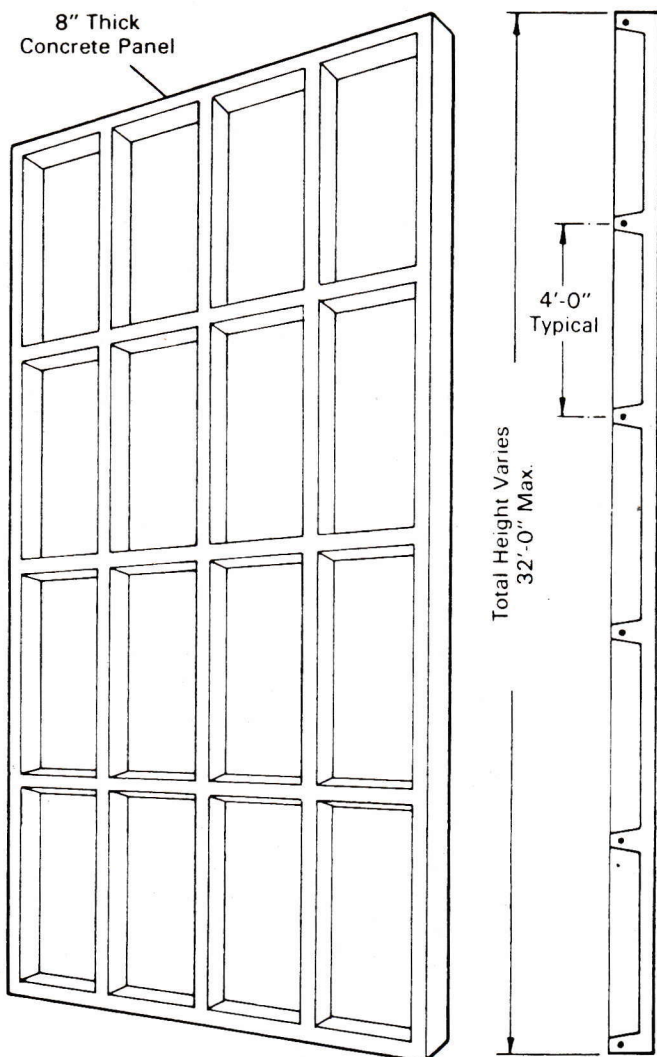
CONCRETE SANDWICH INSULATED WALL PANEL



WALL TO FOUNDATION

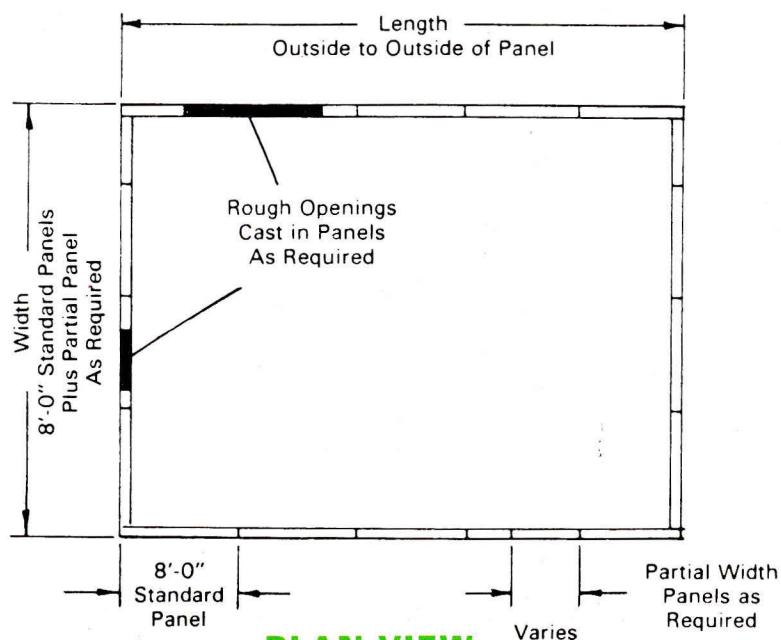
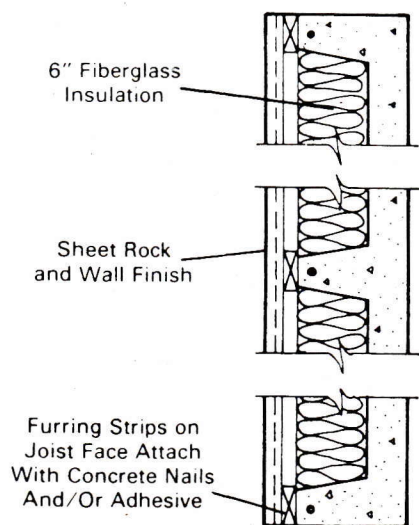


PANEL CONNECTION DETAIL



CURTAIN WALL APPLICATION

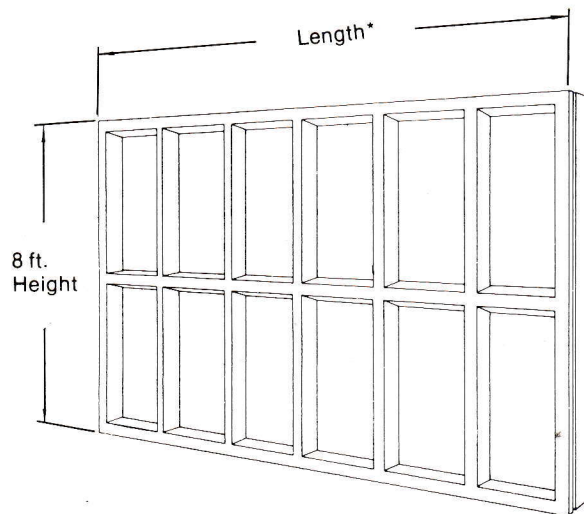
STANDARD WALL PANEL



PLAN VIEW

VERTICAL PANEL DETAIL

8 FT. HIGH WALL PANELS

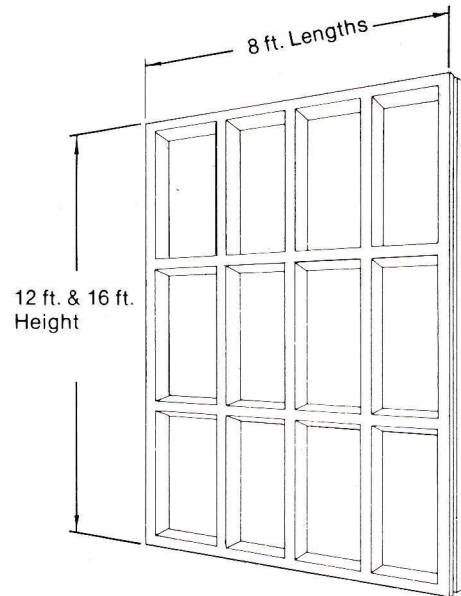


* Standard Wall Panel Dimensions

- * 8 Ft. High x 7'-11 3/4" Long
- 8 Ft. High x 9'-11 3/4" Long
- 8 Ft. High x 11'-11 3/4" Long
- 8 Ft. High x 13'-11 3/4" Long
- 8 Ft. High x 15'-11 3/4" Long

NOTE:
OTHER PANEL LENGTHS
AVAILABLE DEPENDING
UPON APPLICATION

12 FT. & 16 FT. HIGH WALL PANELS

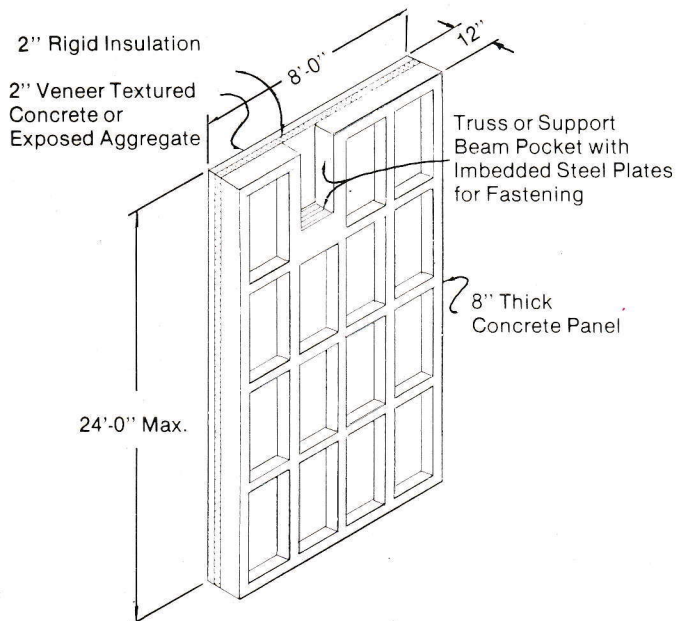


Standard Wall Panel Dimensions

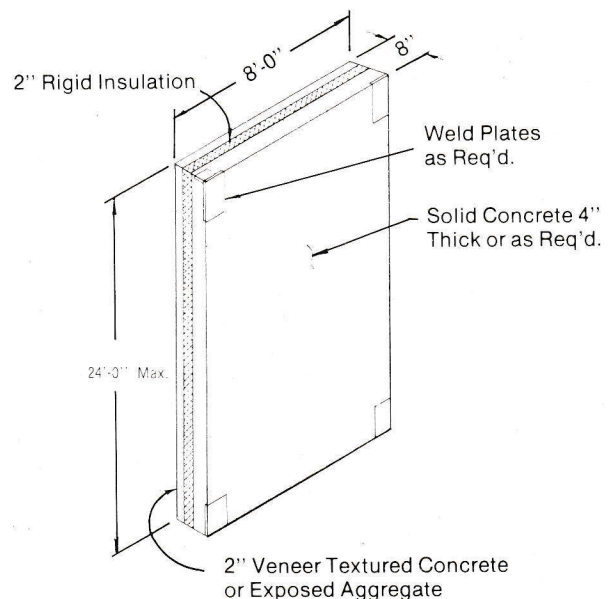
- 12 Ft. High x 7'-11 3/4" Long
- 16 Ft. High x 7'-11 3/4" Long

NOTE:
OTHER PANEL LENGTHS
AVAILABLE DEPENDING
UPON APPLICATION

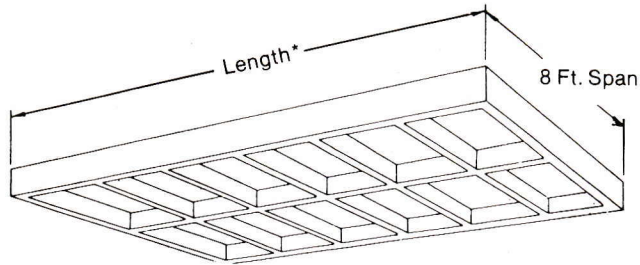
CONCRETE SANDWICH STANDARD WALL PANEL



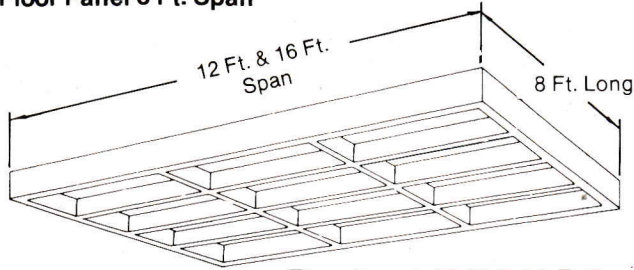
CONCRETE SANDWICH WALL PANEL



FLOOR PANEL DIMENSIONS



Floor Panel 8 Ft. Span



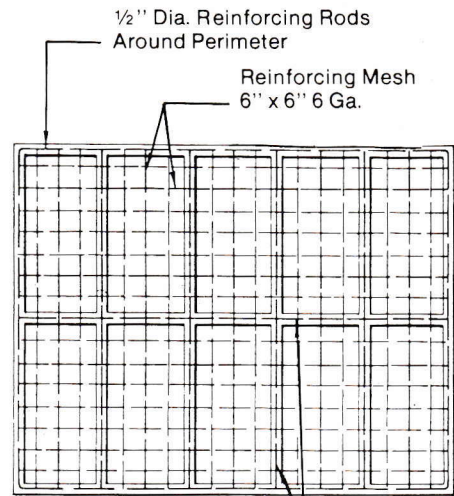
Floor Panel 12 Ft & 16 Ft Span

*Standard Wall Panel Dimensions

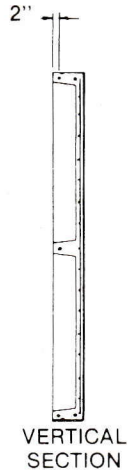
- *8 Ft. Span x 7'-11 3/4" Long
- 8 Ft. Span x 9'-11 3/4" Long
- 8 Ft. Span x 11'-11 3/4" Long
- 8 Ft. Span x 13'-11 3/4" Long
- 8 Ft. Span x 15'-11 3/4" Long
- 12 Ft. Span x 7'-11 3/4" Long
- 16 Ft. Span x 7'-11 3/4" Long

NOTE:
OTHER PANEL LENGTHS
AVAILABLE DEPENDING
UPON APPLICATION

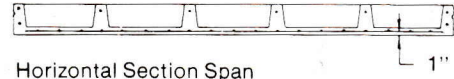
REINFORCING DETAILS



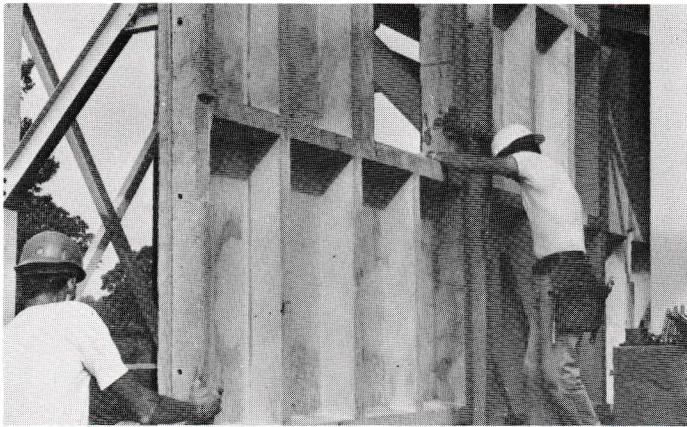
ELEVATION



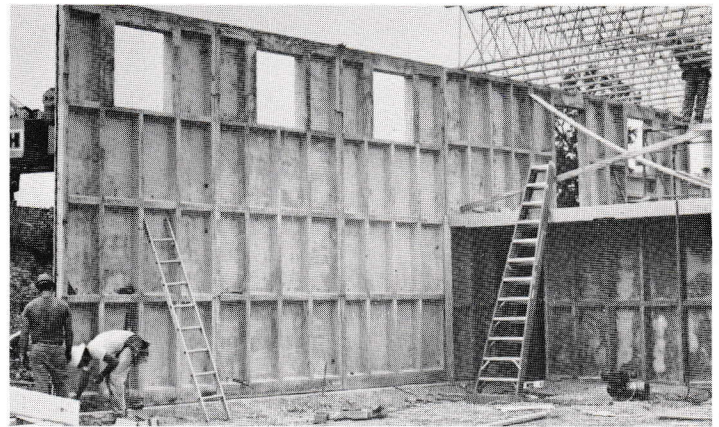
VERTICAL SECTION



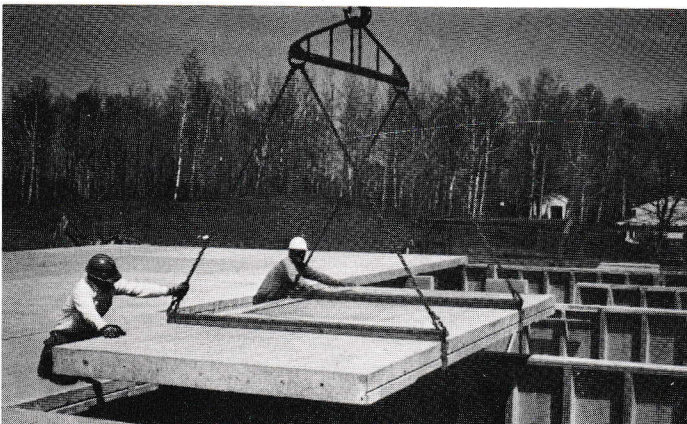
Horizontal Section Span



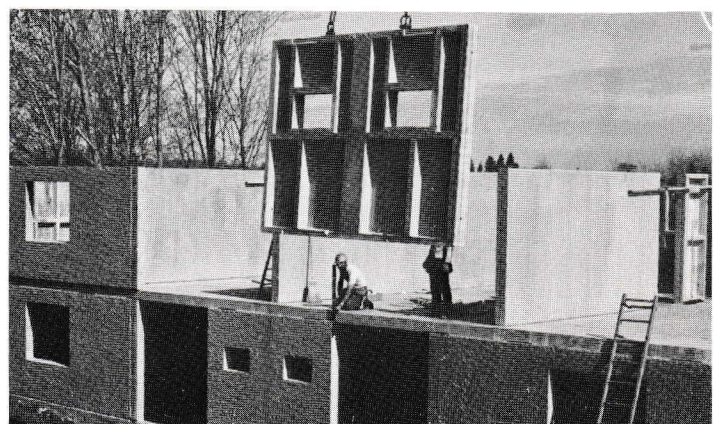
PANEL PLACEMENT



WALL CONSTRUCTION

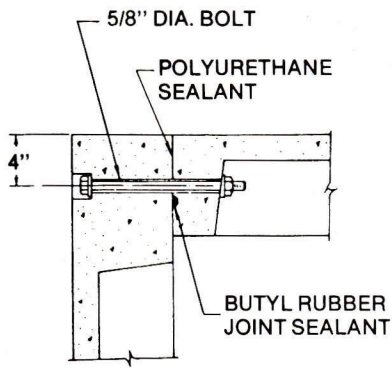


PLACING FLOOR

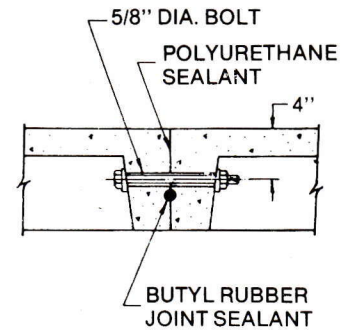


ROUGH WALL OPENINGS

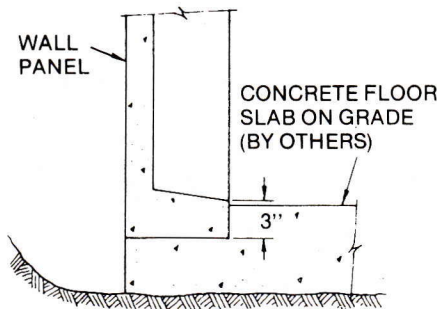
ERECTION DETAILS



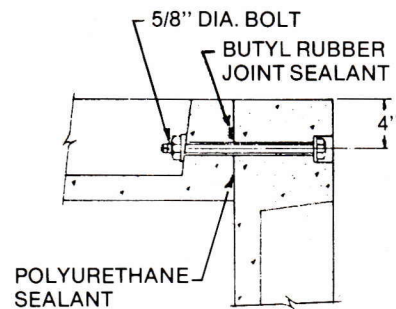
PLAN VIEW OF OUTSIDE CORNER



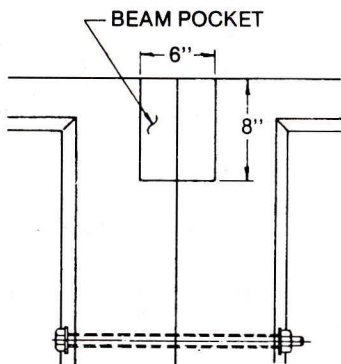
SIDE WALL CONNECTION



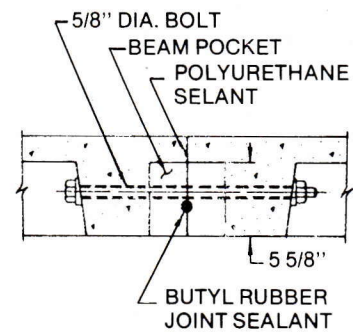
WALL PANEL & FLOOR



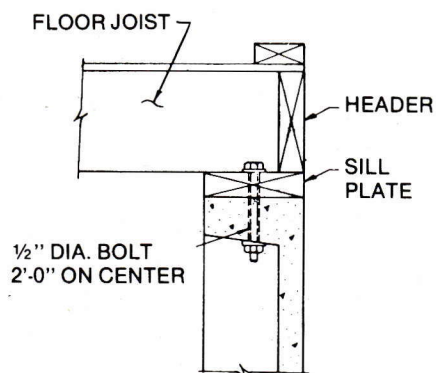
PLAN VIEW OF INSIDE CORNER



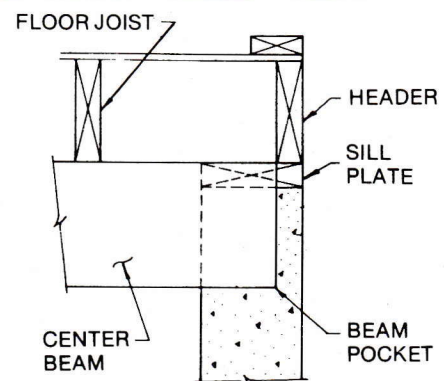
BEAM POCKET INSIDE VIEW



PLAN VIEW SECTION THRU BEAM POCKET

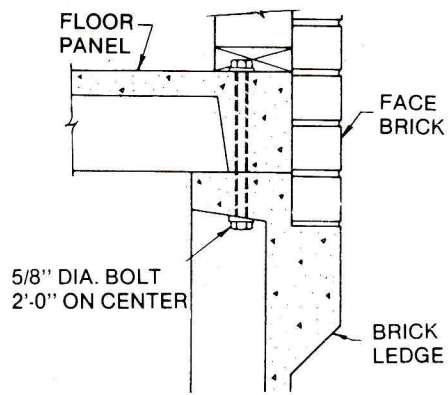


FLOOR JOIST TO WALL PANEL

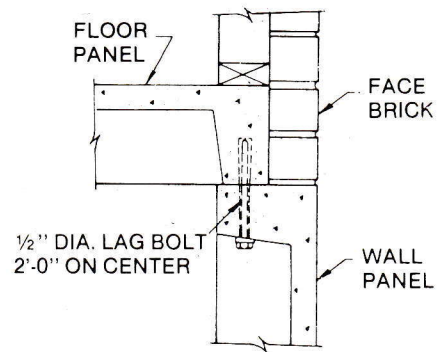


FLOOR JOIST BEAM CONNECTION

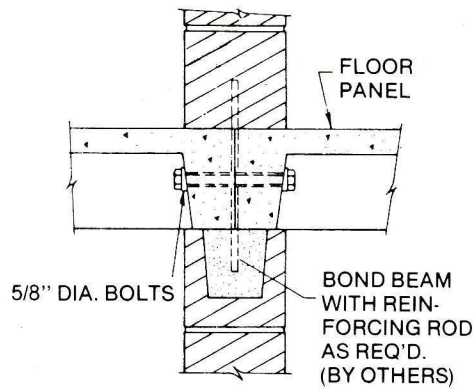
ERECTION DETAILS



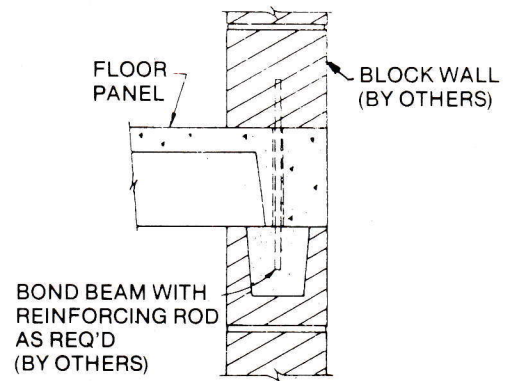
PRECAST BRICK LEDGE ON BASEMENT WALL PANEL



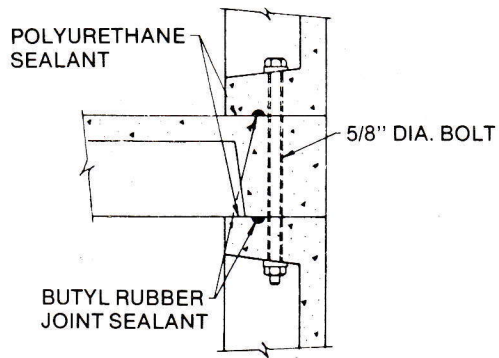
BRICK LEDGE ON TOP OF BASEMENT, WALL PANEL



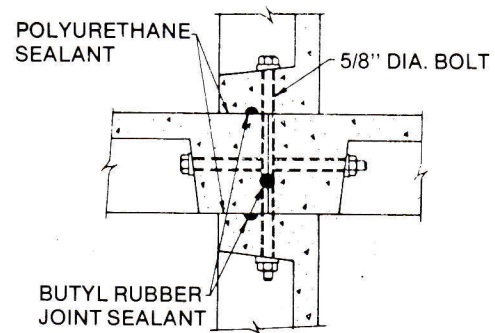
FLOOR PANELS WITH INTERIOR CONCRETE BLOCK WALL



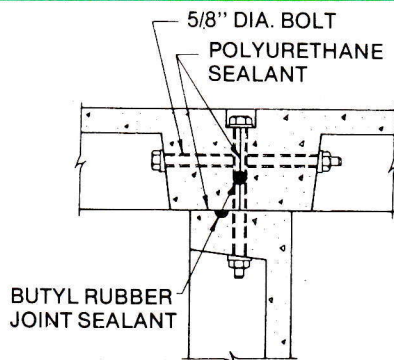
FLOOR PANELS WITH EXTERIOR CONCRETE BLOCK WALL



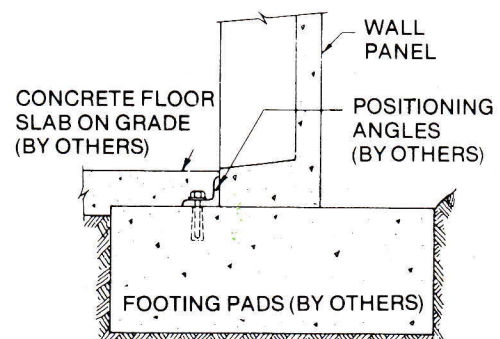
SECTION AT EXTERIOR CONNECTION



SECTION AT INTERIOR CONNECTION

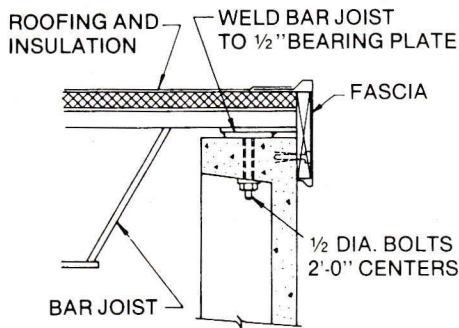


INTERIOR WALL TO EXTERIOR WALL

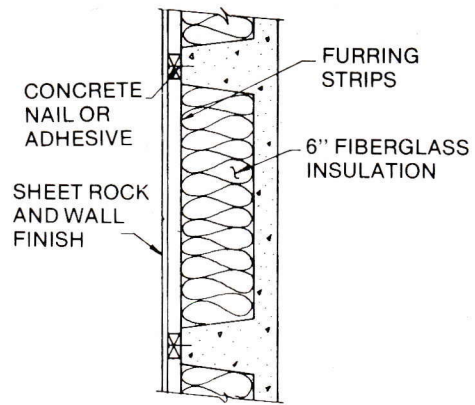


WALL PANEL ON BELOW GRADE FOOTING

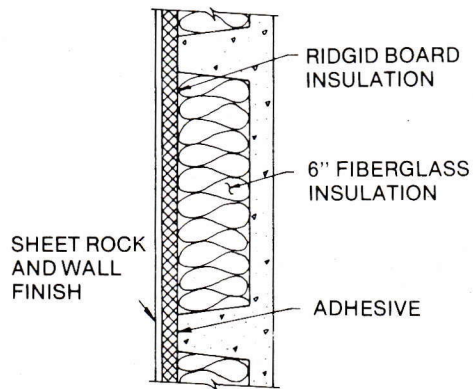
ERECTION DETAILS



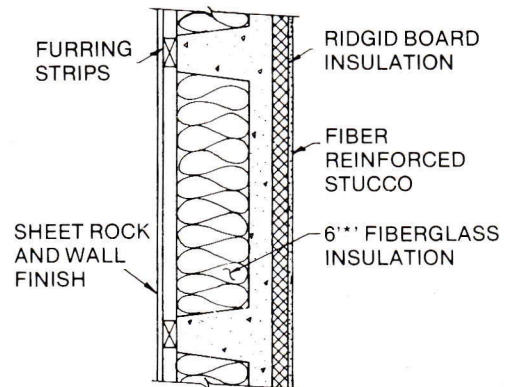
BAR JOIST TO WALL PANEL



WALL INSULATION DETAIL "A"



WALL INSULATION DETAIL "B"



WALL INSULATION DETAIL "C"

ALLOWABLE COMBINED HORIZONTAL AND AXIAL LOADS ON WALL PANELS NORMAL AND LIGHTWEIGHT CONCRETE¹

HORIZONTAL LOAD (psf.)	$f_c^1 = 3000 \text{ psi}$			$f_c^1 = 4000 \text{ psi}$			$f_c^1 = 5000 \text{ psi}$			
	WALL PANEL HEIGHT (Feet)									
	8 ²	12 ³	16 ⁴	8 ²	12 ³	16 ⁴	8 ²	12 ³	16 ⁴	20 ⁵
	Axial Load (Lbs/lin.ft.)			Axial Load (Lbs/lin.ft.)			Axial Load (Lbs/lin.ft.)			
20	7430	6200	4590	9970	8390	6290	12,510	10,580	7990	5250
30	7330	6010	4330	9870	8200	6030	12,410	10,390	7730	5010
40	7230	5820	4070	9770	8010	5780	12,310	10,210	7480	4760
50	7140	5640	3810	9680	7830	5520	12,220	10,020	7220	4480

¹Based on formula

$$P = 0.2(0.4f_c^1 - c) A_g [1 - (l/40h)^2]$$

Where

P = allowable axial load in pounds per linear foot of wall
 f_c^1 = 28-day compressive strength of concrete (psi)
 c = unit stress due to horizontal load (psi)
 A_g = gross area of concrete per foot of wall panel (square inches) maximum height is limited to 20 feet
 l = unsupported height of wall (inches)
 h = overall depth of panel (inches)

²Minimum web reinforcing one No. 4 bar

³Minimum web reinforcing one No. 5 bar

⁴Minimum web reinforcing one No. 6 bar

⁵Minimum web reinforcing one No. 8 bar

NOTE: All transverse members have one No. 4 bar

TABLE NO. 1
ALLOWABLE SUPERIMPOSED UNIFORM LOAD AND DEFLECTION FOR FLOOR PANELS¹

(Lb./sq./ft.) and (In.)

$f'_c = 3000 \text{ psi}$ $f_s = 24,000 \text{ psi}$ Normal Weight Concrete = 150lb./cu. ft.

SPAN (Feet)	REINFORCING STEEL (One bar per joist)											
	No. 4		No. 5		No. 6		No. 7		No. 8		No. 9	
	Load	Defl.	Load	Defl.	Load	Defl.	Load	Defl.	Load	Defl.	Load	Defl.
8	90	.02	164	.03	181*	.03						
12			47	.04	84	.08	105*	.09				
16					26	.07	51	.15	67*	.19		
20							15	.10	34	.24	44*	.31
24											23	.33

¹All transverse members have one No. 4 bar.

*Controlled by shear.

TABLE NO. II
ALLOWABLE SUPERIMPOSED UNIFORM LOAD AND DEFLECTION FOR FLOOR PANELS¹

(Lb./sq./ft.) and (In.)

$f'_c = 4000 \text{ psi}$ $f_s = 24,000 \text{ psi}$ Normal Weight Concrete = 150 lb./cu. ft.

SPAN (Feet)	REINFORCING STEEL (One bar per joist)											
	No. 4		No. 5		No. 6		No. 7		No. 8		No. 9	
	Load	Defl.	Load	Defl.	Load	Defl.	Load	Defl.	Load	Defl.	Load	Defl.
8	90	.01	164	.03	219*	.03						
12			47	.04	84	.07	127	.10	130*	.10		
16					26	.06	51	.13	79	.20	86*	.21
20									34	.21	53	.32
24											23	.29

¹All transverse members have one No. 4 bar.

*Controlled by shear.

TABLE NO. III
ALLOWABLE SUPERIMPOSED UNIFORM LOAD AND DEFLECTION FOR FLOOR PANELS¹

(Lb./sq./ft.) and (In.)

$f'_c = 5000 \text{ psi}$ $f_s = 24,000 \text{ psi}$ Normal Weight Concrete = 150 lb./cu. ft.

SPAN (Feet)	REINFORCING STEEL (One bar per joist)											
	No. 4		No. 5		No. 6		No. 7		No. 8		No. 9	
	Load	Defl.	Load	Defl.	Load	Defl.	Load	Defl.	Load	Defl.	Load	Defl.
8	90	.01	164	.02	247	.03	249*	.03				
12			47	.03	84	.06	128	.09	151*	.11		
16					26	.06	51	.11	79	.17	101*	.22
20									34	.18	53	.29
24											23	.26

¹All transverse members have one No. 4 bar.

*Controlled by shear.

GENERAL NOTES:

1. Panel wt./sq.ft. equals approximately 45 lbs./sq.ft. for normal weight concrete and 35 lbs./sq.ft. for lightweight concrete.
2. When panels are used as wall panels, allowable superimposed horizontal load can be determined by adding dead load per square foot to loads shown.