Hollow Core

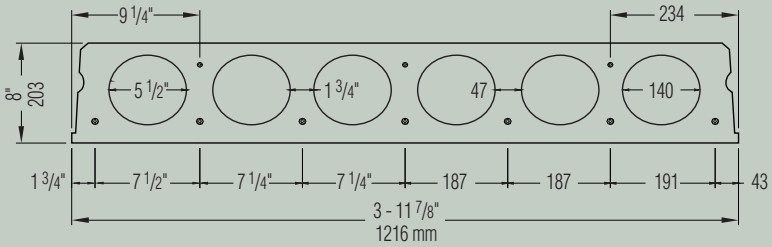
- 8”, 10”, 12”, 14” thicknessess
- 5,000 – 7,000 square feet installed in one day
- Provides an instant working deck for other trades
- Storage in yard waiting for transport

Hollow Core

- Spans 50 feet plus
- Continuous installation minimizing down time on site for other trades
- Proper co-ordination and quick installation allows for a fast-paced construction site

Hollow Core– 8" (203 mm) Load Tables

Hollow Core Slab Properties		
Prop	Imperial	Metric
A	233.65 in^2	150742 mm^2
I_x	1727 in^4	7.18x10^8 mm^4
Y_b	3.98 in	101 mm
b_w	13 in	330.2 mm
f_{pu}	270 ksi	1860 Mpa
f'_c	7000 psi	41 Mpa
$f'_{c\ min}$	3000 psi	20.7 Mpa
S_w	62 psf	2.97 kPa



METRIC

203 mm Hollow Core Metric Load Table - Total Uniformly Distributed Load - kPa (kN/m^2)

1/2" Strands	M_r (kNm)	Simple Span - Centre to Centre of Span - Meters																								
		3*	3.5*	4*	4.5	5	5.5	5.75	6	6.25	6.5	6.75	7	7.25	7.5	7.75	8	8.25	8.5	8.75	9	9.25	9.5	9.75	10
7	146.3	58.0	43.7	36.0	29.2	23.2	18.7	16.9	15.3	13.9	12.7	11.6	10.6	9.7	8.9	8.2	7.5	6.9	6.4	5.9	5.4	5.0	4.6	4.2	3.9
6	131.9	50.9	37.5	31.5	26.1	20.6	16.6	15.0	13.6	12.3	11.2	10.2	9.3	8.5	7.8	7.1	6.5	6.0	5.5	5.0	4.6	4.2	3.9	3.6	3.3
5	114.3	61.4	31.8	26.8	22.2	17.5	14.1	12.6	11.4	10.3	9.3	8.5	7.7	7.0	6.4	5.8	5.3	4.8	4.4	4.0	3.7	3.3	3.0	2.8	2.5
4	94.3	33.5	25.7	21.6	17.9	14.0	11.2	10.0	9.0	8.1	7.3	6.6	5.9	5.4	4.8	4.4	3.9	3.6	3.2	2.9	2.6	2.3	2.1		
3	72.7	24.2	19.3	16.0	13.2	10.2	8.0	7.1	6.3	5.6	5.0	4.5	4.0	3.5	3.2	2.8	2.5	2.2							

IMPERIAL

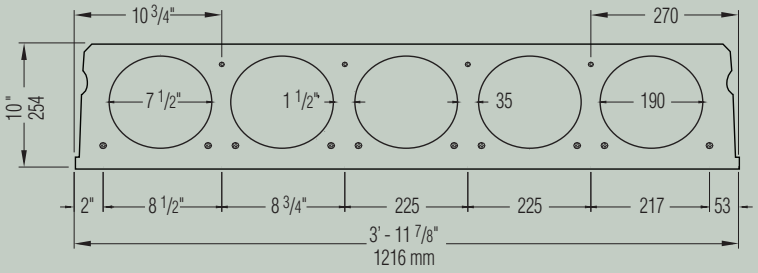
8" Hollow Core Imperial Load Table - Total Uniformly Distributed Load - psf (lb/ft^2)

1/2" Strands	M_r (kip ft)	Simple Span - Centre to Centre of Span - Feet																								
		10*	11*	12*	13*	14*	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
7	107.7	1167	993	845	763	653	586	508	444	391	345	307	273	244	219	197	177	160	144	131	118	107	97	88	79	
6	97.2	1025	855	740	668	575	523	454	396	347	306	271	241	215	192	172	155	139	125	113	102	91	82	74	66	
5	84.3	1238	727	630	570	488	447	387	337	295	259	229	202	180	160	143	127	114	102	91	81	72	65	57	51	
4	69.6	676	588	505	460	393	360	310	269	234	205	180	158	139	123	109	96	85	75	66	58	51	44			
3	53.7	488	443	380	340	293	266	227	195	168	146	126	110	95	83	72	62	53	46							

* Capacity limited by development length of reinforcing strands.

Hollow Core– 10" (254 mm) Load Tables

Hollow Core Slab Properties		
Prop	Imperial	Metric
A	253.81 in^2	163748 mm^2
I_x	3148 in^4	1.31x10^9 mm^4
Y_b	4.96 in	151.1 mm
b_w	9.31 in	236.4 mm
f_{pu}	270 ksi	1860 Mpa
f'_c	7000 psi	41 Mpa
$f'_{c\ min}$	3000 psi	20.7 Mpa
S_w	70 psf	3.35 kPa



METRIC

254 mm Hollow Core Metric Load Table - Total Uniformly Distributed Load - kPa (kN/m^2)

1/2" Strands	M_r (kNm)	Simple Span - Centre to Centre of Span - Meters																						
		6	6.5	7	7.5	8	8.5	8.75	9	9.25	9.5	9.75	10	10.25	10.5	10.75	11	11.25	11.5	11.75	12	12.25	12.5	12.75	13
10	250.1	27.5	23.0	19.4	16.6	14.2	12.2*	11.4*	10.6*	9.9*	9.2*	8.6*	8.0*	7.5*	7.0*	6.5*	6.1*	5.7*	5.3	5.0	4.7	4.4	4.1	3.8	3.5
8	226.3	24.6	20.5	17.3	14.7	12.6	10.8	10.0	9.3	8.7	8.0	7.5	7.0	6.5	6.1	5.6	5.3	4.9	4.6	4.2	3.9	3.7	3.4	3.2	2.9
6	182.9	19.3	16.0	13.4	11.3	9.6	8.2	7.5	7.0	6.4	5.9	5.5	5.1	4.7	4.3	4.0	3.7	3.4	3.1	2.9	2.6	2.4	2.2	2.0	
4	127.9	12.6	10.3	8.5	7.0	5.8	4.8	4.4	4.0	3.6	3.3	3.0	2.7	2.4	2.1										

IMPERIAL

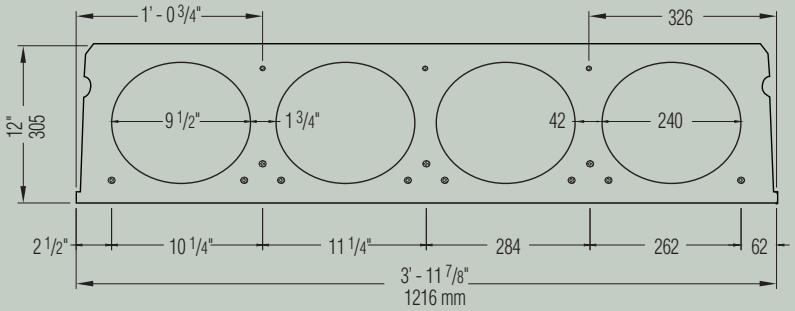
10” Hollow Core Imperial Load Table - Total Uniformly Distributed Load - psf (lb/ft^2)

1/2" Strands	M_r (kip ft)	Simple Span - Centre to Centre of Span - Feet																							
		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
10	185	554	497	447	404	366	333	303	276	252*	231*	212*	194*	178*	164*	151*	139*	128*	118*	109	100	92	85	78	72
8	167	495	443	398	359	325	295	268	244	222	203	186	170	156	143	131	120	110	101	93	85	78	71	65	59
6	135	389	347	311	279	251	227	205	185	168	153	138	126	114	104	94	85	77	70	63	57	51	45	40	
4	95	254	224	199	177	157	140	125	111	99	88	78	70	61	54	47	41								

* Consult Stubbe's Precast to ensure LL deflections do not exceed l/360 for Live Loads greater than 100psf (4.8kPa)

Hollow Core – 12" (305 mm) Load Tables

Hollow Core Slab Properties		
Prop	Imperial	Metric
A	296.36 in^2	191199 mm^2
I_x	5300 in^4	2.21x10^9 mm^4
Y_b	5.95 in	151.1mm
bw	9 in	228.6 mm
f_{pu}	270 ksi	1860 Mpa
f'_c	7000 psi	41 Mpa
$f'_{c\ min}$	3000 psi	20.7 Mpa
S_w	82 psf	3.93 kPa



METRIC

305 mm Hollow Core Metric Load Table - Total Uniformly Distributed Load - kPa (kN/m^2)

1/2" Strands	M_r (kNm)	Simple Span - Centre to Centre of Span - Meters																							
		8	8.5	9	9.5	10	10.5	11	11.25	11.5	11.75	12	12.25	12.5	12.75	13	13.25	13.5	13.75	14	14.25	14.5	14.75	15	15.25
11	337.2	19.7	17.0	14.8	13.0	11.4	10.0	8.8	8.3	7.7	7.3	6.8	6.4	6.0	5.7	5.3	5.0	4.7	4.4	4.1	3.8	3.6	3.4	3.1	2.9
10	332.1	19.3	16.7	14.5	12.7	11.1	9.8	8.6	8.1	7.6	7.1	6.7	6.3	5.9	5.5	5.2	4.9	4.6	4.3	4.0	3.7	3.5	3.3	3.0	2.8
9	316.5	18.3	15.8	13.7	11.9	10.4	9.2	8.0	7.5	7.1	6.6	6.2	5.8	5.5	5.1	4.8	4.5	4.2	3.9	3.6	3.4	3.2	2.9	2.7	2.5
8	296.2	16.9	14.5	12.6	11.0	9.6	8.4	7.3	6.8	6.4	6.0	5.6	5.2	4.9	4.6	4.3	4.0	3.7	3.4	3.2	3.0	2.7	2.5	2.3	2.2
7	266.5	14.8	12.7	11.0	9.5	8.3	7.2	6.2	5.8	5.4	5.0	4.7	4.4	4.0	3.8	3.5	3.2	3.0	2.7	2.5	2.3	2.1			
6	233.7	12.6	10.8	9.2	7.9	6.8	5.9	5.0	4.7	4.3	4.0	3.7	3.4	3.1	2.9	2.6	2.4	2.2	2.0						
5	198.6	10.2	8.6	7.3	6.2	5.3	4.5	3.8	3.4	3.2	2.9	2.6	2.4	2.1											

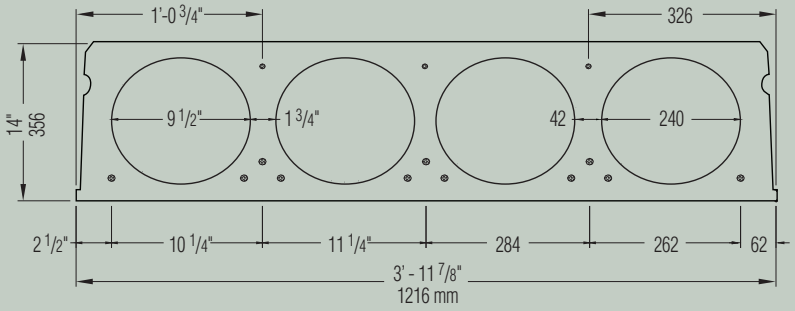
IMPERIAL

12" Hollow Core Imperial Load Table - Total Uniformly Distributed Load - psf (lb/ft^2)

1/2" Strands	M_r (kip ft)	Simple Span - Centre to Centre of Span - Feet																							
		27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
11	252.3	390	357	328	302	278	257	237	219	203	188	174	161	150	139	128	119	110	102	94	87	81	74	68	63
10	245.1	377	345	317	291	268	247	228	211	195	180	167	155	143	133	123	114	105	97	90	83	76	70	64	59
9	233.9	356	326	299	275	253	233	215	198	183	169	156	144	133	123	114	105	97	89	82	76	70	64	58	53
8	218.8	329	300	275	252	232	213	196	181	166	153	141	130	120	111	102	94	86	79	72	66	60	55	50	45
7	197	289	263	241	220	202	185	170	156	143	131	120	110	101	93	85	77	70	64	58	52	47	42		
6	172.8	244	222	202	184	168	153	140	128	116	106	97	88	80	72	65	59	53	47	42					
5	146.8	197	178	161	146	132	119	108	98	88	79	71	64	57	51	45									

Hollow Core– 14" (356 mm) Load Tables

Hollow Core Slab Properties		
Prop	Imperial	Metric
A	367.36 in^2	237006 mm^2
I_x	8728 in^4	3.63 x 10^9 mm^4
Y_b	6.85 in	174 mm
b_w	12.375 in	314.3 mm
f_{pu}	270 ksi	1860 Mpa
f'_c	7000 psi	41 Mpa
$f'_{c\ min}$	3000 psi	20.7 Mpa
S_w	101 psf	4.84 kPa



METRIC

356 mm Hollow Core Metric Load Table - Total Uniformly Distributed Load - kPa (kN/m^2)

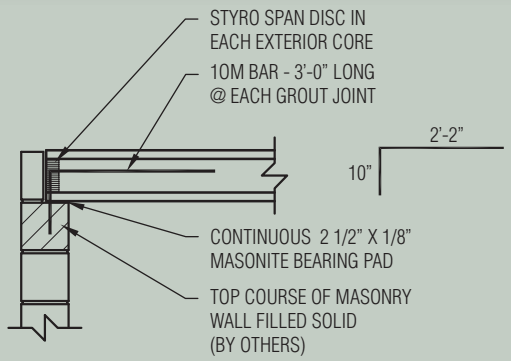
1/2" Strands	M_r (kNm)	Simple Span - Centre to Centre of Span - Meters																							
		9	9.5	10	10.5	11	11.5	12	12.25	12.5	12.75	13	13.25	13.5	13.75	14	14.25	14.5	14.75	15	15.25	15.5	15.75	16	16.25
11	464.3	20.7	18.1	15.9	14.0	12.4	11.0	9.7	9.1	8.6	8.1	7.6	7.2	6.7	6.3	6.0	5.6	5.3	4.9	4.6	4.3	4.1	3.8	3.5	3.3
10	434.6	19.1	16.7	14.6	12.9	11.3	10.0	8.8	8.3	7.8	7.3	6.9	6.4	6.0	5.7	5.3	5.0	4.6	4.3	4.0	3.8	3.5	3.3	3.0	2.8
9	402.2	17.4	15.1	13.2	11.6	10.2	8.9	7.8	7.3	6.9	6.4	6.0	5.6	5.3	4.9	4.6	4.3	4.0	3.7	3.4	3.2	2.9	2.7	2.5	2.3
8	367.6	15.5	13.4	11.7	10.2	8.9	7.8	6.8	6.3	5.9	5.5	5.1	4.8	4.4	4.1	3.8	3.5	3.2	3.0	2.7	2.5	2.3	2.1		
7	326.3	13.2	11.4	9.9	8.6	7.4	6.4	5.5	5.1	4.7	4.4	4.0	3.7	3.4	3.1	2.9	2.6	2.4	2.2						
6	283.6	10.9	9.4	8.0	6.9	5.9	5.0	4.2	3.9	3.5	3.2	2.9	2.7	2.4	2.2										
5	239.0	8.5	7.2	6.1	5.1	4.2	3.5	2.9	2.6	2.3	2.0														

IMPERIAL

14” Hollow Core Imperial Load Table - Total Uniformly Distributed Load - psf (lb/ft^2)

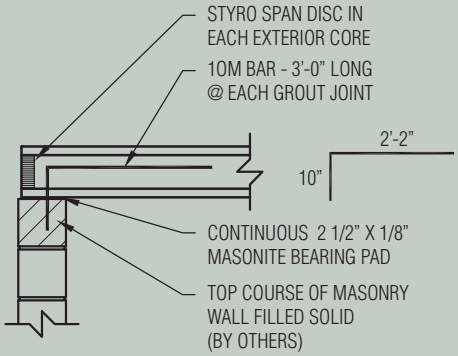
1/2" Strands	M_r (kip ft)	Simple Span - Centre to Centre of Span - Feet																							
		30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
11	342.4	415	383	353	327	302	280	260	241	224	208	193	179	166	154	143	133	123	114	106	98	90	83	76	70
10	320.5	382	352	325	300	277	256	237	220	203	188	175	162	150	139	128	119	109	101	93	85	78	72	66	60
9	296.6	347	319	294	271	250	230	213	196	181	168	155	143	132	121	112	103	94	87	79	72	66	60	54	48
8	271.1	309	284	260	239	220	203	186	172	158	145	133	123	112	103	94	86	78	71	64	58	52	46	41	
7	240.7	264	241	221	202	185	169	155	142	130	119	108	98	89	81	73	66	59	53	47	41				
6	209.2	217	198	180	164	149	135	123	111	101	91	82	73	66	58	52	45								
5	176.3	169	152	137	123	111	99	89	79	70	62	54	47	41											

Hollow Core – Connections to Masonry Walls

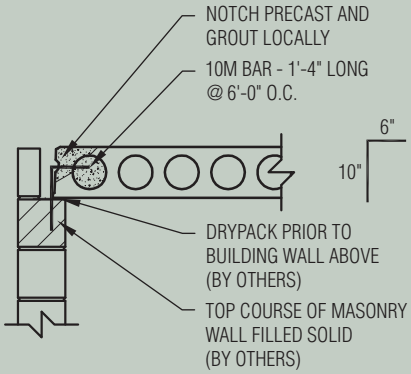


NOTE: MIN 3 1/2" END BEARING

MW1 End Bearing – Half

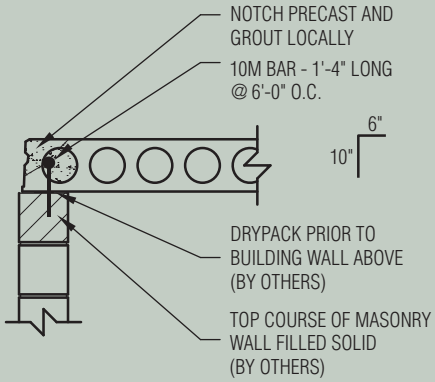


MW2 End Bearing – Full



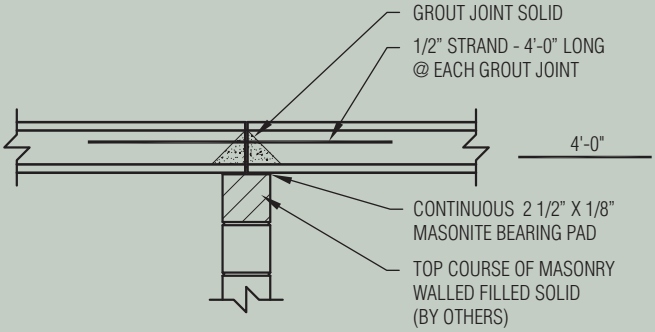
NOTE: SIDE BEARING NOT REQUIRED BUT MAY BE USED TO PROVIDE LATERAL SUPPORT TO WALLS

MW3 Side Bearing – Half



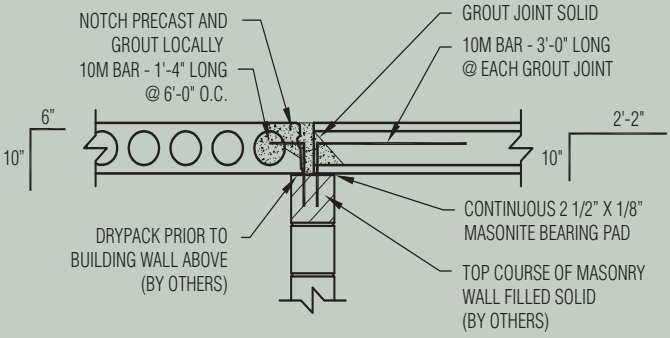
NOTE: SIDE BEARING NOT REQUIRED BUT MAY BE USED TO PROVIDE LATERAL SUPPORT TO WALLS

MW4 Side Bearing – Full



NOTE: MIN 3 1/2" END BEARING

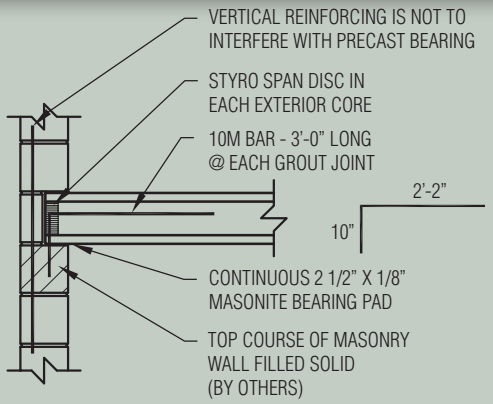
MW5 End to End Bearing



NOTE: MIN 3 1/2" END BEARING

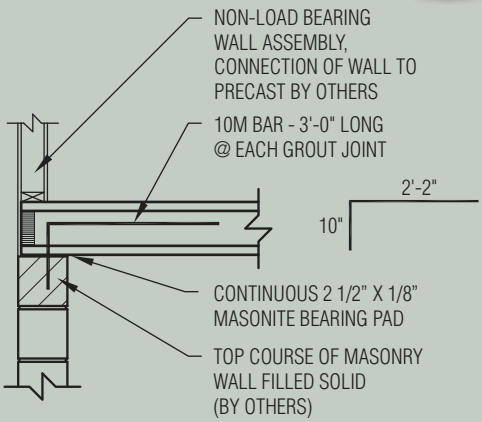
MW6 End to Side Bearing

Hollow Core – Connections to Masonry Walls

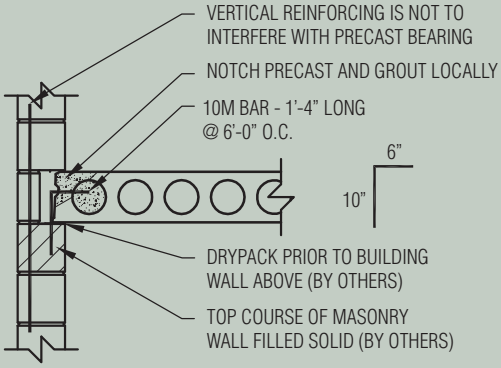


NOTE: MIN 3 1/2" [89] END BEARING

MW7 End Bearing – Half

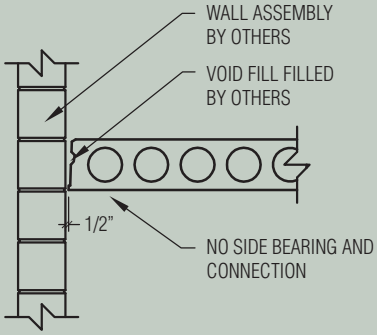


MW8 End Bearing – Full

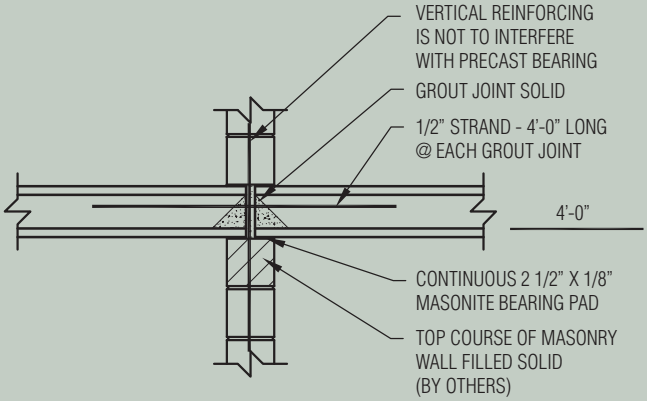


NOTE: SIDE BEARING NOT REQUIRED BUT MAY BE USED TO PROVIDE LATERAL SUPPORT TO WALLS

MW9 Side Bearing – Half

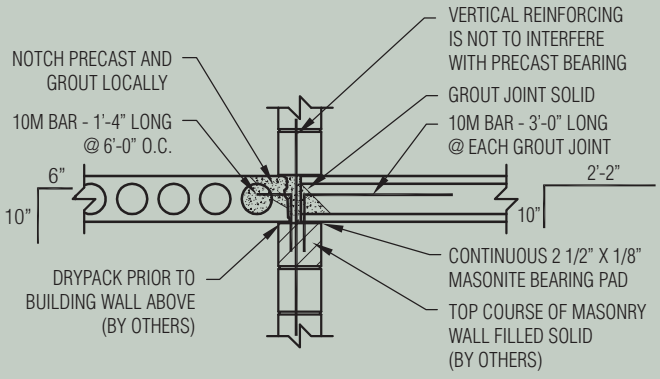


MW10 No Side Bearing



NOTE: MIN 3 1/2" END BEARING

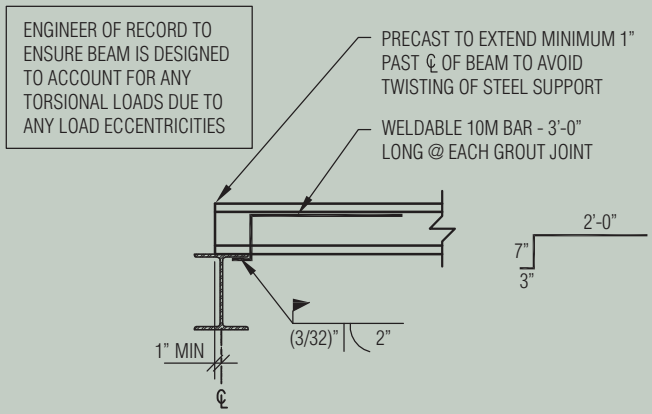
MW11 End to End Bearing



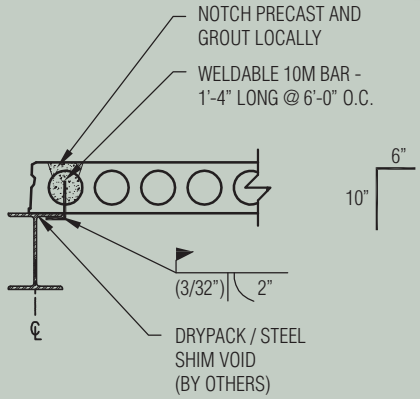
NOTE: MIN 3 1/2" END BEARING

MW12 End to Side Bearing

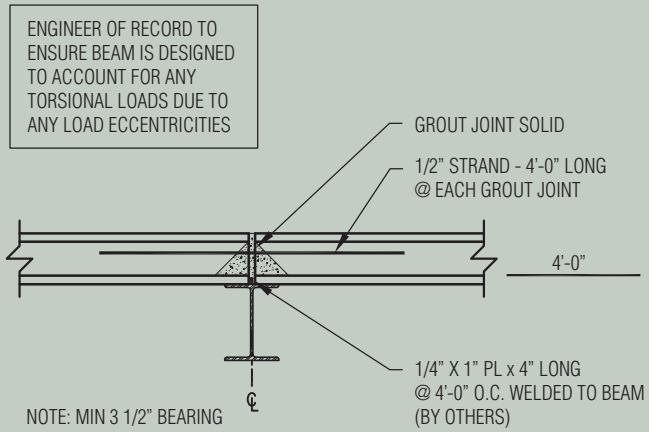
Hollow Core – Connections to Structural Steel



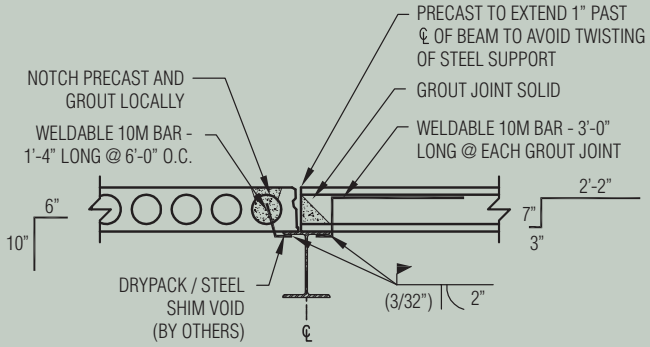
ST1 End Bearing



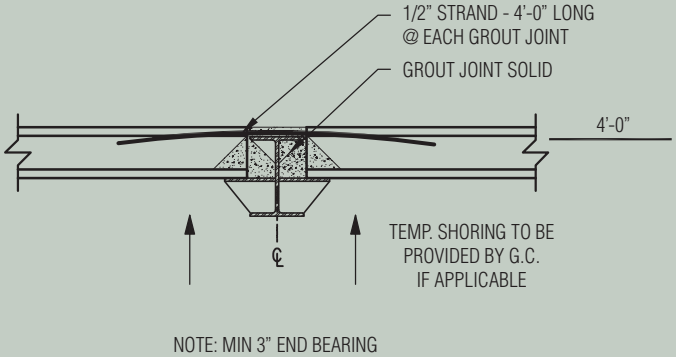
ST2 Side Bearing



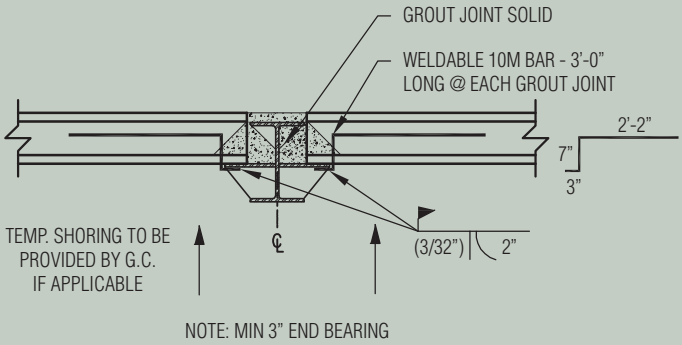
ST3 End to End Bearing



ST4 End to Side Bearing

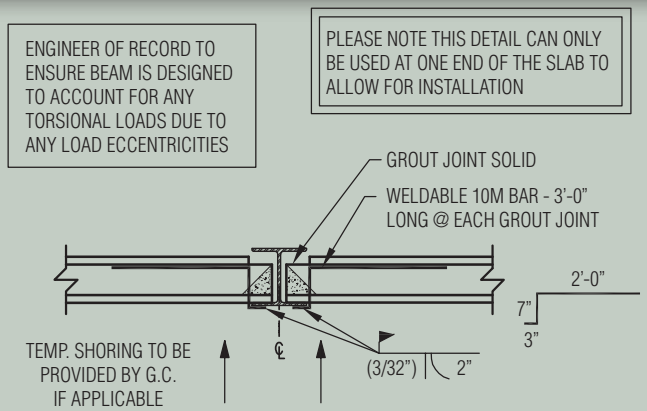


ST5 End to End Bearing – Recessed Beam



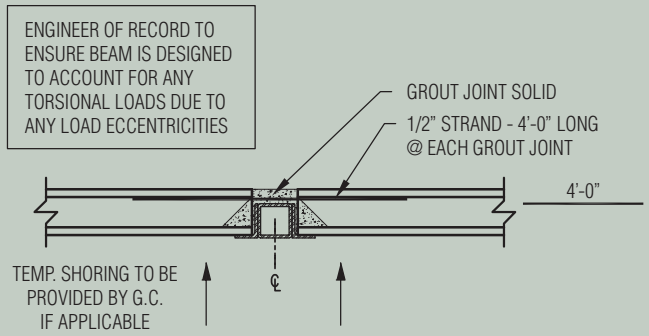
ST6 End to End Bearing –Recessed Beam

Hollow Core– Connections to Structural Steel



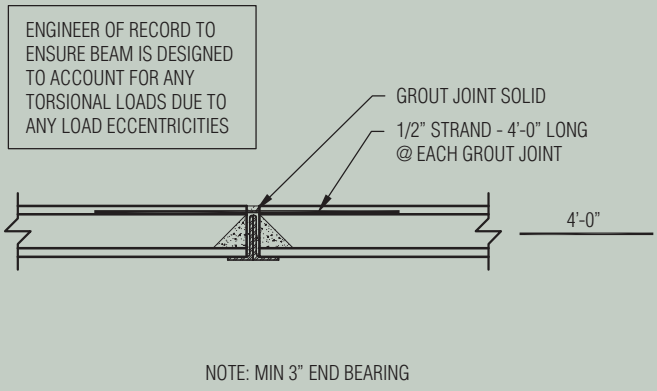
NOTE: MIN 3" END BEARING

ST7 End to End Bearing –Inside Beam



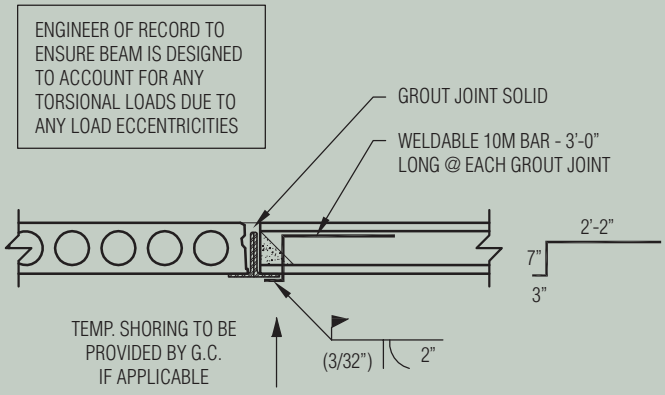
NOTE: MIN 3" END BEARING

ST8 End to End Bearing – HSS w/ Angles



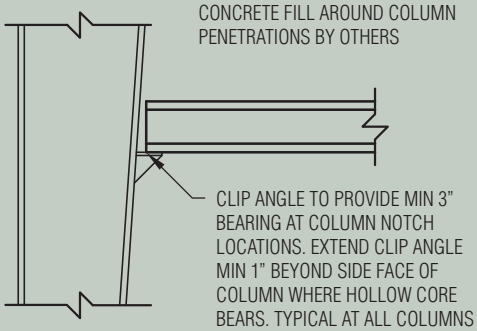
NOTE: MIN 3" END BEARING

ST9 End to End Bearing – Back to Back Angles



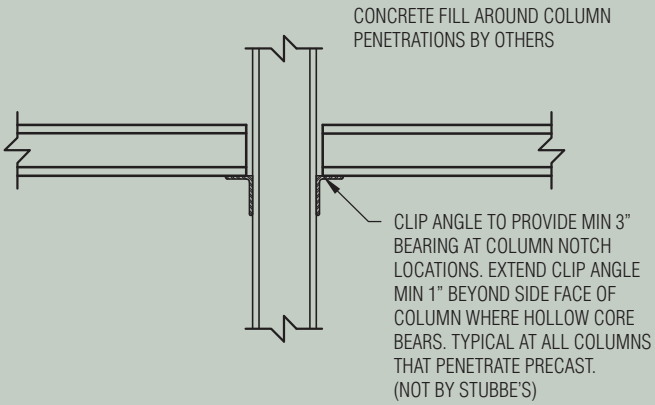
NOTE: MIN 3" END BEARING

ST10 End to Side Bearing – Back to Back Angles



NOTE: MIN 3" END BEARING

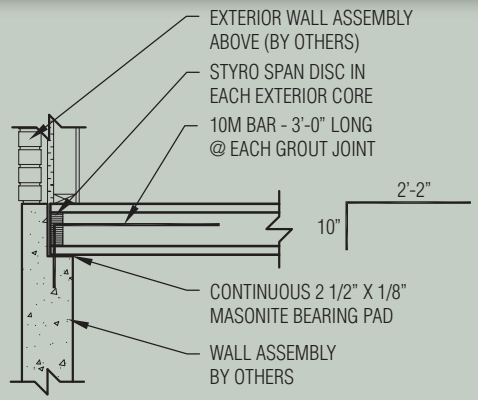
ST11 Clip Angle at Tapered Column Penetration



NOTE: MIN 3" END BEARING

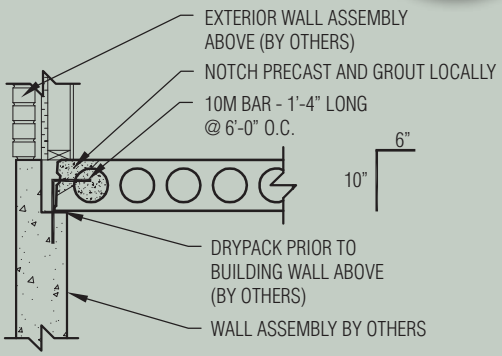
ST12 Clip Angles at Column Penetration

Hollow Core – Connections to Poured Concrete



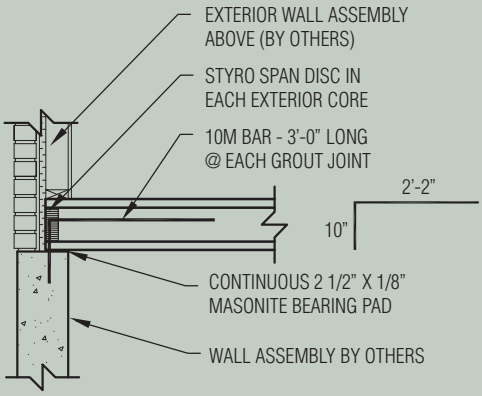
NOTE: 4" LEDGE w/MIN 3 1/2" END BEARING

PW1 End Bearing – Half On Step Wall



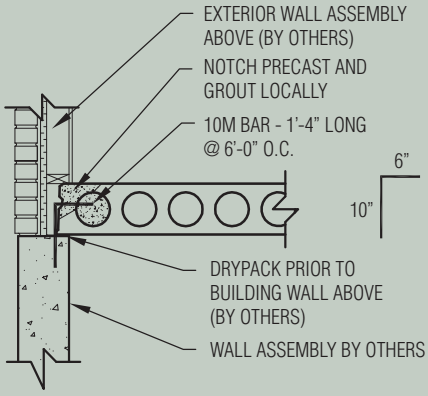
NOTE: SIDE BEARING NOT REQUIRED BUT MAY BE USED TO PROVIDE LATERAL SUPPORT TO WALLS

PW2 Side Bearing – Half On Step Wall



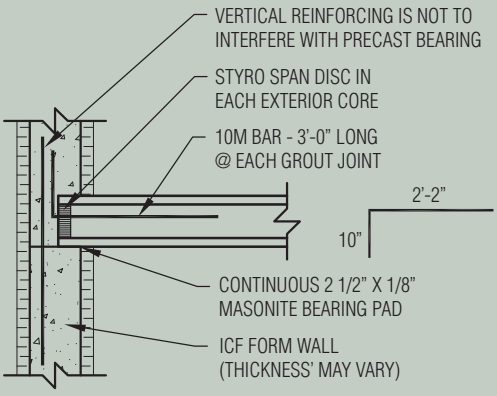
NOTE: MIN 3 1/2" END BEARING

PW3 End Bearing – Half



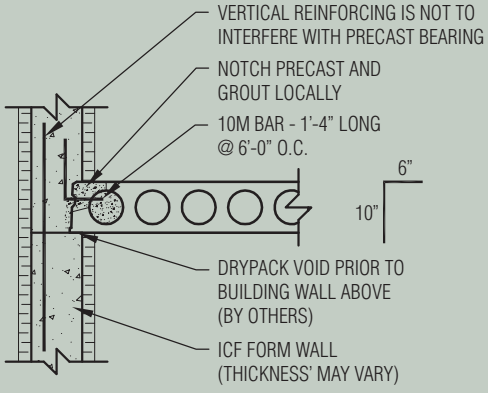
NOTE: SIDE BEARING NOT REQUIRED BUT MAY BE USED TO PROVIDE LATERAL SUPPORT TO WALLS

PW4 Side Bearing – Half



NOTE: MIN 3 1/2" END BEARING ON CONCRETE

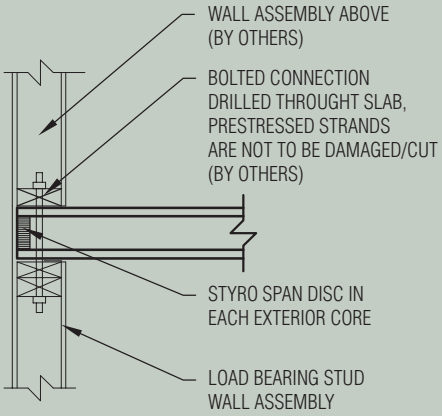
PW5 End Bearing – Half



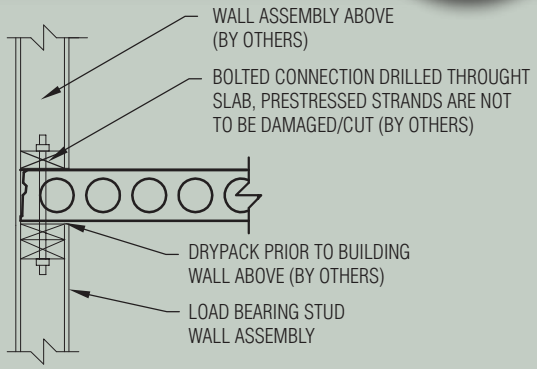
NOTE: SIDE BEARING NOT REQUIRED BUT MAY BE USED TO PROVIDE LATERAL SUPPORT TO WALLS

PW6 Side Bearing – Half

Hollow Core – Connections to Structural Wood & Metal Studs

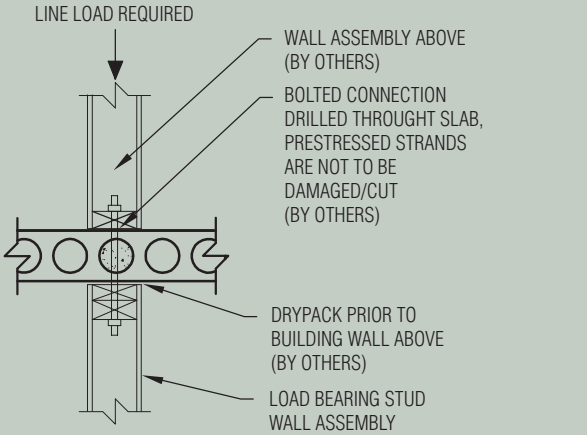


WD1 End Bearing – Full on Wood Studs

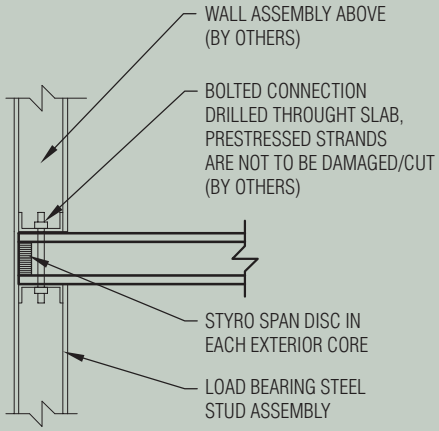


NOTE: SIDE BEARING NOT REQUIRED BUT MAY BE USED TO PROVIDE LATERAL SUPPORT TO WALLS

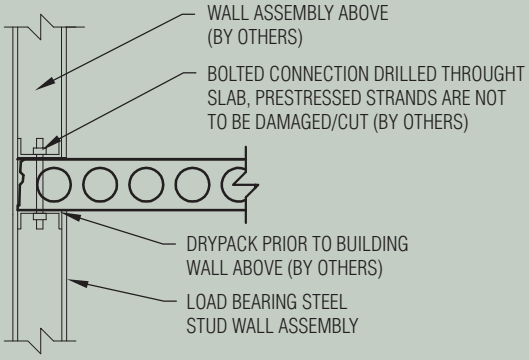
WD2 Side Bearing – Full on Wood Studs



WD3 Interior Wall Connection – Wood Studs

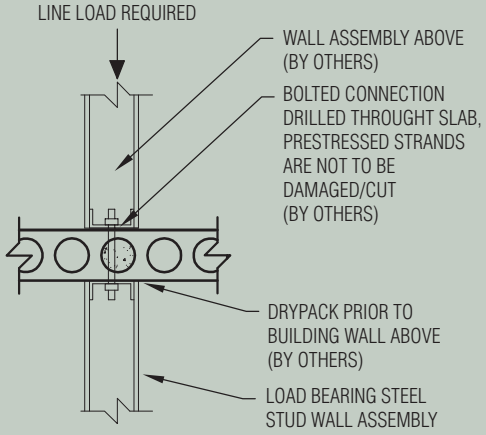


MTL1 End Bearing – Full on Steel Studs



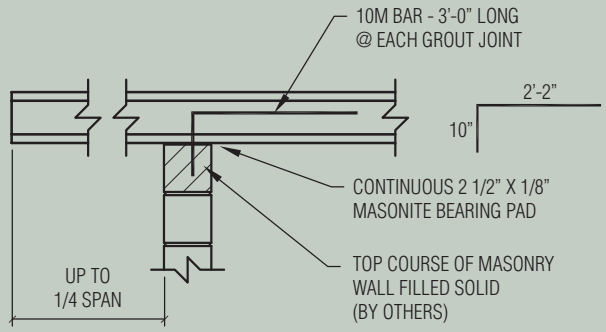
NOTE: SIDE BEARING NOT REQUIRED BUT MAY BE USED TO PROVIDE LATERAL SUPPORT TO WALLS

MTL2 Side Bearing – Full on Steel Studs

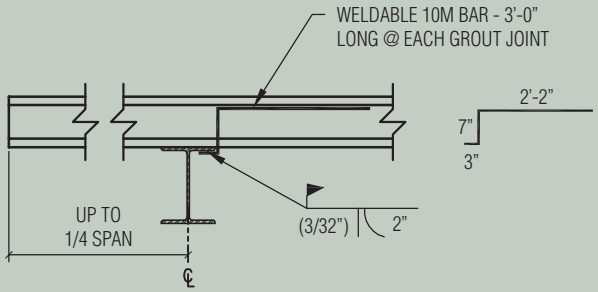


MTL3 Interior Wall Connection – Steel Studs

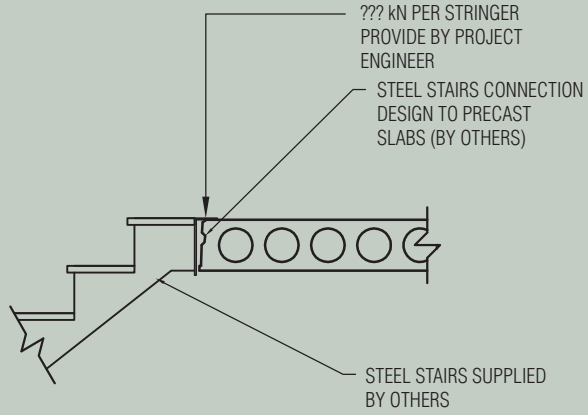
Hollow Core – Miscellaneous Connections Details



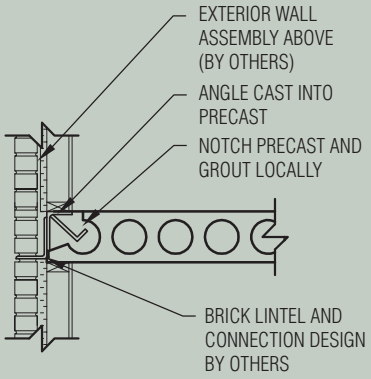
Misc 1 Cantilever Over Masonry Walls



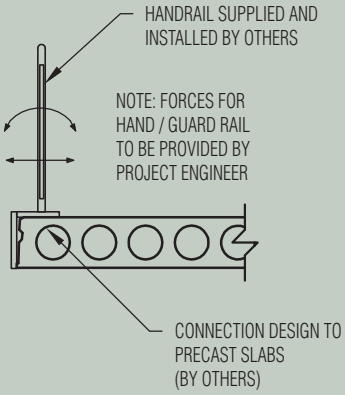
Misc 2 Cantilever Over Steel Beam



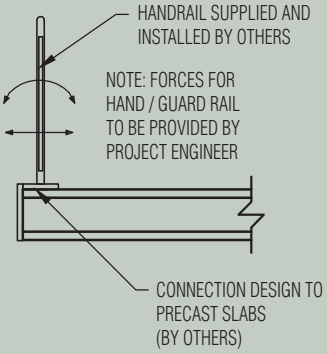
Misc 3 Stair Connection



Misc 4 Hollowcore with Cast-in Angle Cross Section

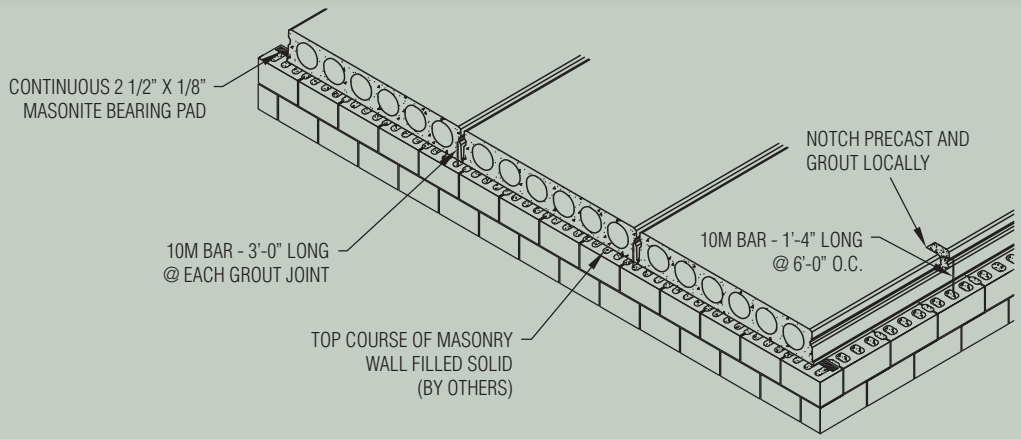


Misc 5 Handrail Connection to Hollowcore

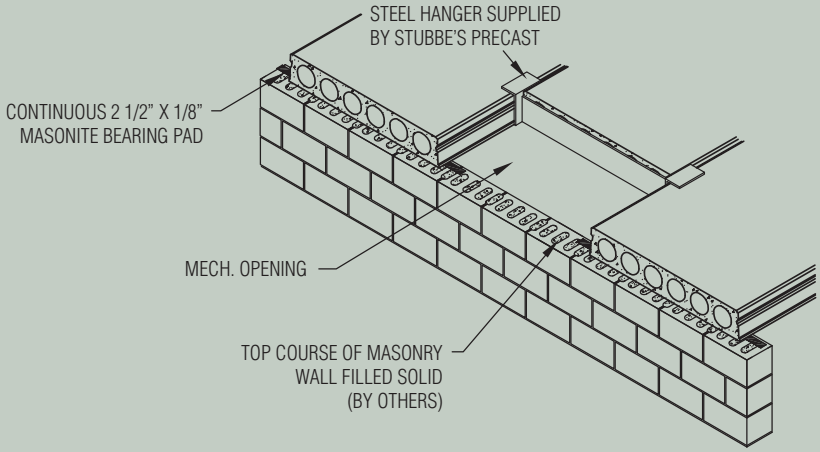


Misc 6 Handrail Connection to Hollowcore

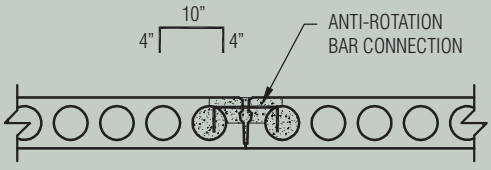
Hollow Core – Miscellaneous Connections Details

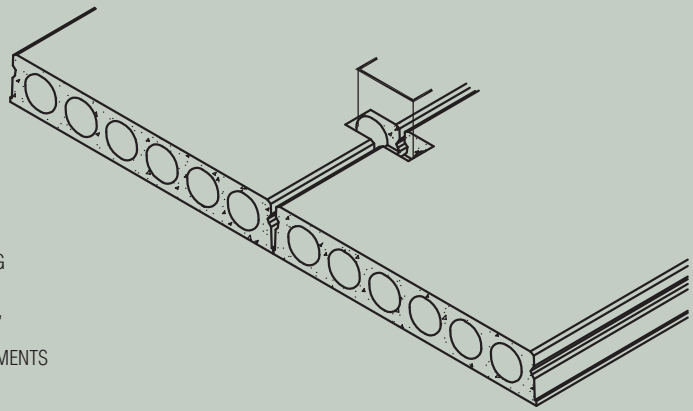


Misc 7 End Bearing Connection



Misc 8 Hanger Detail

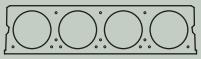




NOTE: LOCATION AND SPACING OF ANTI-ROTATION BARS WILL DEPEND ON SPECIFIED LOADS, FLOOR FINISHES, SPANS AND DIAPHRAM LOADING REQUIREMENTS

Misc 9 Anti-rotation Connection

Hollow Core Strand Patterns

Number of Strands	8" [203mm] Hollow Core	10" [254mm] Hollow Core	12" [305mm] Hollow Core	14" [356mm] Hollow Core
3		N/A	N/A	N/A
4			N/A	N/A
5		N/A		
6	N/A			
7		N/A		
8	N/A			
9	N/A	N/A		
10	N/A			
11	N/A	N/A		
Placement of Top Steel for Cantilevers or Handling (Forklift Installation)				
Top				

To keep the cost competitive, the precast is manufactured with varying numbers of strand. The above chart shows where the reinforcement is located from 3 to 11 strands in 8", 10", 12" & 14" thick hollowcore.

Hollow Core Technical Stats

FIRE RATING

The National Building Code (N.B.C.) requires the following factors in achieving a 2-hour fire rating for the precast hollow core slabs:

A) Table 2.2.A, subsection from sentence 2.2.1.(1) indicates a minimal thickness of 124 mm of equivalent thickness is required as specified under subsection 1.6 of the N.B.C. The equivalent thickness of the 200 mm (8") hollow core slab is 125 mm (therefore exceeding the 124 mm minimum).

B) Table 2.2.B. subsection from sentence 2.2.1.(2) indicates a minimal concrete coverage of 39 mm over the reinforcement strands is required. The precast extrusion machine provides the minimal 39 mm coverage.

SOUND TRANSMISSION RATING

The CPCI Metric Design Manual (second edition) indicates the following standards for the 200 mm thick hollow core slabs:

A) The Sound Transmission Rating (STC) is 50.

B) Impact Insulation Class (IIC) is 28. Floor coverings and finishes can increase the ratings (see the CPCI manual for additional information)

WARRANTY

Stubbe's Precast will guarantee the precast hollow core will be free of any defects occurred from standard usage. The precast is C.S.A. approved and is manufactured using the standard practices.

Upon substantial completion of the project the guarantee is in effect for one (1) year.

Hollow Core Specifications

1. General:
    a. Included:
        i. Precast Hollow Core floor and roof slabs.
        ii. Rebar connections.
        iii. Grouting of slab joints.

2. Reference Material:
    a. CSA A23.4-09: Precast Concrete Material & Construction.
    b. Precast Concrete Institute (PCI): Manual on Design of Connections for Precast.
    c. Precast Concrete Institute (PCI): Design Handbook – Precast & Prestressed Concrete.

3. Shop Drawings:
    a. Approval drawings will require a review by the Contractor & Design Firms under contract of each project. Discrepancies, questions & verification of design is required and returned in writing prior to commencement of production.
    b. Production drawings will bear a signed and sealed Engineer stamp, slab locations, identification marks, connection details, dimensions, openings larger than 6" in size, loadings and other relative information.

4. Quality Assurance:
    a. Conformity to PCI manual on design of connection for Precast Prestressed Concrete, PCI Design Handbook – Precast & Prestressed Concrete, CSA A23.4.

5. Accessories:
    a. Bearing pads: 1/8" thick masonite hardboard, smooth side up.
    b. Styrofoam discs: 2: thick on exterior walls only if required.
    c. Hanger frames: Welded angles used to provide large mechanical openings through precast. Size and configuration varies with opening required.

6. Finishes:
    a. Top surface:
        i. Extruded (standard surface from extruded method).
        ii. Raked (roughened surface to allow improved bond with concrete topping supplied by others).
    b. Bottom surface:
        i. "Standard" steel form finish.

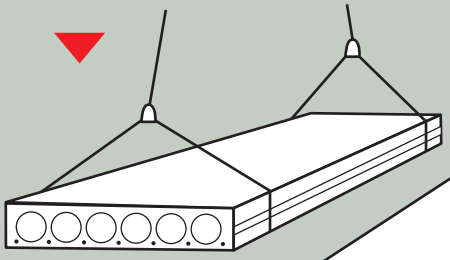
7. Installation:
    a. Install slabs with corresponding identification mark as indicated on production / shop drawing.
    b. Place bearing pads and insert Styrofoam discs in cores where required.
    c. Drill or weld tie steel rebar connections as per production / shop drawings.
    d. Grout joints between precast slabs.
    e. Drill holes for plumbing trade (located in field by others). Do not cut reinforcing strand unless engineered in the design.
    f. Latex caulking of joints between precast slabs on the underside where exposed to view.
    g. Floor preparation will vary depending on final flooring material and finish.

8. Excluded items related to precast and installation:
    a. Drypacking / infill of gap between precast and structure.
    b. Perimeter caulking between precast and structure.
    c. Drilling of holes for electrical trade.
    d. Winter heat / protection from weather conditions.
    e. Concrete topping if required in design.
    f. Clip angles around column penetrations through precast.
    g. Site / field dimensions (Contractor and Project Designers responsible to provide information during shop drawing approval).

Stubbe's Precast / Prestressed Concrete Hollow Core

Recommended Procedures

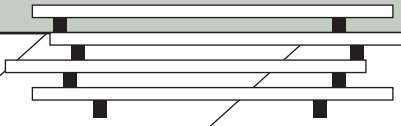
Stubbe's Hollow Core have no lifting loops and must be packed up with wire rope or sling chokers. Locate sling no more than 12" from end. Be sure all erecting equipment is sized by a competent rigger.

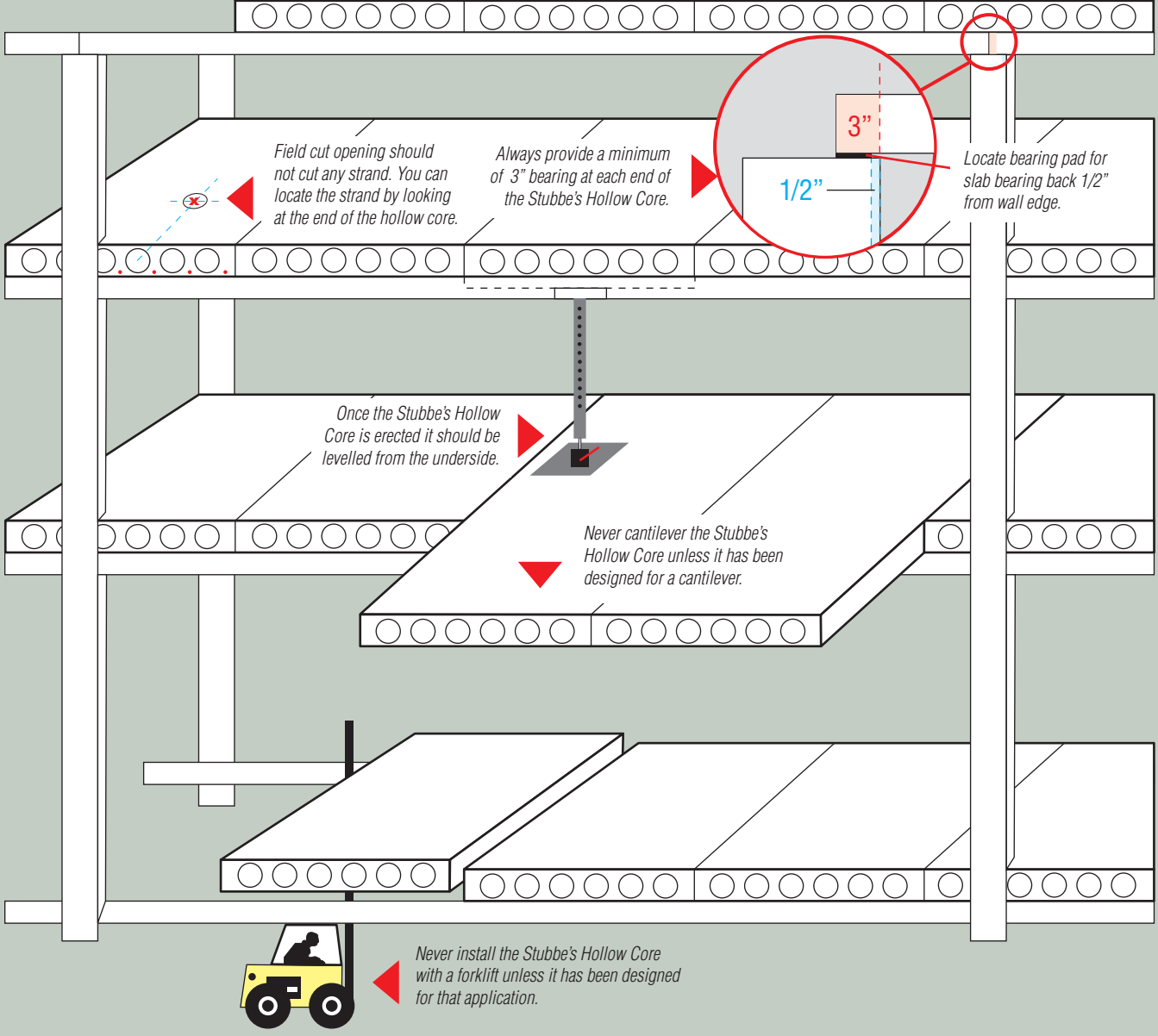


Stubbe's Hollow Core must be stacked properly to avoid cracking

Proper Stacking

Improper Stacking





Field cut opening should not cut any strand. You can locate the strand by looking at the end of the hollow core.

Always provide a minimum of 3" bearing at each end of the Stubbe's Hollow Core.

Locate bearing pad for slab bearing back 1/2" from wall edge.

Once the Stubbe's Hollow Core is erected it should be levelled from the underside.

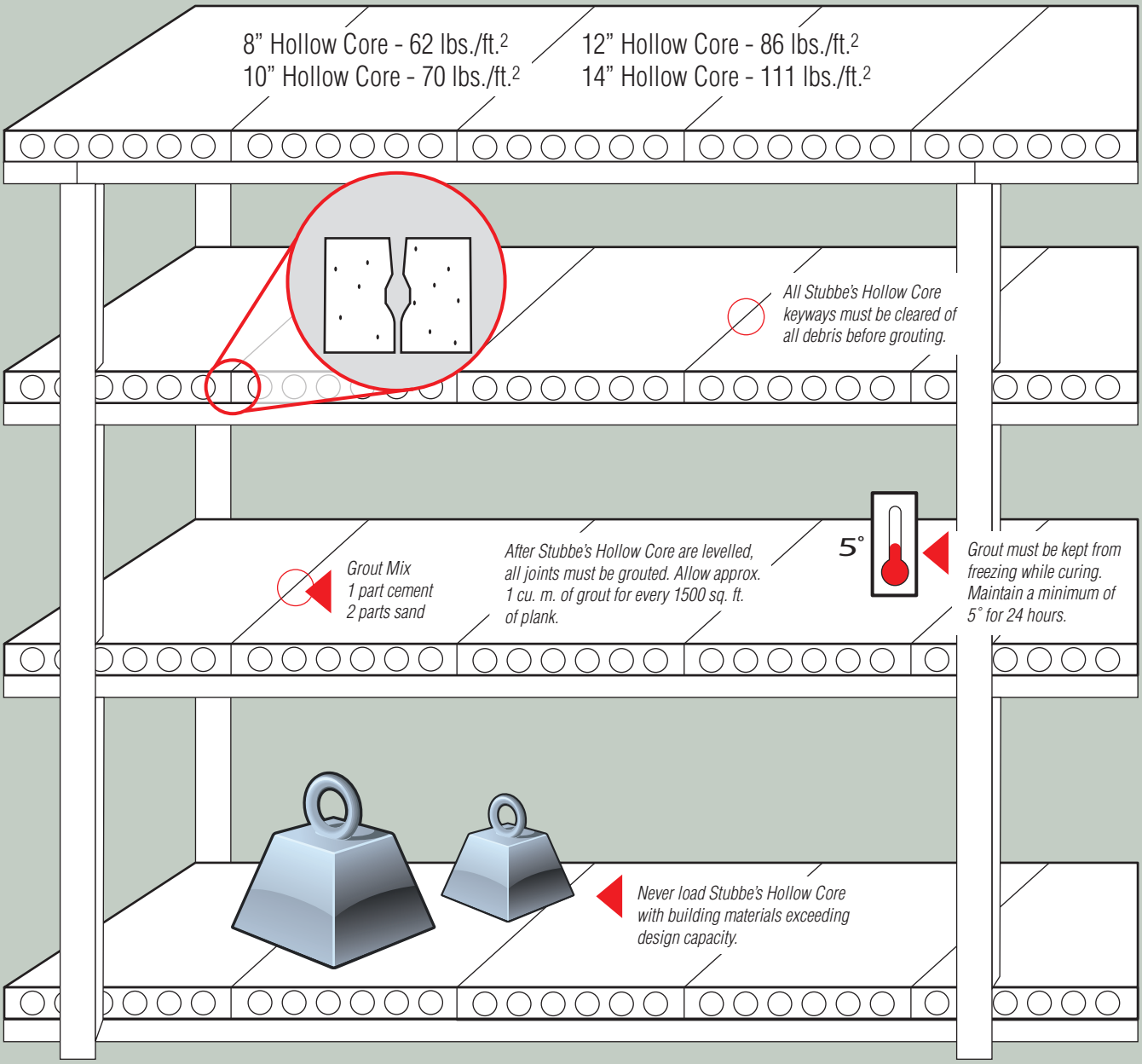
Never cantilever the Stubbe's Hollow Core unless it has been designed for a cantilever.

Never install the Stubbe's Hollow Core with a forklift unless it has been designed for that application.

continued over...

Stubbe's Precast / Prestressed Concrete Hollow Core

Recommended Procedures



For any questions or additional information contact Stubbe's Precast:

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