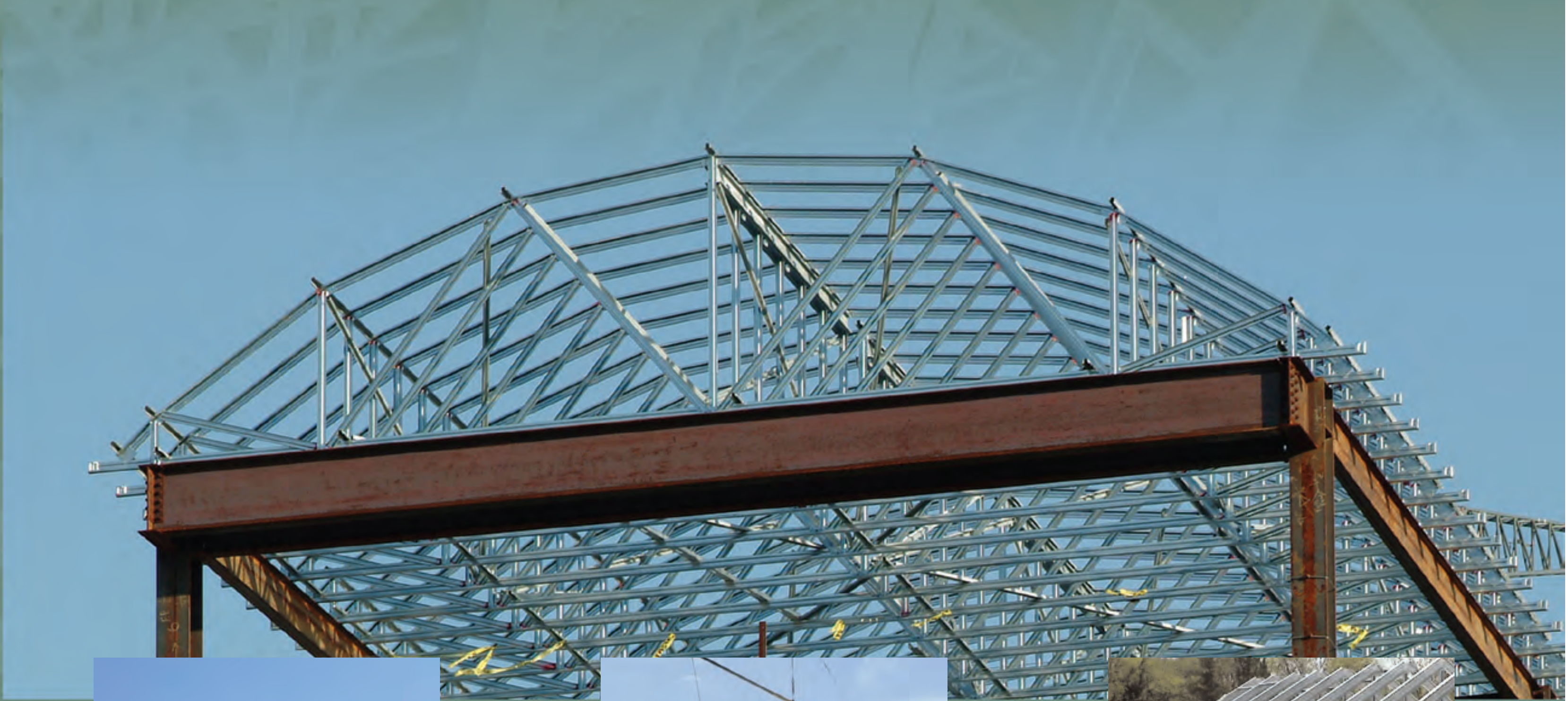
ALL-SPAN

LIGHT GAUGE STEEL TRUSS SYSTEMS



YOUR SOURCE FOR COMPLETE
LIGHT GAUGE STEEL TRUSS SYSTEMS

ALL-SPAN®, INC.

...your source for Light Gauge Steel Truss Systems.

With today's demanding architectural designs, intricate roof lines, and aggressive schedules, light gauge steel trusses have become a popular product for architects, engineers, builders and developers.

All-Span®, Inc. can design an engineered, pre-fabricated light gauge steel truss system specifically for your project, incorporating most any design, including gables, hips, valleys, dormers, retail canopy fronts, and much more.

Our truss systems are pre-fabricated in a controlled atmosphere in our plant, and shipped to your jobsite, ready for installation.

Call us at any time to discuss design possibilities for your next project.

Quality products and service based on years of experience in the building component industry.

COMPLETE SYSTEMS

- Unlimited possibilities for commercial roof design.

- Versatile Pre-fabricated Light Gauge Steel Truss Systems engineered for your specific project.

- Reliable and cost-effective way for developing large or small scale commercial, institutional or educational construction projects.

THE ULTRA-SPAN® SYSTEM

VERSATILE ▪ COST EFFECTIVE ▪ COMPREHENSIVE NON-COMBUSTIBLE

When specifying and purchasing light gauge steel trusses for your next commercial/institutional project, be sure to insist on the most comprehensive system available today. The Ultra-Span® System from Aegis Metal Framing offers building designers and contractors real peace of mind. They know all the key elements of a properly functioning structural system are designed and provided.

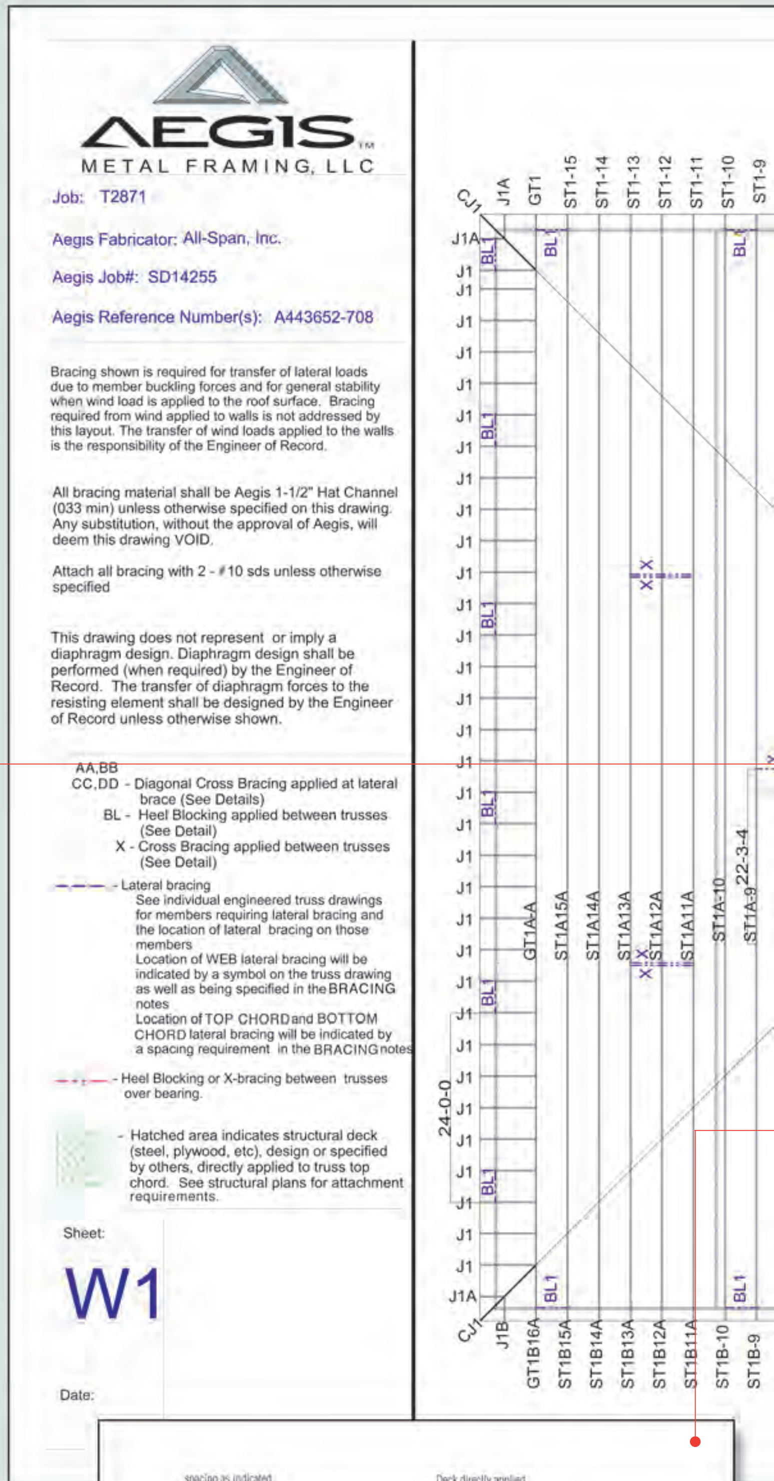
When you select All-Span® to design and manufacture your pre-fabricated truss system, you are selecting an experienced truss specialist. Utilizing state-of-the-art light gauge design software, All-Span® can efficiently and accurately bid a complete truss system that can include all of the following items:

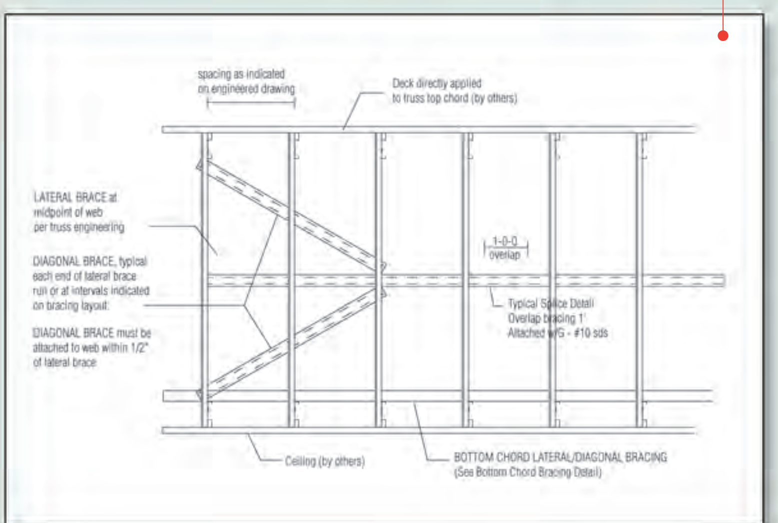
- All trusses, including girders, valleys, and specials
- Truss-to-truss and truss-to-bearing connections
- Special connections
- Truss spacing and installation bracing products
- Permanent bracing
- Hip, ridge, and valley plates

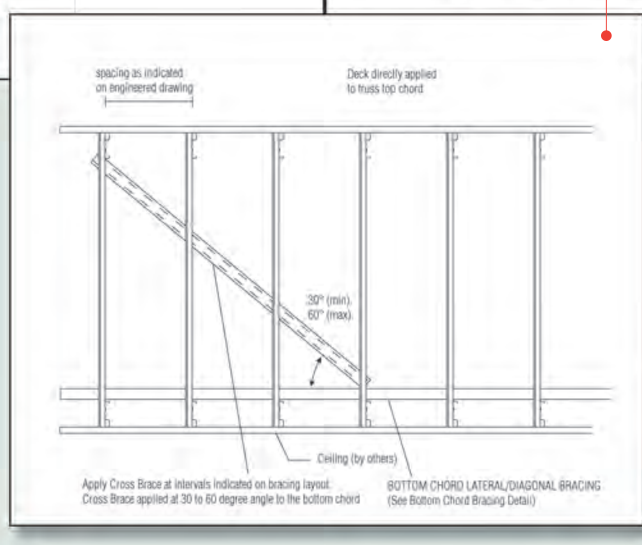
All designed and manufactured to work together as the industry's only true system!

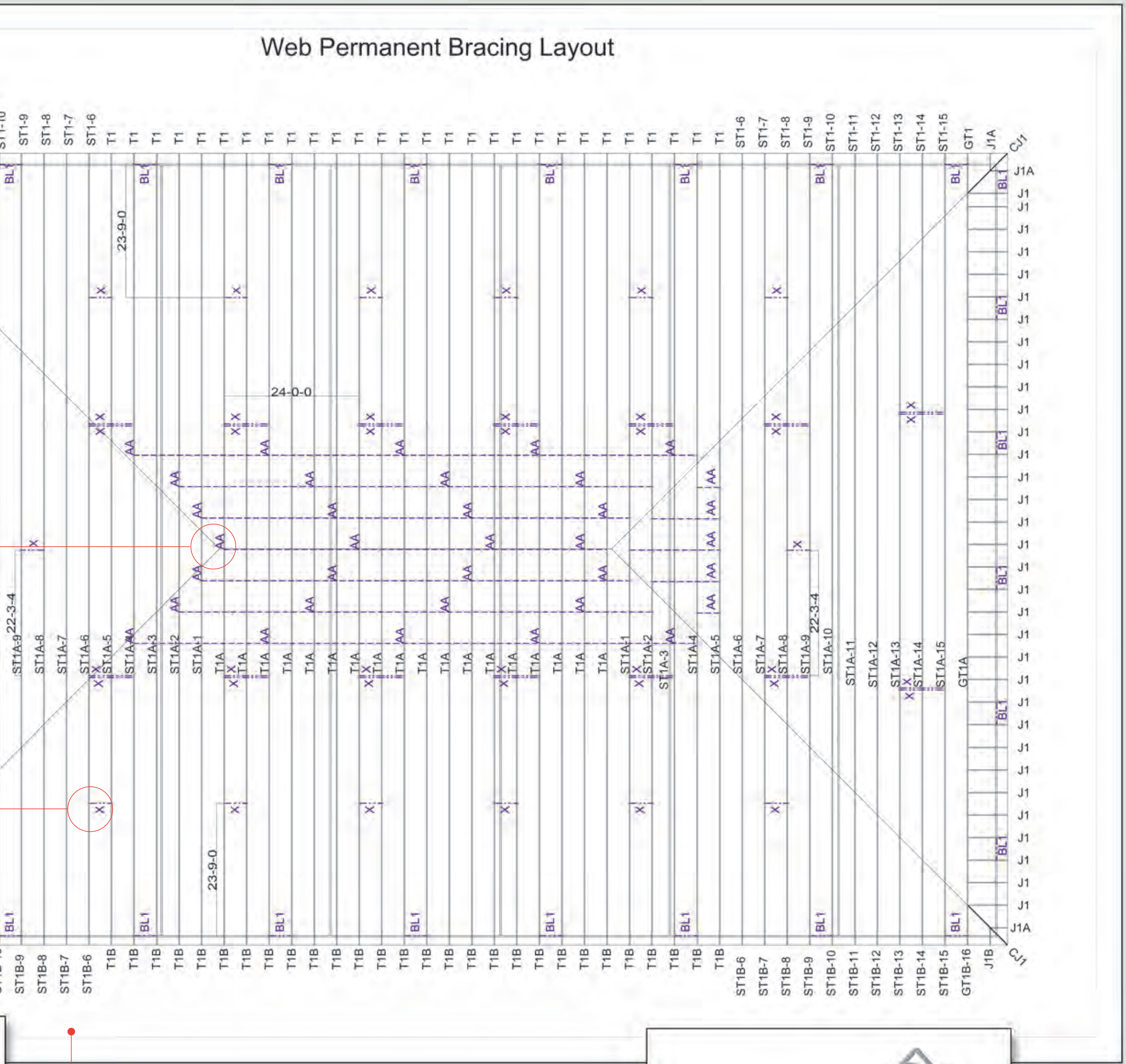
Computer designed for precision and factory built for quality and consistency, pre-fabricated Ultra-Span® trusses are the ideal, cost-effective alternative to structural steel, bar joist, fire-treated wood, and site-assembled cold formed metal framing.

Contact All-Span® for more information on the comprehensive Ultra-Span® system!







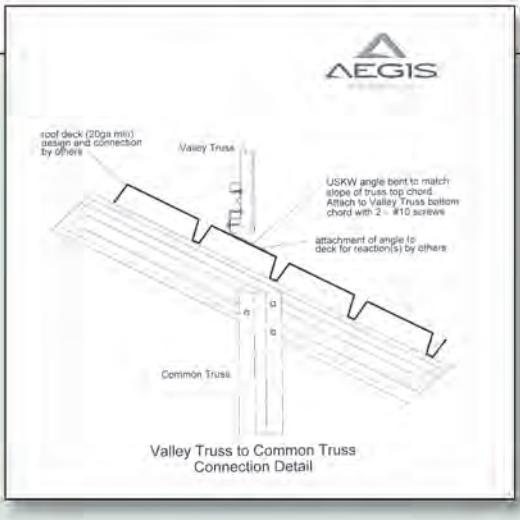


ENGINEERED BRACING LAYOUTS

These layouts specify location of all permanent lateral bracing required for each specific job. The bracing is then drawn on the layout in easy to read format. Details are provided for attachment of bracing to the trusses. This layout is stamped by a professional engineer registered in the state that the job is located. This product is especially important for jobs that have intricate truss systems.

BRACING AND SPECIAL CONNECTION DETAILS

Are provided to ensure ease of construction



ALL-SPAN, INC. PROJECT PROFILE

FABRICATOR

All-Span, Inc. Bridgeville, DE

PROJECT

Howard T. Ennis School, Georgetown, DE

Before: *The 40+ year old flat hot tar/gravel roof was beginning to fail.*

Although Ultra-Span truss systems are most commonly used in new construction, this project is an outstanding example of how Ultra-Span can be incorporated in a retrofit application.

The Howard T. Ennis School was like so many other educational facilities built during the 1960's. The one-story brick structure was designed with a flat hot tar and gravel roof system. As with most such roofs of this vintage, water leakage and seepage had become a major problem, creating a costly, repetitive maintenance nightmare. In addition, the school district wanted to install new rooftop mechanical units for each classroom that could be hidden from view.

The obvious solution to these retrofit challenges was a sloped roof with a built-in mechanical space. Although the traditional approach would have been to utilize a structural "post and purlin" system, the architect wanted to ensure sufficient area for the new air handling units, as well as minimize the number of penetrations in the existing roof membrane. **All-Span, Inc.** was brought in to help design an optimal re-roof system to provide an attractive, low maintenance sloped roof while minimizing installation time and classroom disruptions.

To minimize the number of trusses (and the installation time required), we designed two mono trusses spaced 6 feet on center to cover the 82' x 305' main school building. A short "pony wall" was built up along the exterior bearing walls and a row of stub posts spaced 6' o.c. were installed along the center of the existing roof. With only one center bearing, **the number of roof penetrations was reduced from several hundred for a traditional "post and purlin" system to only 50 or so for the Ultra-Span solution.**

Adequate installation and maintenance access for the new rooftop units was easily accomplished by designing and building a large mechanical "room" into the trusses covering those areas where the units would be located.

With the assistance of the precise layout, connection, and engineered bracing diagrams (an Ultra-Span system exclusive!) that **All-Span** provided, the truss installer was able to retrofit the Ennis school in just two weeks! And, by working evenings and weekends, no class time was lost (great news for the parents and educators, bad news for the kids!)

The Howard T. Ennis re-roof is a perfect example of how we can help compress construction cycles and reduce total cost through the speed and efficiency of pre-engineered, factory-built components.

After: *A great-looking new roof.*

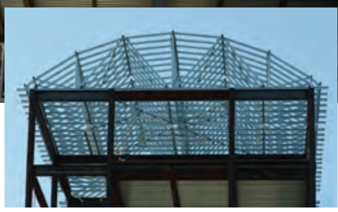
OTHER ALL-SPAN, INC. PROJECTS

FABRICATOR

All-Span, Inc. Bridgeville, DE

PROJECT

Various



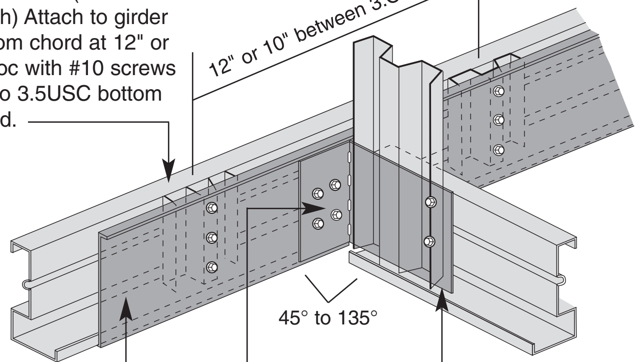
Tight radius truss design creates a striking roofline for a 7-floor building

In addition to its traditional roof shapes, this building employs a tight-radius curve as the building's signature design element.

This truss profile employs both a radius top, and built-in gutter detail.

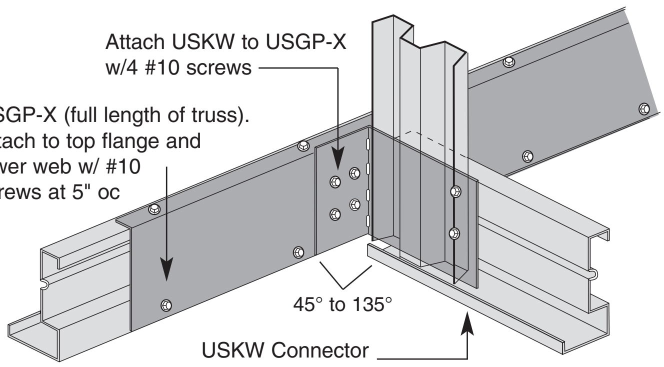
Fascia and soffit returns can be applied in our plant on most jobs.

1 TRUSS TO GIRDER CONNECTION DETAIL
Also Hip Jack to Front Face of Girder
(using the USKW and USGP System)



USW Spacing (In)	Tie-in truss bottom chd. / #10's	Allowable Tie-In Truss Reaction (lbs.) 3.5USGP w/ 3.5" USKW 35USC035	35USC046	35USC057
12	4	970	1600	1600
	6	1600		
10	4	970	1670	1900
	6	1450	1900	
	8	1900		

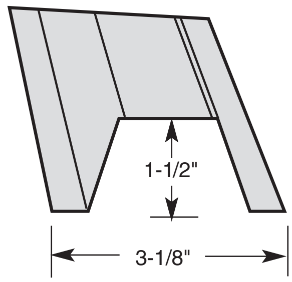
2 AEGIS® USKW CONNECTION DETAIL
Hip Jack to Back Face of Girder



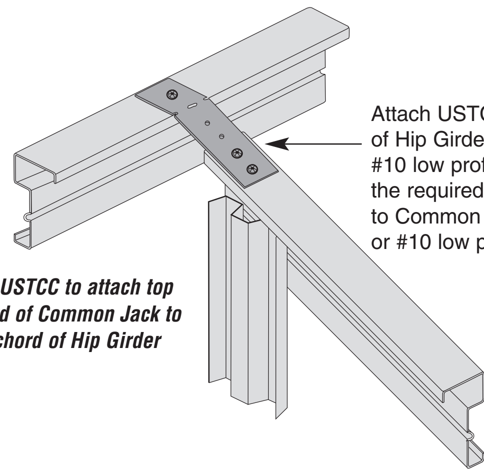
Factory installed and Skewable.

Allowable Tie-In Truss Reaction (lbs.)						
#10's	Tie-in Truss Bottom Chord					
	3.5USC20	3.5USC18	3.5USC16	5.5USC20	5.5USC18	5.5USC16
4	972	1166	1166	972	1166	1166

3 AEGIS® HAT CHANNEL
Temporary & Permanent Bracing Member

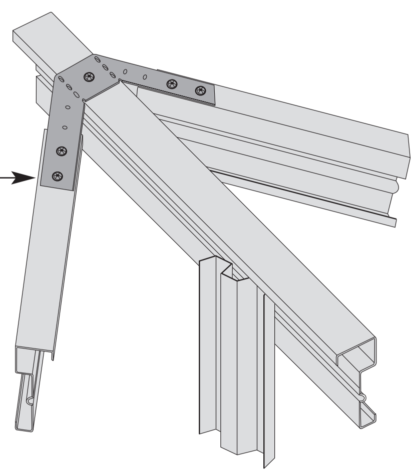


4 AEGIS® USTCC TOP CHORD CONNECTOR



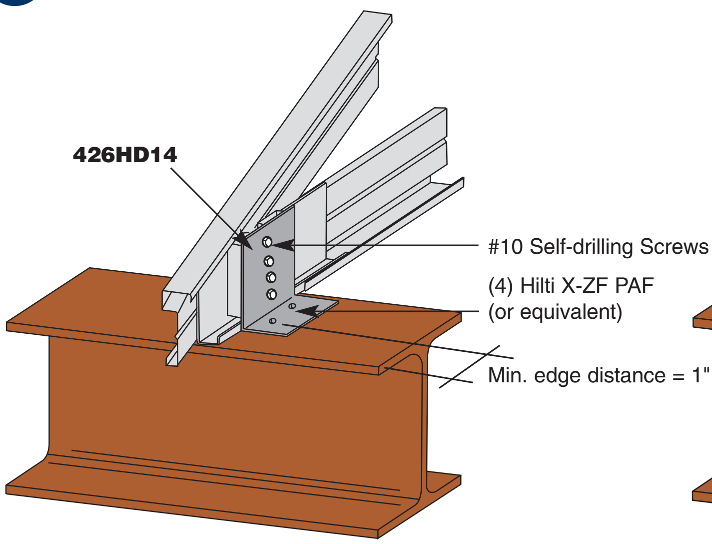
Use USTCC to attach top chord of Common Jack to top chord of Hip Girder

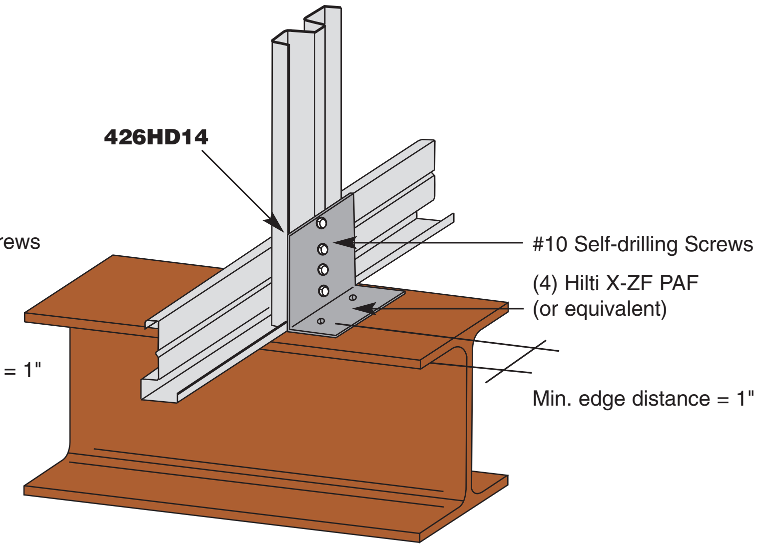
5 AEGIS® USCJC
HIP CORNER JACK CONNECTOR



Use USCJC to attach top chord of Corner Jack to top chord of Corner Girder

6 ULTRA-SPAN® TRUSS UPLIFT CONNECTION TO I-BEAM w/ 426HD14

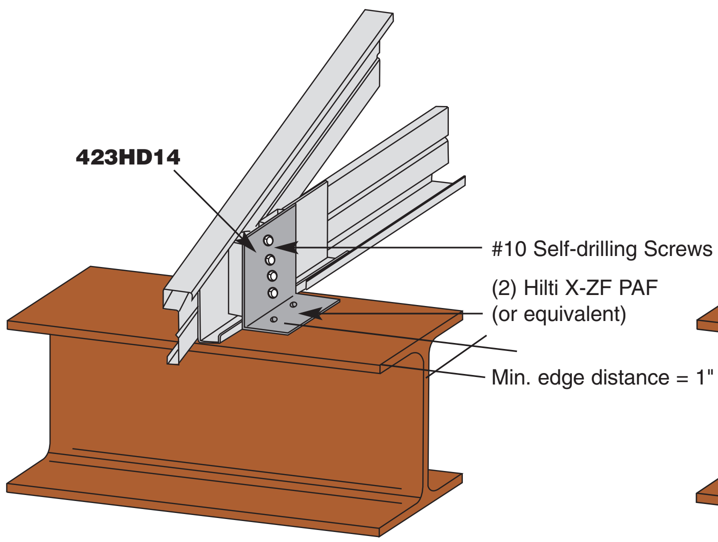


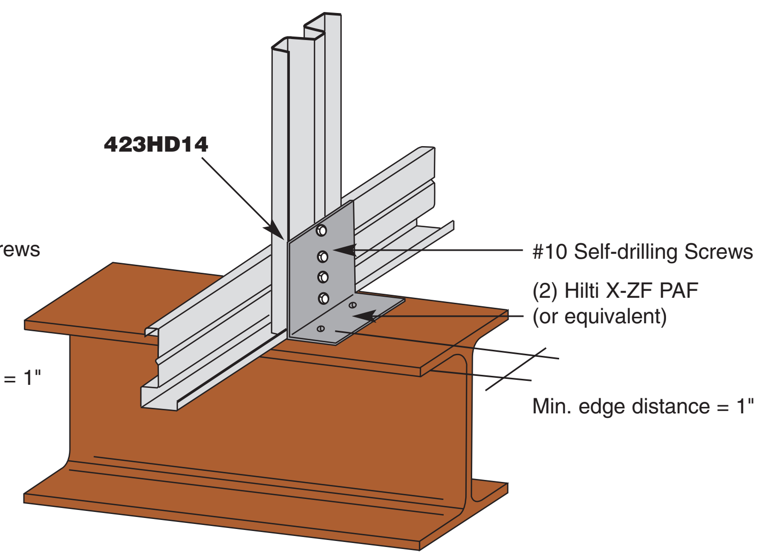


Maximum Uplift Capacity		
Web Gauge	#10 SDS	Uplift (lbs.)
035	6	1940
046	5	2400
057	4	2400

1) Web or heel stiffener attached with (8) #10 SDS.
2) Minimum screw spacing = 9/16".
3) Uplift values include 1.33 increase for wind or seismic. No further increase is permitted. For uplifts not resulting from wind or seismic, reduce capacities to 75% of values shown.
4) Minimum steel thickness = 3/8".
   See Fastener Manufacturer's recommendation for installation.
5) Fill holes in 426HD14.

7 ULTRA-SPAN® TRUSS UPLIFT CONNECTION TO I-BEAM w/ 423HD14





Maximum Uplift Capacity		
Web Gauge	#10 SDS	Uplift (lbs.)
035	4	1200
046	3	1200
057	2	1200

1) Web or heel stiffener attached with (4) #10 SDS.
2) Minimum screw spacing = 9/16".
3) Uplift values include 1.33 increase for wind or seismic. No further increase is permitted. For uplifts not resulting from wind or seismic, reduce capacities to 75% of values shown.
4) Minimum steel thickness = 3/8".
   See Fastener Manufacturer's recommendation for installation.
5) Fill holes in 423HD14.

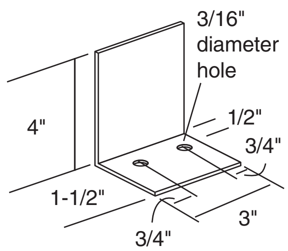
USD

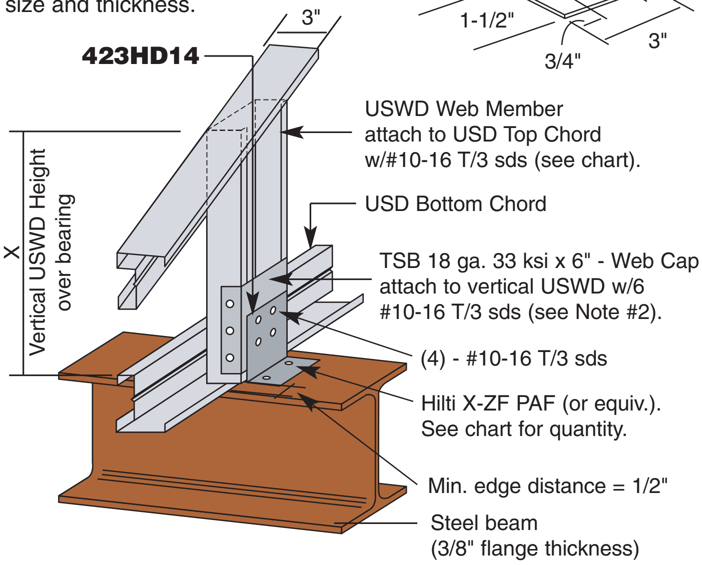
The new USD (Ultra-Span Deluxe) is a heavier, stronger member that is available to use for projects with any or all of the following design parameters:

- **Low roof pitch**
- **Wide truss spacing**
- **Low truss heel heights**
- **Heavy design loads**

8 ULTRA-SPAN® DELUXE (USD) TRUSS UPLIFT CONNECTION TO STRUCTURAL STEEL (423HD14 W/ HILTI X-ZF)

The wide flange beam shown is a general representation of a structural steel bearing. This detail may be used with other structural steel shapes (tubes, angles, etc.) provided they meet the minimum requirements for size and thickness.





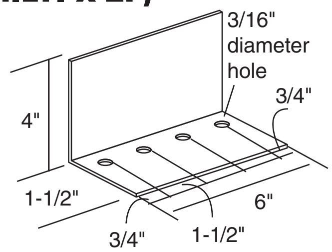
1) When permitted by building code and job specification, uplift values may be increased by 1.33. Uplift must be the direct result of wind or seismic loading. In no case shall the uplift exceed 1200 lbs.
2) TSB attachment to USWD can be reduced to (4) - #10 sds with USWD 046.
3) Minimum screw spacing and edge distance = 9/16".4) Minimum bearing width = 3".
5) Refer to Hilti product technical guide for installation requirements and application limits. Equivalent PAFs may be substituted.
6) PAFs to be placed thru or in line with holes in 423HD14.
7) When this connection detail is applied to both plies of a 2-ply truss, the listed capacities double.
8) This detail does not indicate or imply that the depicted bearing material is structurally adequate for the loads shown. Design of the bearing is required.

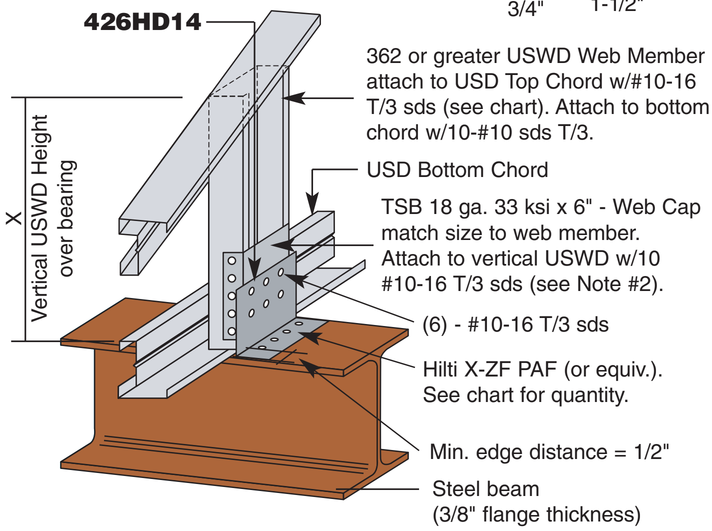
Maximum Allowable Uplift (Lbs)

Height (in) over bearing	#PAF to bearing	#10-16 T/3 SDS thru USWD to USD 4	5	6	7
X=12" or less	2	485	730	730	–
	3	–	–	–	970
12 < x < 24"	2	485	729	920	–
	3	–	–	970	1200
X > 24"	2	730	970	–	–
	3	–	–	1200	–

9 ULTRA-SPAN® DELUXE (USD) TRUSS UPLIFT CONNECTION TO STRUCTURAL STEEL (426HD14 W/ HILTI X-ZF)

The wide flange beam shown is a general representation of a structural steel bearing. This detail may be used with other structural steel shapes (tubes, angles, etc.) provided they meet the minimum requirements for size and thickness.



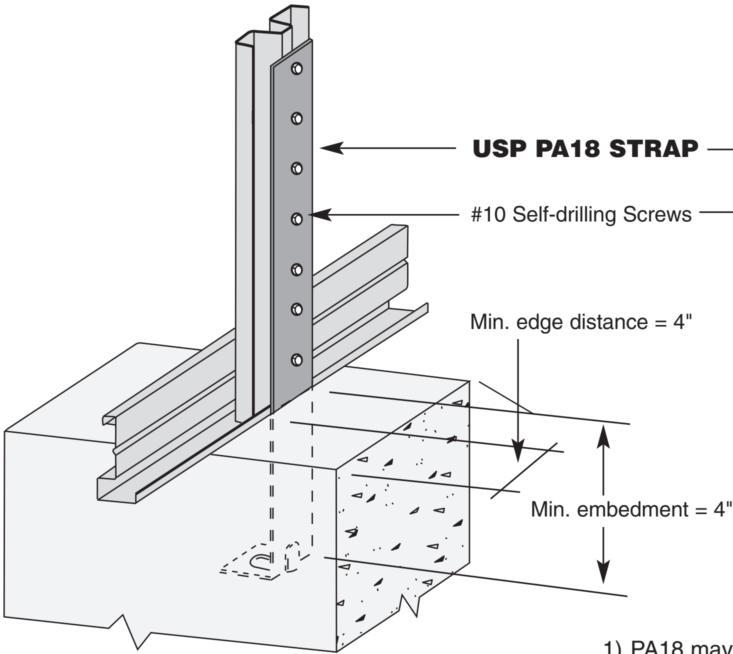


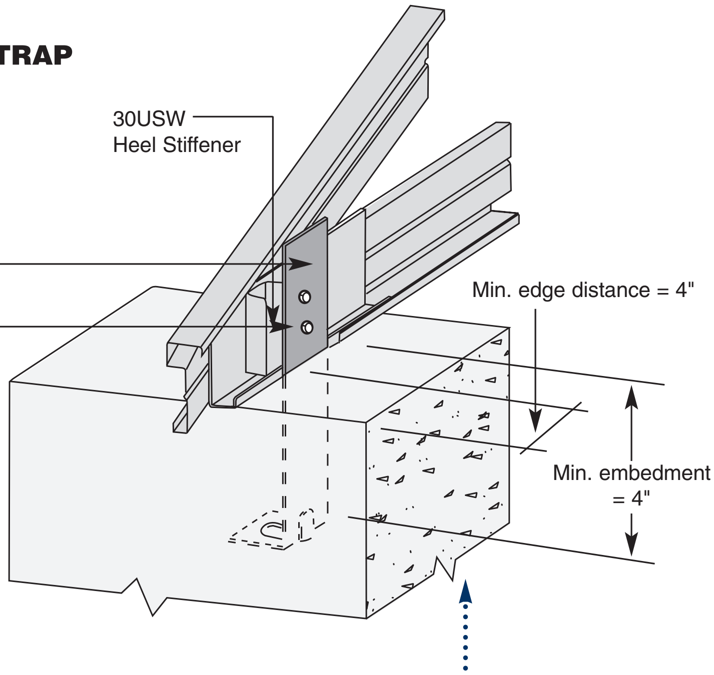
1) When permitted by building code and job specification, uplift values mabe increased by 1.33. Uplift must be the direct result of wind or seismic loading. In no case shall the uplift exceed 2400 lbs.
2) TSB attachment to USWD can be reduced to (6) - #10 sds with USWD 046.
3) Minimum screw spacing and edge distance = 9/16".
4) Minimum bearing width = 6".
5) Refer to Hilti product technical guide for installation requirements and application limits. Equivalent PAFs may be substituted.
6) PAFs to be placed thru or in line with holes in 426HD14.
7) When this connection detail is applied to both plies of a 2-ply truss,the listed capacities double.
8) This detail does not indicate or imply that the depicted bearing material is structurally adequate for the loads shown. Design of the bearing is required.

Maximum Allowable Uplift (Lbs)

Height (in) over bearing	#PAF to bearing	#10-16 T/3 SDS thru USWD to USD 10	12	14	16
X=12"	4	1200	1700	–	–
	5	–	–	1940	2110
12 < x < 24"	4	1700	1800	–	–
	5	–	1940	2000	–
X > 24"	4	1940	–	–	–
	5	–	2400	–	–

10 ULTRA-SPAN® TRUSS UPLIFT CONNECTION TO CONCRETE w/ USP PA18 STRAP





Maximum Uplift Capacity		
Web Gauge	#10 SDS	Uplift (lbs.)
035	10	3100
046	6	3100
057	5	3100

1) PA18 may be trimmed. Provide minimum 9/16" screw spacing.
2) Refer to USP catalog for proper use of PA.
3) Web or heel stiffener must be attached to chord for uplift load. Refer to chart at right for connection requirements. Use minimum gauge of web or bottom chord for determining required connection. For 073 bottom chord, use 057 connection requirements. Use heel stiffener gauge for stiffener connection.

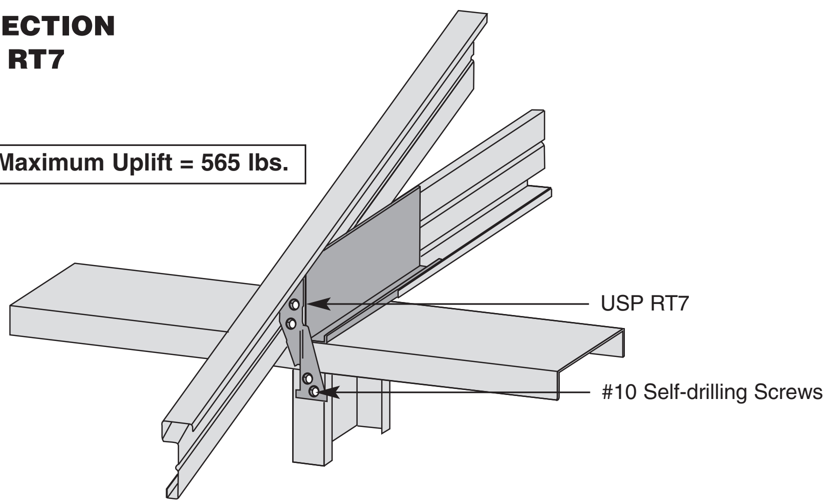
Maximum Uplift Capacity		
Stiffener Gauge	#10 SDS	Uplift (lbs.)
035	10	3100
	8	2585
	6	1940
	4	1290
	2	645
046	6	3100
	4	2225
	2	1115
057	5	3100
	4	2725
	2	1365

4) Uplift values include 1.33 increase for wind or seismic. No further increase is permitted. For uplifts not resulting from wind or seismic, reduce capacities to 75% of values shown.
5) Minimum concrete strength shall be 2000 psi.
6) PAHD42 may be used as substitute. Refer to USP catalog for installation requirements.

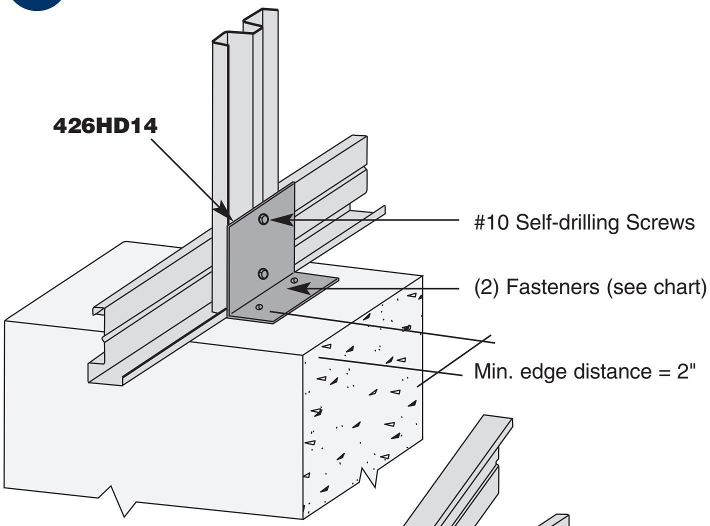
11 ULTRA-SPAN® TRUSS UPLIFT CONNECTION TO LIGHT GAUGE FRAMING w/ USP RT7

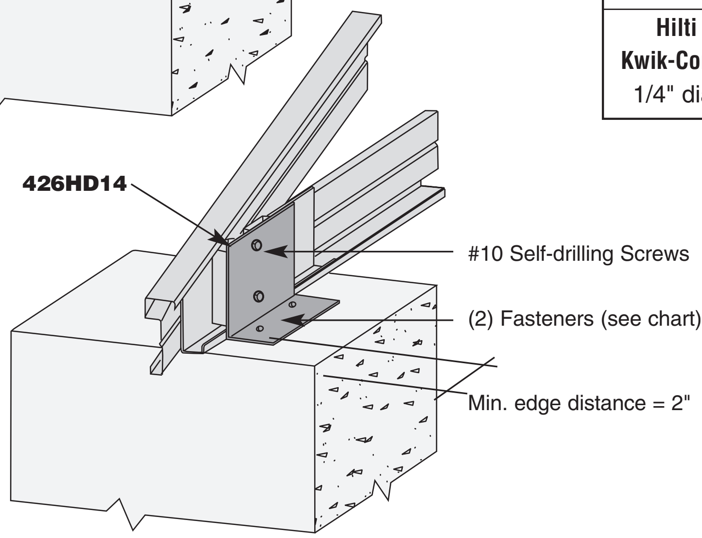
1) Uplift values include 1.33 increase for wind or seismic. No further increase is permitted. For uplifts not resulting from wind or seismic, reduce capacities to 75% of values shown.
2) Top track attachment to stud for uplift designed by qualified designer.
3) Minimum screw spacing = 9/16".

Maximum Uplift = 565 lbs.



12 ULTRA-SPAN® TRUSS UPLIFT CONNECTION TO CONCRETE w/ 426HD14

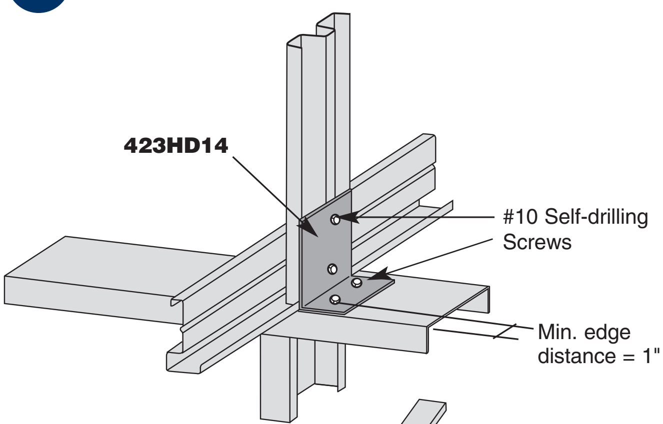


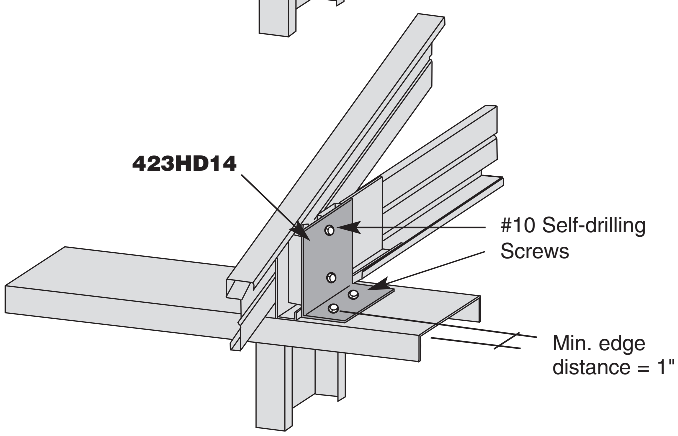


Maximum Uplift				
Fastener	Conc. psi	#10 SDS	Embed (in)	Uplift (lbs)
Hilti X-DNI	2000	2	1.25	333
		2	1.50	440
	3000	2	1.25	410
		2	1.50	505
Hilti X-ZF	2000	2	1.25	333
	3000	2	1.25	400
Hilti Kwik-Con II 3/16" dia.	2000	3	1.75	770
	4000	2	1.00	333
		3	1.75	784
Hilti Kwik-Con II 1/4" dia.	2000	4	1.75	1130
	4000	2	1.00	630
		6	1.75	1660

1) Reference manufacturer's catalog for proper installation of fasteners.
2) Web or heel stiffener must be attached to chord with (4) #10 SDS, except for 1/4" Kwik-Con II in 4000 psi concrete, 1.75 embedment use (6) #10 SDS.
3) Uplift values include 1.33 increase for wind or seismic. No further increase is permitted. For uplifts not resulting from wind or seismic, reduce capacities to 75% of values shown.
4) Install fasteners through holes provided in 426HD14.
5) Minimum spacing of fasteners = 3".
6) Minimum spacing of #10 screws = 9/16".
7) Maximum horizontal reaction = 188 lbs.

13 ULTRA-SPAN® TRUSS UPLIFT CONNECTION TO LIGHT GAUGE FRAMING w/ 423HD14





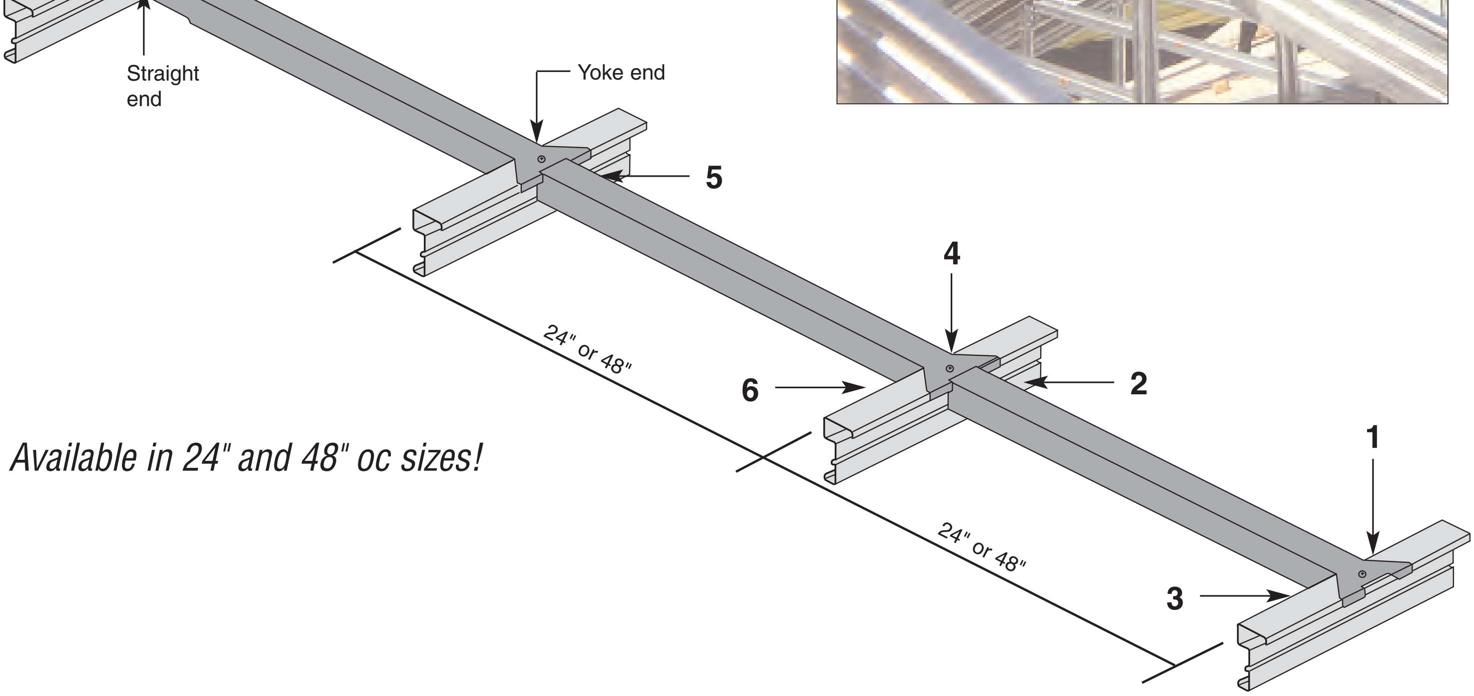
Maximum Uplift Capacity				
Web Gauge	#10 SDS Into Web	Track Gauge	#10 SDS Into Track	Uplift (lbs)
035 (20 gauge)	2	20 gauge	2	266
			3	399
			4	532
	3	18 gauge	2	442
			3	646
			4	884
	2	16 gauge	2	628
	3		3	970
	4		4	1200
	2	14 gauge	2	646
	4		3	1200

1) Uplift values include 1.33 increase for wind or seismic. No further increase is permitted. For uplifts not resulting from wind or seismic, reduce capacities to 75% of values shown.
2) Top track design and attachment to stud for uplift by qualified designer.

14 ULTRA-SPAN® STABILIZER®

Precise Truss Spacing & Installation Bracing

...All in One!



Available in 24" and 48" oc sizes!

The STABILIZER® not only spaces trusses and braces, but can remain in place as roof sheathing is applied. This is just one more way to save money on your project.

Installation instructions

Step 1 Attach STABILIZER to first truss at “yoke” end.

Step 2 Snap “straight” end of STABILIZER onto second truss.

Step 3 Install low profile self-drilling screw into “yoke” end to secure.

Step 4 Overlap “yoke” end of second STABILIZER over the “straight” end of the first STABILIZER.

Step 5 Snap “straight” end of STABILIZER onto third truss.

Step 6 Install low profile self-drilling screw into “yoke” end to secure.

LESS TIME
LESS LABOR **= MORE MONEY**

ULTRA-SPAN® STRUCTURAL PROPERTIES
ALL CHORD AND WEB MEMBERS

MEMBER DESIGNATION	DESIGN THICKNESS	GROSS SECTION PROPERTIES						EFFECTIVE SECTION PROPERTIES			YIELD	ALLOWABLE MOMENT		TORSIONAL SECTION PROPERTIES			
		WEIGHT	Area	Ix	rx	Iy	ry	Ix	Sx	Ae	Fy	(in.- lbs.)		Xo	J	Cw	Ro
	(inches)	(lbs/ft)	(in^2)	(in^4)	(in)	(in^4)	(in)	(in^4)	(in^3)	(in^2)	(ksi)	+Ma	-Ma	(in)	(in4)	(in6)	(in)
35USC 035 45	0.035	0.98	0.2834	0.4560	1.2709	0.0751	0.5158	0.4223	0.2679	0.2366	50	6564	6050	0.0306	0.000115	0.20022	1.8578
	0.889	1.46	182.838344	189814.017	32.28086	31263.14238	13.10132	175774.531	4390.586058	152.6513076	344	75.486	69.575				
35USC 046 45	0.046	1.24	0.3677	0.5911	1.2680	0.0963	0.5118	0.5820	0.3866	0.3427	50	8711	8435	0.0300	0.000259	0.25123	1.8577
	1.1684	1.85	237.193074	246034.3957	32.2072	40083.08629	12.99972	242255.0143	6335.238942	221.1092352	344	100.1765	97.0025				
35USC 057 45	0.057	1.54	0.4512	0.7215	1.2645	0.1164	0.5080	0.7215	0.4856	0.4470	50	10683	10645	0.0301	0.000489	0.29641	1.8573
	1.4478	2.29	291.1155468	300310.9736	32.1183	48449.33794	12.9032	300294.3243	7957.394408	288.38652	344	122.8545	122.4175				
35USC 073 50	0.073	1.94	0.5693	0.8990	1.2566	0.1439	1.1128	0.8990	0.6068	0.5693	50	13315	13315	0.0306	0.001011	0.35192	1.8533
	1.8542	2.89	367.2766848	374192.0516	31.91764	59895.70214	28.26512	374187.8893	9943.178823	367.2766848	344	153.1225	153.1225				
35USD 035 50	0.035	1.20	0.3520	0.5999	1.3055	0.2715	0.8783	0.5038	0.3206	0.2701	50	7812	7349	0.1094	0.000144	0.53257	2.0409
	0.889	1.79	227.0898684	249697.2322	33.1597	113006.8321	22.30882	209705.7168	5253.692718	174.2706192	344	89.838	84.5135				
35USD 046 50	0.046	1.56	0.4592	0.7792	1.3027	0.3511	0.8744	0.7085	0.4796	0.3940	50	10457	10314	0.1071	0.000324	0.67510	2.0364
	1.1684	2.32	296.2510204	324327.5268	33.08858	146138.8535	22.20976	294912.452	7859.891377	254.1672336	344	120.2555	118.611				
35USD 057 50	0.057	1.91	0.5647	0.9532	1.2992	0.4280	0.8706	0.8985	0.6248	0.5026	50	12999	13240	0.1056	0.000612	0.80519	2.0314
	1.4478	2.85	364.2960456	396751.7949	32.99968	178147.0502	22.11324	374000.5852	10239.1292	324.2445128	344	149.4885	152.26				
35 USD 073 50	0.073	2.43	0.7146	1.1918	1.2915	0.5352	0.8655	1.1463	0.8105	0.6467	50	16432	16609	0.1044	0.001269	0.97154	2.0210
	1.8542	3.62	460.999078	496064.613	32.8041	222767.059	21.9837	477126.0832	13281.87924	417.2443268	344	188.968	191.0035				
35 USD 097 50	0.097	3.31	0.9231	1.5168	1.2818	0.6761	0.8558	1.5164	1.1238	0.8605	50	21063	21061	0.1069	0.002895	1.15670	2.0086
	2.4638	4.93	595.5600992	631339.8264	32.55772	281414.0668	21.73732	631173.3338	18415.78252	555.1730832	344	242.2245	242.2015				
55USC 035 45	0.035	1.25	0.3592	1.3969	1.9719	0.0756	0.4589	1.2995	0.5186	0.2490	50	12976	11207	-0.0688	0.000147	0.45576	2.7146
	0.889	1.86	231.7672784	581433.6784	50.08626	31467.09578	11.65606	540892.7376	8498.16752	160.6254852	344	149.224	128.8805				
55USC 046 45	0.046	1.58	0.4680	1.8093	1.9663	0.0970	0.4552	1.7768	0.7365	0.3652	50	17228	16641	-0.0660	0.000330	0.57127	2.7172
	1.1684	2.35	301.9219768	753087.5183	49.94402	40374.44828	11.56208	739559.997	12068.90877	235.612432	344	198.122	191.3715				
55USC 057 45	0.057	1.96	0.5750	2.2136	1.9621	0.1172	0.4515	2.2136	0.9303	0.4879	50	21236	21139	-0.0628	0.000623	0.67525	2.7219
	1.4478	2.92	370.9411936	921369.8837	49.83734	48782.32308	11.4681	921369.8837	15244.06629	314.7542092	344	244.214	243.0985				
55 USC 073 50	0.073	2.47	0.7272	2.7817	1.9559	0.1447	1.1021	2.7817	1.1695	0.6501	50	26679	26679	-0.0579	0.001292	0.80594	2.7291
	1.8542	3.68	469.128094	1157830.957	49.67986	60228.68728	27.99334	1157830.957	19164.67135	419.4249676	344	306.8085	306.8085				
55 USD 035 50	0.035	1.61	0.4289	1.7768	2.0354	0.2718	0.7961	1.5220	0.6147	0.2825	50	15046	13197	-0.0546	0.000175	1.21910	2.9085
	0.889	2.40	276.7026724	739559.997	51.69916	113131.7015	20.22094	633504.2298	10073.78372	182.2447968	344	173.029	151.7655				
55 USD 046 50	0.046	2.09	0.5595	2.3059	2.0301	0.3514	0.7925	2.1131	0.8980	0.4164	50	20102	19660	-0.5240	0.000395	1.54360	2.9041
	1.1684	3.11	360.9799232	959788.0443	51.56454	146263.723	20.1295	879538.6254	14715.58347	268.6704304	344	231.173	226.09				
55USD 057 50	0.057	2.57	0.6884	2.8265	2.0263	0.4284	0.7889	2.6585	1.1507	0.5435	50	24950	25460	-0.0498	0.000746	1.84390	2.9018
	1.4478	3.83	444.1216924	1176478.124	51.46802	178313.5427	20.03806	1106551.245	18856.59454	350.612202	344	286.925	292.79				
55USD 073 50	0.073	3.27	0.8724	3.5620	2.0206	0.5358	0.7837	3.4137	1.4975	0.7276	50	31735	32197	-0.0457	0.001550	2.23630	2.8983
	1.8542	4.87	562.8504872	1482616.338	51.32324	223016.7978	19.90598	1420889.218	24539.62834	469.3926096	344	364.9525	370.2655				
55USD 097 50	0.097	4.45	1.1413	4.6266	2.0134	0.6870	0.7759	4.6062	2.0958	1.0214	50	41712	71745	-0.0385	0.003579	2.73490	2.8951
	2.4638	6.63	736.321108	1925736.314	51.14036	285950.9894	19.70786	1917245.193	34344.00873	658.966424	344	479.688	825.0675				
725USC 046 45	0.046	1.82	0.5485	3.6309	2.5730	0.0974	0.4212	3.5604	1.1011	0.3619	50	26542	25890	-0.1018	0.000387	0.94482	3.4846
	1.1684	2.71	353.838002	1511294.683	65.3542	40540.94085	10.69848	1481950.368	18043.79617	233.4705008	344	305.233	297.735				
725USC 057 45	0.057	2.24	0.6747	4.4498	2.5681	0.1176	0.4176	4.4498	1.3949	0.4977	50	32811	32657	-0.0981	0.000731	1.12000	3.4933

ALL-SPAN
LIGHT GAUGE STEEL TRUSS SYSTEMS

	1.1684	2.71	353.838002	1511294.683	65.3542	40540.94085	10.69848	1481950.368	18043.79617	233.4705008	344	305.233	297.735				
725USC 057 45	0.057	2.24	0.6747	4.4498	2.5681	0.1176	0.4176	4.4498	1.3949	0.4977	50	32811	32657	-0.0981	0.000731	1.12000	3.4933
	1.4478	3.34	435.2959036	1852146.598	65.22974	48948.81565	10.60704	1852146.598	22858.31557	321.1219384	344	377.3265	375.5555				
725USC 073 50	0.073	2.84	0.8545	5.5930	2.5583	0.1450	0.4123	5.5927	1.7544	0.6574	50	41269	41269	-0.0909	0.001518	1.33750	3.5056
	1.8542	4.23	551.3021232	2327982.363	64.98082	60353.55671	10.47242	2327857.494	28749.46508	424.128184	344	474.5935	474.5935				
725USD 046 50	0.046	2.38	0.6402	4.5350	2.6619	0.3516	0.7412	4.1702	1.3225	0.4126	50	30476	30256	-0.1096	0.000451	2.57130	3.7109
	1.1684	3.55	413.031432	1887609.515	67.61226	146346.9692	18.82648	1735768.291	21671.89214	266.1801128	344	350.474	347.944				
725USD 057 50	0.057	2.93	0.7881	5.5660	2.6574	0.4290	0.7374	5.2275	1.6813	0.5418	50	37794	38634	-0.1059	0.000854	3.07760	3.7110
	1.4478	4.37	508.4764024	2316744.115	67.49796	178563.2816	18.72996	2175849.777	27551.5707	349.5605912	344	434.631	444.291				
725USD 073 50	0.073	3.73	0.9998	7.0150	2.6488	0.5360	0.7322	6.6927	2.1769	0.7328	50	48042	48917	-0.1002	0.001776	3.73900	3.7088
	1.8542	5.56	645.030968	2919863.451	67.27952	223100.0441	18.59788	2785712.062	35672.99962	472.7474416	344	552.483	562.5455				
725USD 097 50	0.097	5.07	1.3105	9.1340	2.6400	0.6870	0.7241	9.0446	3.0347	1.0460	50	63439	63439	-0.0911	0.004110	4.59360	3.7112
	2.4638	7.55	845.48218	3801857.841	67.056	285950.9894	18.39214	3764646.752	49729.82312	674.83736	344	729.5485	729.5485				
25USWD 035 50	0.035	0.80	0.2248	0.2363	1.0254	0.0873	0.6231				50			-1.4677	0.000092	0.14020	1.8958
	0.035	0.80	0.2248	0.2363	1.0254	0.0873	0.6231										
30USW 035 45	0.035	0.70	0.2025	0.1882	0.9640	0.0221	0.3300				50			-0.0733	0.000083	0.03086	1.0219
	0.035	0.80	0.2248	0.2363	1.0254	0.0873	0.6231										
30USW 046 45	0.046	0.89	0.2630	0.2395	0.9543	0.0280	0.3263				50			-0.0689	0.000185	0.03849	1.0112
	0.035	0.80	0.2248	0.2363	1.0254	0.0873	0.6231										
30USW 057 45	0.057	1.11	0.3219	0.2872	0.9446	0.0335	0.3226				50			-0.0645	0.000349	0.04523	1.0005
	0.035	0.80	0.2248	0.2363	1.0254	0.0873	0.6231										
362USWD 035 50	0.035	0.95	0.2641	0.5541	1.4484	0.0997	0.6144				50			-1.3045	0.000108	0.28481	2.0438
	0.035	0.80	0.2248	0.2363	1.0254	0.0873	0.6231										
362USWD 046 50	0.046	1.27	0.3447	0.7177	1.4430	0.1279	0.6092				50			-1.2915	0.000243	0.36182	2.0301
	0.035	0.80	0.2248	0.2363	1.0254	0.0873	0.6231										
362USWD 057 50	0.057	1.46	0.4241	0.8763	1.4375	0.1547	0.6041				50			-1.2786	0.000446	0.43325	2.0165
	0.035	0.80	0.2248	0.2363	1.0254	0.0873	0.6231										
362USWD 073 50	0.073	1.89	0.5374	1.0983	1.4296	0.1913	0.5967				50			-1.2596	0.000955	0.52761	1.9966
	0.035	0.80	0.2248	0.2363	1.0254	0.0873	0.6231										
60USWD 035 50	0.035	1.25	0.3473	1.8042	2.2794	0.1167	0.5797				50			-1.0658	0.000142	0.82888	2.5822
	0.035	0.80	0.2248	0.2363	1.0254	0.0873	0.6231										
60USWD 046 50	0.046	1.68	0.4539	2.3449	2.2729	0.1498	0.5744				50			-1.0539	0.000320	1.05780	2.5703
	0.035	0.80	0.2248	0.2363	1.0254	0.0873	0.6231										
60USWD 057 50	0.057	1.93	0.5594	2.8732	2.2663	0.1812	0.5691				50			-1.0420	0.000606	1.27240	2.5584
	0.035	0.80	0.2248	0.2363	1.0254	0.0873	0.6231										
60USWD 073 50	0.073	2.52	0.7108	3.6198	2.2567	0.2241	0.5615				50			-1.0246	0.001263	1.56000	2.5412
	0.035	0.80	0.2248	0.2363	1.0254	0.0873	0.6231										

how to read member designation

35 USC 035 45

35 = 3.5"
55 = 5.5"
72 = 7.25"
30 = 3.0"
362 = 3.62"
60 = 6.0"

USC = Ultra Span Chord
USD = Ultra Span Deluxe Chord
(see page 8)
USW = Ultra Span Web
USWD = Ultra Span Web Deluxe

035 = 20 gauge
046 = 18 gauge
057 = 16 gauge
073 = 14 gauge
097 = 12 gauge

45 = 45KSI
50 = 50KSI

SECTION 05 44 00

(formerly 05425)

Pre-Engineered, Pre-Fabricated Light Gauge Steel Roof & Floor Trusses

PART 1 GENERAL

1.01 SUMMARY

A. Section includes pre-engineered, pre-fabricated light gauge cold formed steel framing elements. Work includes:

1. Light Gauge Cold-formed steel open web floor trusses.
2. Light Gauge Cold-formed steel roof trusses.
3. Anchorage, bracing and bridging.

B. Related work

1. Drywall attachment
2. Roofing, fascia, soffit

1.02 REFERENCES

Reference standards:

A. ASTM:

1. ASTM A653/A653M-94 "Sheet Steel, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot Dip Process."
2. ASTM A780-93a "Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings."

B. American Welding Society (AWS)

1. AWS D1.1 "Structural Welding Code - Steel."
2. AWS D1.3 "Structural Welding Code - Sheet Steel."

1.03 PERFORMANCE REQUIREMENTS

A. AISI "Specifications": Calculate structural characteristics of cold-formed steel truss members according to AISI's "Specification for the Design of Cold-Formed Steel Structural Members, 1986 (1990)."

B. Structural Performance: Design, engineer, fabricate, and erect cold-formed steel trusses to withstand specified design loads within limits and under conditions required.

1. Design Loads: As specified.
2. Deflections: Live load deflection meeting the following (unless otherwise specified):
   a. Floor Trusses:Vertical deflection less than or equal to 1/360 of the span.
   b. Roof Trusses:Vertical deflection less than or equal to 1/240 of the span.
3. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change (range) of 120 degrees F (67 degrees C).

1.04 SUBMITTALS

A. Submit manufacturer's product data and installation instructions for each type of cold-formed steel framing and accessory required.

B. Submit shop drawings showing member, type, location, spacing, size and gauge of members, method of attachment to supporting members and all necessary erection details. Indicate supplemental bracing, strapping, splices, bridging, accessories and details required for proper installation.

C. Submit detailed floor truss and roof truss layouts.

D. Submit truss drawings, sealed and signed by a qualified registered Professional Engineer, verifying truss' ability to meet local code and design requirements. Include:

1. Description of design criteria.
2. Engineering analysis depicting member stresses and truss deflection.
3. Truss member sizes and gauges and connections at truss joints.
4. Truss support reactions.
5. Top chord, Bottom chord and Web bracing requirements.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Fabrication shall be performed by a cold-formed steel truss fabricator with experience designing and fabricating cold-formed steel truss systems equal in material, design, and extent to the systems required for this Project.

1. Cold-Formed steel truss system installation shall be performed by an experienced installer approved by the steel truss system fabricator.

B. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code--Steel" and AWS D1.3 "Structural Welding Code--Sheet Steel."

1. Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure."

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer's unopened containers or bundles, fully identified by name, brand, type and grade. Exercise care to avoid damage during unloading, storing and erection.

B. Store trusses on blocking, pallets, platforms or other supports off the ground and in an upright position sufficiently braced to avoid damage from excessive bending.

C. Protect trusses and accessories from corrosion, deformation, damage and deterioration when stored at job site. Keep trusses free of dirt and other foreign matter.

1.07 PROJECT CONDITIONS

A. During construction, adequately distribute all loads applied to trusses so as not to exceed the carrying capacity of any one joist, truss or other component.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer: Ultra-Span® Truss Manufacturer

2.02 COMPONENTS

A. System components: Aegis Metal Framing, LLC ULTRA-SPAN® and POSI-STRUT® light gauge steel floor truss and roof truss components.

B. Provide manufacturer's standard steel truss members, bracing, bridging, blocking, reinforcements, fasteners and accessories with each type of steel framing required, as recommended by the manufacturer for the applications indicated and as needed to provide a complete light gauge cold formed steel truss system.

2.03 MATERIALS

A. Materials:

1. All component gauges: Fabricate components of structural quality steel sheet per ASTM A653 with a minimum yield strength of 50,000 psi.
2. Bracing, bridging and blocking members: Fabricate components of commercial quality steel sheet per ASTM A653 with a minimum yield strength of 33,000 psi.

B. Ultra-Span steel truss components: Provide sizes, shapes and gages indicated.

1. Design Uncoated-Steel Thickness:20 gauge, 0.0350 inch (0.91 mm).
2. Design Uncoated-Steel Thickness:18 gauge, 0.0460 inch (1.20 mm).
3. Design Uncoated-Steel Thickness:16 gauge 0.0570 inch (1.52 mm).
4. Design Uncoated-Steel Thickness:14 gauge, 0.0730 inch (1.90 mm).

C. Finish: Provide components with protective zinc coating complying with ASTM A653, minimum G60 coating.

D. Fastenings:

1. Manufacturer recommended self-drilling, self-tapping screws with corrosion-resistant plated finish. Fasteners shall be of sufficient size and number to ensure the strength of the connection.
2. Welding: Comply with AWS D1.1 when applicable and AWS D1.3 for welding base metals less than 1/8" thick.
3. Other fasteners as accepted by truss engineer.

2.04 FABRICATION

A. Factory fabricate cold-formed steel trusses plumb, square, true to line, and with connections securely fastened, according to manufacturer's recommendations and the requirements of this Section.

1. Fabricate truss assemblies in jig templates.
2. Cut truss members by sawing or shearing or plasma cutting.
3. Fasten cold-formed steel truss members by welding or screw fastening, or other methods as standard with fabricator. Wire tying of framing members is not permitted.
   a. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
   b. Locate mechanical fasteners and install according to cold-formed steel truss component manufacturer's instructions with screw penetrating joined members by not less than 3 exposed screw threads.

B. Care shall be taken during handling, delivery and erection. Brace, block, or reinforce truss as necessary to minimize member and connection stresses.

C. Fabrication Tolerances: Fabricate trusses to a maximum allowable tolerance variation from plumb, level, and true to line of 1/8 inch in 10 feet (1:960) and as follows:

1. Spacing: Space individual trusses no more than plus or minus 1/8 inch (3mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed steel truss to a maximum out-of-square tolerance of 1/8 inch (3mm).

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine structure, substrates and installation conditions. Do not proceed with cold-formed steel truss installation until unsatisfactory conditions have been corrected.

B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

3.02 INSTALLATION, GENERAL

A. General:

1. Erection of trusses, including proper handling, safety precautions, temporary bracing and other safeguards or procedures are the responsibility of the Contractor and Contractor's installer.
2. Exercise care and provide erection bracing required to prevent toppling of trusses during erection.

B. Erect trusses with plane of truss webs vertical and parallel to each other, accurately located at design spacing indicated.

C. Provide proper lifting equipment suited to sizes and types of trusses required, applied at lift points recommended by truss fabricator. Exercise care to avoid damage to truss members during erection and to keep horizontal bending of the trusses to a minimum.

D. Provide framing anchors as indicated or accepted on the engineering design drawing or erection drawings. Anchor trusses securely at bearing points.

E. Install roof framing and accessories plumb, square, true to line, and with connections securely fastened, according to manufacturer's recommendations.

1. DO NOT cut truss members without prior approval of truss engineer.
2. Fasten cold-formed steel roof framing by welding or screw fastening, as standard with fabricator. Wire tying of roof framing is not permitted.
   a. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
   b. Locate mechanical fasteners and install according to cold-formed roof framing manufacturer's instructions with screw penetrating joined members by not less than 3 exposed screw threads.

c. Install roof framing in one-piece lengths, unless splice connections are indicated.

d. Provide temporary bracing and leave in place until trusses are permanently stabilized.

F. Erection Tolerances: Install trusses to a maximum allowable tolerance variation from plumb, level, and true to line of 1/8 inch in 10 feet (1:960) and as follows:

a. Space individual trusses no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.03 OPEN WEB FLOOR TRUSS INSTALLATION

A. Install perimeter joist track or belly band sized to match trusses. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacing indicated or as recommended by the manufacturer.

B. Install trusses bearing on supporting framing, level, straight, and plumb, adjust to final position, brace, and reinforce.

1. Install trusses over supporting framing with a minimum end bearing of 1-1/2 inches (38mm).

2. Reinforce ends of trusses with web stiffeners, end clips, joist hangers, steel clip angles, steel-stud sections, or as otherwise recommended by manufacturer.

C. Space trusses not more than 2 inches (51 mm) from abutting walls, and as follows:

1. Truss Spacing: 12 inches (305 mm).

2. Truss Spacing: 16 inches (406 mm).

3. Truss Spacing: 24 inches (610 mm).

4. Truss Spacing: As indicated.

D. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists where indicated.

E. Install truss reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joists of equal length to joist reinforcement, or by other method recommended by joist manufacturer.

F. Install bridging at each end of trusses and at intervals indicated. Fasten bridging at each truss intersection as follows:

1. Bridging: Cold-rolled steel channel, fastened to bottom flange of trusses.

2. Bridging: Flat, steel-sheet straps of width and thickness indicated, fastened to bottom flange of trusses.

3. Bridging: Combination of flat, steel-sheet straps of width and thickness indicated and joist-track solid blocking of width and thickness indicated. Fasten flat straps to bottom flange of trusses and secure solid blocking to joist webs.

G. Secure trusses to load-bearing interior walls to prevent lateral movement of bottom flange.

H. Install miscellaneous truss framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

3.04 ROOF TRUSS INSTALLATION

A. Install, bridge, and brace trusses according to manufacturer's recommendations and requirements of this Section.

B. Space trusses as follows:

1. Truss Spacing: 16 inches (406 mm).

2. Truss Spacing: 24 inches (610 mm).

3. Truss Spacing: 32 inches (813 mm).

4. Truss Spacing: 48 inches (1220 mm).

C. Do not alter, cut, or remove truss members or connections of truss members.

D. Erect trusses with plane of truss webs plumb and parallel to each other, align, and accurately position at spacing indicated.

E. Erect trusses without damaging truss members or connections.

F. Align truss bottom chords with load-bearing studs or continuously reinforce track to transfer loads to structure. Anchor trusses securely at all bearing points.

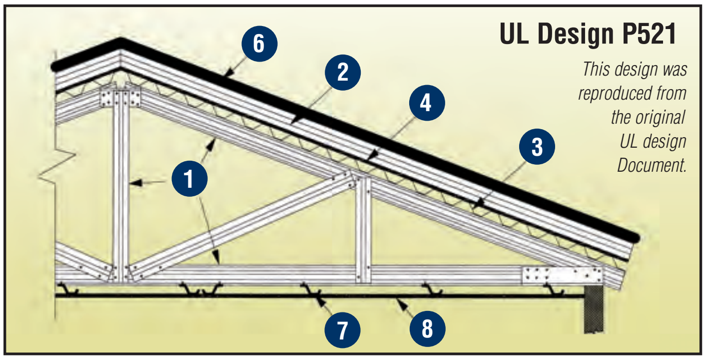
G. Install continuous bridging and permanent truss bracing per truss design requirements.

H. Install necessary roof cross and diagonal bracing per design professional recommendations.

3.05 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanizing repair paint according to ASTM A 780 and the manufacturer's instructions.

FIRE RESISTANCE RATINGS



Design No. P521

**Bearing the UL Classification Marking*

Restrained Assembly Rating: 1 and 1-1/2 hr. - (See Items 5, 5A and 5B)

Unrestrained Assembly Rating: 1, 1-1/2 hr. and 2 hr. - (See Items 5, 5A, & 5B)

1. Structural Steel Members* – Pre-fabricated light gauge steel truss system consisting of cold-formed, galvanized steel chord and web sections. Trusses fabricated in various sizes, depths, and from various steel thickness. Trusses spaced a max of 48 in. OC.

AEGIS METAL FRAMING L L C — Ultra-Span, Pre-fabricated Light Gauge Steel Truss System

2. Bridging – (Not Shown) – Location of lateral bracing for truss chord and web sections to be specified on truss engineering.

3. Steel Floor and Form Units – (Classified or Unclassified) – Corrugated or fluted steel form units, min 22 MSG painted or galv steel, welded or mechanically fastened max 12 in. OC to truss-top chords.

3A. Steel Floor and Form Units* – As an alternate to Item 3 - min 25 MSG, 15/16 in. deep, painted or galv units welded or mechanically fastened max 12 in. OC to the top chord of trusses. When used, max hourly rating is reduced to 1 hr.

LOADMASTER SYSTEMS INC – Types HD, ED or PS.

4. Cementitious Backer Units* – Nom 1/2 or 5/8 in. thick sheets. End-joists to occur over crests of steel roof deck with end-joints staggered in adjacent rows. Units loosely laid, adhered or mechanically attached to steel roof deck.

UNITED STATES GYPSUM CO – Durock Exterior Cement Board or Durock Cement Board.

4A. Gypsum Board – (Classified or Unclassified) – (Not Shown) – As an alternate to Item 4, Gypsum sheathing, min 1/2 in. thick, applied perpendicular to steel roof deck. End joints to occur over crests of steel roof deck. Sheathing loosely laid, adhered or mechanically attached to steel roof deck. See Gypsum Board (CKNX) category for names of Classified companies.

5. Roof Insulation – Foamed Plastic* – Any polyisocyanurate foamed plastic insulation boards bearing the UL Classification Marking. Min thickness is 1 in. for the 1 hr assembly ratings, 2 in. for the 1-1/2 hr assembly ratings and 4 in. for the 2 hr ratings, with no limit on max overall thickness. Boards installed over the cementitious backer units (Item 4) or gypsum sheathing (Item 4A), with the end-joints staggered in adjacent rows. When applied in more than one layer, each layer of board to be offset in both directions from layer below in order to lap all joints. Boards loosely laid, adhered or mechanically fastened to cementitious backer units or gypsum sheathing, and to steel roof deck (Item 3). See Foamed Plastic (CCVW) Category in the Fire Resistance Directory.

5A. Roof Insulation – Foamed Plastic* – (Not Shown) – As an alternate to Item 5 – For 1 and 1-1/2 hr ratings only – Any polystyrene foamed plastic insulation boards bearing the UL Classification Marking. Min thickness is 1 in. for the 1 hr assembly ratings, and 2 in. for the 1-1/2 hr assembly ratings, with no limit on max overall thickness. Boards installed over the cementitious backer units (Item 4) or gypsum sheathing (Item 4A), with the end-joints staggered in adjacent rows. When applied in more than one layer, each layer or board to be offset in both directions from layer below in order to lap all joints. Boards loosely laid, adhered or mechanically fastened to cementitious backer units or gypsum sheathing, and to steel roof deck (Item 3). See Foamed Plastic (BRYX) category in the Building Materials Directory or Foamed Plastic (CCVW) category in the Fire Resistance Directory.

5B. Roof Insulation – Mineral and Fiber Boards* – (Not Shown) – As an alternate to Item 5 – Mineral wool, glass fiber or perlite insulation boards, 24 by 48 in. min size, applied in one or more layers. Min thickness is 1 in. for the 1 hr assembly ratings, 2 in. for the 1-1/2 hr assembly rating and 4 in. for the 2 hr ratings, with no limit on max overall thickness. Boards installed over the cementitious backer units (Item 4) or gypsum sheathing (Item 4A), with the end-joints staggered in adjacent rows. When applied in more than one layer, each layer of board to be offset in both directions from layer below in order to lap all joints. Boards loosely laid, adhered or mechanically fastened to cementitious backer units or gypsum sheathing, and to steel roof deck (Item 3).

See Mineral and Fiber Boards (BQXR) Category in the Building Materials Directory or Mineral and Fiber Boards (CERZ) Category in the Fire Resistance Directory.

5C. Roof Insulation –Building Units* (Not Shown) – As an alternate to Item 5–Any polyisocyanurate foamed plastic insulation faced on the top surface with oriented strand board or faced on the underside or both sides with wood fiber board, bearing the UL Classification Marking for Fire Resistance. No min thickness of the polyisocyanurate foamed plastic core required for the 1 hr assembly ratings, min 2 in. polyisocyanurate foamed plastic core for the 1-1/2 hr assembly ratings and min 4 in. polyisocyanurate foamed plastic core for the 2 hr rating with no limit on max overall thickness. Boards installed over the cementitious backer units (Item 4) or gypsum sheathing (Item 4A), with the end-joints staggered in adjacent rows. When applied in more than one layer, each layer of board to be offset in both directions from layer below in order to lap all joints. Boards loosely laid, adhered or mechanically fastened to cementitious backer units or gypsum sheathing and to steel roof deck (Item 3). See Building Units (BZXX) category in the Fire Resistance Directory.

6. Roof Covering* – Consisting of hot-mopped or cold-application materials compatible with insulation(s) described herin which provide Class A, B or C coverings. See Roofing Materials and Systems Directory-Roof Covering Materials (TEVT).

6A. Roofing Membrane* – (Not Shown) – In lieu of Item 6, single-ply membrane that is either ballasted, adhered or mechanically attached to the insulation(s) described herin as permitted under the respective company's Classification. See Fire Resistance Directory-Roofing Membranes (CHCI) Category.

6B. Metal Roof Deck Panels* – In Lieu of or in addition to Items 6 and 6A, the roof covering may consist of mechanically fastened galv or painted steel roof deck panels. Panels may be installed above a steel purlin assembly per metal roof deck manufacturer's specifications. Steel purlin assembly to be installed transverse to steel roof trusses (Item 1). A line of sealant or tape may be used at panel side and end laps. See Metal Roof Deck Panels Category in the Roofing Materials and Systems Directory (TJPV) or Fire Resistance Directory (CETW) for names of manufacturers.

6C. Roof Covering* – In Lieu of Item 6 –Any UL Class A, B or C Prepared Roof Covering (TFWZ) acceptable for use over plywood sheathing or nonveneer APA Rated Series Sheathing. Sheathing mechanically fastened through roof insulation to top chord of steel trusses with fasteners spaced a max of 12 in. OC. As an alternate to the plywood sheathing or nonveneer APA Rated Series Sheathing, the Prepared Roof Covering (TFWZ) may be applied directly to the Building Units* (Item 5C) if the building units also carry the UL Classification Marking for Prepared Roofing Accessories (TGDY).

7. Furring Channels – Resilient channels formed of 25 MSG galv steel, installed perpendicular to the trusses (Item 1), spaced a max of 16 in. OC. Channels oriented opposite at wallboard butt-joints. Channel spices overlapped 4 in. beneath steel trusses. Channels secured to each truss with Type S-12 by 1/2 in. long screws.

7A. Furring Channels – (Not Shown) – As an alternate to Item 7 – Hat chanels min 20 MSG galv steel, min 2-5/8 in. wide by min 7/8 in. deep, installed perpendicular to the trusses (Item 1) spaced a max of 16 in. OC. Two courses of channel positioned 6 in. OC, 3 in. from each end of wallboard. Channel splices overlapped 6 in. beneath steel trusses. Channels secured to each truss with No. 18 SWG steel wire double strand saddle ties. Channels tied together with double strand of No.18 SWG steel wire at each end overlap.

7B. Furring Channels – As an alternate to Items 7 and 7A, resilient channels, double legged formed of 25 MSG galv steel, 2-7/8 in. wide by 1/2 in. deep, spaced max 16 in. OC, perpendicular to steel trusses. Two courses of resilient channel positioned 6 in. OC at wallboard butt-joints (3 in. from each end of wallboard). Channel splices overlapped 4 in. beneath steel trusses. Channels secured to each truss with Type S12 by 1/2 in. long screws or with No. 18 SWG galv steel wire double strand saddle ties. Channels tied together with double strand of No. 18 SWG galv steel wire at each end of overlap.

8. Gypsum Board* – For all ratings except the 2 Hr Assembly Ratings – One layer of nom 5/8 in. thick by 48 in. wide boards, installed with long dimension parallel to trusses. Attached to the resilient channels using 1 in. long Type S bugle-head screws spaced 12 in. OC along butted end-joints and 12 in. OC in the field. For the 2 Hr Ratings – Two layers of nom 5/8 in. thick by 48 in. wide boards, installed with long dimension parallel to trussses. Base layer attached as described above. Face layer attached to the resilient channels using 1-5/8 in. long Type S bugle-head screws spaced 12 in. OC along butted end-joints and 12 in. OC in the field. Screws staggered from base layer screws. Face layer side and end joints offset a minimum 16 in. from base layer side and end joints.

CANADIAN GYPSUM COMPANY – Types C, IP-X2, IPC-AR.

UNITED STATES GYPSUM CO – Types C, IP-X2, IPC-AR.

USG MEXICO S A DE C V – Types C, IP-X2, IPC-AR.

9. Finishing System – (Not Shown) – Vinyl, dry of premixed joint compound, applied in two coats to joints and screw heads, paper tape, 2 in. wide, embedded in first layer of compound over all joints.

Alternate Ceiling Membrane – Not shown.

10. Steel Framing Members –

a. Main runners – Installed perpendicular to Structural Steel Members – Nom 10 or 12 ft long, 15/16 in. or 1-1/2 in. wide face, spaced 4 ft OC. Main runners hung a min of 2 in. from bottom chord of Structural Steel Members with 12 SWG galv steel wire. Wires located a max of 48 in. OC.

b. Cross tees or channels – Nom 4 ft long, 15/16 in. or 1-1/2 in. wide face or cross channels, nom 4 ft long, 1-1/2 in. wide face, installed perpendicular to the main runners, spaced 16 in. OC. Additional cross tees or channels used at 8 in. from each side of butted wallboard end joints. The cross tees or channels may be riveted or screw-attached to the wall angle or channel to facilitate the ceiling installation.

c. Wall angles or channels – Used to support steel framing member ends and for screw-attachment of the gypsum wallboard – Min 0.016 in. thick painted or galvanized steel angle with 1 in. legs or min. 0.016 in.thick painted or galvanized steel channel with a 1 by 1-1/2 by 1 in. profile, attached to walls at perimeter of ceiling with fasteners 16 in. OC.

CGC INTERIORS, DIV OF CGC INC – Type DGL or RX.

USG INTERIORS INC – Type DGL or RX.

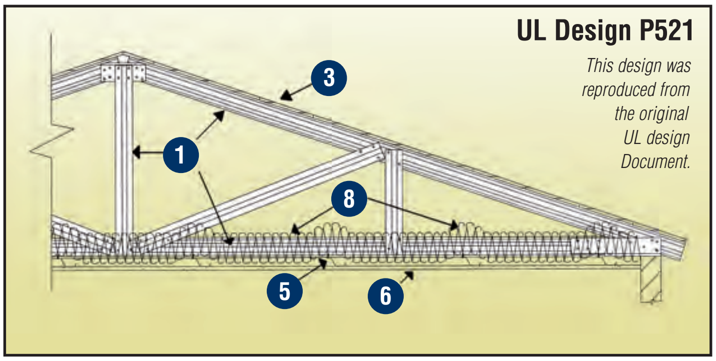
11. Gypsum Board* – For use with Steel Framing Members (Item 10) - For the 1 and 1-1/2 hr ratings - One layer of nom 5/8 in. thick by 48 in. wide boards, installed with long dimension parallel to the main runners. Wallboard fastened to each cross tee or channel with five wallboard screws, with one screw located at the midspan of the cross tee or channel, one screw located 12 in. from and on each side of the cross tee or channel mid span and one screw located 1-1/2 in. from each wallboard side joint. Except at wallboard end joints, wallboard screws shall be located on alternating sides of cross tee flange. At wallboard end joints, wallboard screws shall be located 1/2 in. from the joint. Wallboard fastened to main runners with wallboard screws 1/2 in. from side joints, midway between intersections with cross tees or channels (16 in. OC). End joints of adjacent wallboard sheets shall be staggered not less than 32 in. Wallboard sheets screw attached to leg of wall angle with wallboard screws spaced 12 in. OC. Joints treated as described in Item 8. For the 2 hr rating - Two layers of nominal 5/8 in. thick by 48 in. wide boards. Inner layer installed with long dimension perpendicular to cross tees with side joints centered along main runners and end joints centered along cross tees. Inner layer fastened to cross tees with 1-1/4 in. long Type S bugle-head steel screws spaced 8 in. OC along buted end joints and 12 in. OC in the field of the board. End joints of adjacent wallboard sheets shall be staggered not less than 4 ft OC. Outer layer attached to the cross tees through inner layer using 1-7/8 in. long Type S bugle-head steel screws spaced 8 in. OC at butted end joints and 12 in. OC in the field. Butted end joints to be centered along cross tees and be offset a min of 32 in. from end joints of inner layer. Rows of screws on both sides of butted end joints of each layer shall be located 3/8 to 1/2 in. from end joints. Butted side joints of outler layer to be offset a min of 18 in. from butted side joints of inner layer. Joints treated as described in Item 8.

CANADIAN GYPSUM COMPANY – Type C or IP-X2

UNITED STATES GYPSUM CO – Type C or IP-X2

USG MEXICO S A DE C V – Type C or IP-X2

FIRE RESISTANCE RATINGS



Design No. P523 *Bearing the UL Classification Marking

Restrained Assembly Rating – 1 and 1-1/2 hr.
Unrestrained Assembly Rating – 1 hr.

1. Structural Steel Members* – Pre-fabricated light-gauge steel truss system consisting of cold-formed, galvanized steel chord and web sections. Trusses fabricated in various sizes, depths and from various steel thicknesses. Trusses spaced a max of 48 in. OC.

AEGIS METAL FRAMING L L C – Ultra-Span, Pre-fabricated Light Gauge Steel Truss System

2. Bridging – (Not Shown) – Location of lateral bracing for truss chord and web sections to be specified on truss engineering.

3. Roof system* – Any UL Class A, B or C Roofing System (TGFU) or Prepared Roof Covering (TFWZ) acceptable for use over nom 23/32 in. thick wood structural panels, min grade "C-D" or "Sheathing" . Nom 23/32 in. thick wood structural panels mechanically fastened to top chord of steel trusses with fasteners spaced a max of 12 in. OC. As an option, the wood structural panels may be installed to min 20 ga. steel purlins or steel hat channels. Steel purlins or hat channels to be spaced a max 24 in. OC and welded or mechanically fastened, transverse to steel roof trusses (Item 1).

3A. Steel Roof Deck – Not Shown – In lieu of, or in addition to the wood structural panels described in Item 3, the steel roof deck may consist of corrugated or fluted steel form units, minimum 9/16 in. deep, 22 MSG painted or galv steel, welded or mechanically fastened at a max. 12 in. OC to the top chord of the roof trusses (Item 1). When used in addition to the wood structural panels described in Item 3, Batts and Blankets (Item 8) is optional. When used lieu of the wood structural panels described in Item 3, Batts and Blankets (Item 8) must be used and the Class A, B or C Roofing System must include a min 3/4 in. thickness of roof insulation or 1/2 in. thickness of Classified or unclassified gypsum boards. If polystyrene roof insulation is used, it must be installed on top of a min 1/2 in. thickness of Classified or unclassified gypsum boards .

3B. Steel Floor and Form Units* – As an alternate to Item 3A – min 25 MSG painted or galv units welded or mechanically fastened max 12 in. OC to the top chord of trusses (Item 1). When used in addition to the wood structural panels described in Item 3, Batts and Blankets (Item 8) is optional. When used lieu of the wood structural panels described in Item 3, Batts and Blankets (Item 8) must be used and the Class A, B or C Roofing System must include a min 3/4 in. thickness of roof insulation or 1/2 in. thickness of Classified or unclassified gypsum boards. If polystyrene roof insulation is used, it must be installed on top of a min 1/2 in. thickness of Classified or unclassified gypsum boards.

LOADMASTER SYSTEMS INC – Types HD, ED or PS.

4. Vapor Barrier – (Not Shown) – Optional – Commercial asphalt saturated felt, 0.030 in. thick, applied over the wood structural panels.

5. Furring Channels – Resilient channels formed of 25 MSG galv steel, installed perpendicular to the steel trusses (Item 1), spaced a max of 16 in. OC when no insulation (Item 8 or 8A) is fitted in the concealed space, or a max of 12 in. OC when insulation (Item 8 or 8A) is fitted in the concealed space, draped over the resilient channel/gypsum wallboard ceiling membrane. Two courses of resilient channel positioned 6 in. OC at wallboard butt-joints (3 in. from each end of wallboard). Channels oriented opposite at wallboard butt-joints. Channel splices overlapped 4 in. beneath steel trusses. Channels secured to each truss with Type S12 by 1/2 in. long screws.

5A. Furring Channels – (Not Shown) – As an alternate to Item 5 – Hat channels min 20 MSG galv steel, min 2-5/8 in. wide by min 7/8 in. deep, installed perpendicular to the trusses (Item 1) spaced a max of 16 in. OC. When no insulation (Item 8 or 8A) is fitted in the concealed space, or a max 12 in. OC when insulation (Item 8 or 8A) is fitted in the concealed space, draped over the hat channel/gypsum board ceiling membrane . Two courses of channel positioned 6 in. OC, 3 in. from each end of wallboard. Channel splices overlapped 6 in. beneath steel trusses. Channels secured to each truss with No. 18 SWG steel wire double strand saddle ties. Channels tied together with double strand of No. 18 SWG steel wire at each end overlap.

5B. Furring Channels – As an alternate to Items 5 and 5A , resilient channels, double legged formed of 25 MSG galv steel, 2-7/8 in. wide by 1/2 in. deep, installed perpendicular to the trusses (Item 1) spaced max 16 in. OC when no insulation (Item 8 or 8A) is fitted in the concealed space, or a max of 12 in. OC when insulation (Item 8 or 8A) is fitted in the concealed space, draped over the resilient channel/gypsum wallboard ceiling membrane. Two courses of resilient channel positioned 6 in. OC at wallboard butt-joints (3 in. from each end of wallboard). Channel splices overlapped 4 in. beneath steel trusses. Channels secured to each truss with Type S12 by 1/2 in. long screws or with No. 18 SWG galv steel wire double strand saddle ties. Channels tied together with double strand of No. 18 SWG galv steel wire at each end of overlap.

6. Gypsum Board* – For the 1 Hr. Ratings - One layer of nom 5/8 in. thick by 48 in. wide boards, installed with long dimension parallel to trusses. Attached to the resilient channels using 1 in. long Type S bugle-head screws. Screws spaced a max of 12 in. OC along butted end-joints and in the field when no insulation (Item 8 or 8A) is fitted in the concealed space or a max of 8 in. OC along butted end-joints and in the field when insulation (Item 8 or 8A) is fitted in the concealed space, draped over the resilient channel/gypsum wallboard ceiling membrane. For the 1-1/2 Hr. Ratings - Two layers of nom 5/8 in. thick by 48 in. wide boards, installed with long dimension parallel to trusses. Base layer attached to the resilient channels using 1 in. long Type S bugle-head screws spaced a max of 8 in. OC along butted end-joints and in the field. Face layer attached to the resilient channels using 1-5/8 in. long Type S bugle-head screws spaced a max of 8 in. OC along butted end-joints and in the field. Screws staggered from base layer screws. Face layer side and end joints offset a min 16 in. from base layer side and end joints.

CANADIAN GYPSUM COMPANY – Types C, IP-X2, IPC-AR.

UNITED STATES GYPSUM CO – Types C, IP-X2, IPC-AR.

USG MEXICO S A DE C V – Types C, IP-X2, IPC-AR.

7. Finishing System – (Not shown) – Vinyl, dry or premixed joint compound, applied in two coats to joints and screw-heads; paper tape, 2 in. wide, embedded in first layer of compound over all joints. As an alternate, nom 3/32 in. thick veneer plaster may be applied to the entire surface of gypsum wallboard.

8. Batts and Blankets* – Optional for the 1 Hr. Ratings - Any thickness mineral wool or glass fiber insulation bearing the UL Classification Marking for Surface Burning Characteristics, having a flame spread value of 25 or less and a smoke spread value of 50 or less. Insulation fitted in the concealed space, draped over the resilient channel/gypsum wallboard ceiling membrane. Mandatory for the 1-1/2 Hr. Ratings-Min 9-1/2 in. thick glass fiber insulation bearing the UL Classification Marking for Surface Burning Characteristics, having a flame spread value of 25 or less and a smoke spread value of 50 or less. Insulation fitted in the concealed space, draped over the resilient channel/gypsum wallboard ceiling membrane.

8A. Loose Fill Material* – As an alternate to Item 8 – Optional for the 1 Hr. Ratings – Any thickness of loose fill material bearing the UL Classification Marking for Surface Burning Characteristics, having a flame spread value of 25 or less and a smoke spread value of 50 or less. Insulation fitted in the concealed space, draped over the resilient channel/gypsum wallboard ceiling membrane. Mandatory for the 1-1/2 Hr. Ratings - Min 9-1/2 in. thickness of loose fill material bearing the UL Classification Marking for Surface Burning Characteristics, having a flame spread value of 25 or less and a smoke spread value of 50 or less. Insulation fitted in the concealed space, draped over the resilient channel/gypsum wallboard ceiling membrane.

Alternate Ceiling Membrane – Not Shown.

9. Steel Framing Members –

a. Main Runners – Installed perpendicular to Structural Steel Members – Nom 10 or 12 ft long, 15/16 in. or 1-1/2 in. wide face, spaced 4 ft OC. Main runners hung a min of 2 in. from bottom chord of Structural Steel Members with 12 SWG galv steel wire. Wires located a max of 48 in. OC.

b. Cross tees or channels – Nom 4 ft long, 15/16 in. or 1-1/2 in. wide face, or cross channels, nom 4 ft long, 1-1/2 in. wide face, installed perpendicular to the main runners, spaced 16 in. OC. Additional cross tees or channels used at 8 in. from each side of butted wallboard end joints. The cross tees or channels may be riveted or screw-attached to the wall angle or channel to facilitate the ceiling installation.

c. Wall angles or channels – Used to support steel framing member ends and for screw-attachment of the gypsum wallboard – Min 0.016 in. thick painted or galvanized steel angle with 1 in. legs or min. 0.016 in.thick painted or galvanized steel channel with a 1 by 1-1/2 by 1 in. profile, attached to walls at perimeter of ceiling with fasteners 16 in. OC.

CGC INTERIORS, DIV OF CGC INC – Type DGL or RX

USG INTERIORS INC – Type DGL or RX

10. Gypsum Board* – For use with Steel Framing Members (Item 9) when Batts and Blankets* (Item 8) are not used - One layer of nominal 5/8 in. thick by 48 in. wide boards, installed with long dimension parallel to the main runners. Wallboard fastened to each cross tee or channel with five wallboard screws, with one screw located at the midspan of the cross tee or channel, one screw located 12 in. from and on each side of the cross tee or channel mid span, and one screw located 1-1/2 in. from each wallboard side joint. Except at wallboard end joints, wallboard screws shall be located on alternating sides of cross tee flange. At wallboard end joints, wallboard screws shall be located 1/2 in. from the joint. Wallboard fastened to main runners with wallboard screws 1/2 in. from side joints, midway between intersections with cross tees or channels (16 in. OC). End joints of adjacent wallboard sheets shall be staggered not less than 32 in. Wallboard sheets screw attached to leg of wall angle with wallboard screws spaced 12 in. OC. Joints treated as described in Item 7. For use with Steel Framing Members* (Item 9) when Batts and Blankets* (Item 8) are used - Ratings limited to 1 Hour- 5/8 in. thick, 4 ft wide; installed with long dimension perpendicular to cross tees with side joints centered along main runners and end joints centered along cross tees. Fastened to cross tees with 1 in. long steel wallboard screws spaced 8 in. OC in the field and 8 in. OC along end joints. Fastened to main runners with 1 in. long wallboard screws spaced midway between cross tees. Screws along sides and ends of boards spaced 3/8 to 1/2 in. from board edge. End joints of the sheets shall be staggered with spacing between joints on adjacent boards not less than 4 ft OC.

CANADIAN GYPSUM COMPANY – Type C, IP-X2, IPC-AR

UNITED STATES GYPSUM CO – Type C, IP-X2, IPC-AR

USG MEXICO S A DE C V – Type C, IP-X2, IPC-AR

ALL-SPAN®

LIGHT GAUGE STEEL TRUSS SYSTEMS

AEGIS®

METAL FRAMING, LLC