YOUR SOURCE FOR COMPLETE LIGHT GAUGE STEEL TRUSS SYSTEMS
...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.
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
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.

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.

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.
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)

3.OUSW18 (full BC depth) Attach to girder bottom chord at 12" or 10" oc with #10 screws 4 into 3.5USC bottom chord.

USGP (full length of truss) Attach to USW18 w/3 - #10 screws (3.5USGP)

Attach USKW to USGP w/4 - #10 screws

USKW Connector - Attach to truss between end vertical and bottom chord w/ #10 screws as required for the tie-in truss reaction and bottom chord gauge

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

Attach USKW to USGP-X w/4 #10 screws

USGP-X (full length of truss) Attach to top flange and lower web w/ #10 screws at 5" oc

45° to 135°

USKW Connector Attach to truss between end vertical and bottom chord w/ #10 screws as required for the tie-in truss reaction and bottom chord gauge

3 AEGIS® HAT CHANNEL
Temporary & Permanent Bracing Member

3.5USG w/ 3.5" USKW

<table>
<thead>
<tr>
<th>USW</th>
<th>Allowable Tie-In Truss Reaction (lbs.)</th>
<th>35USC035</th>
<th>35USC046</th>
<th>35USC057</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td></td>
<td>970</td>
<td>1600</td>
<td>1600</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>970</td>
<td>1600</td>
<td>1600</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>1450</td>
<td>1900</td>
<td>1900</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>1450</td>
<td>1900</td>
<td>1900</td>
</tr>
</tbody>
</table>

4 AEGIS® USTCC TOP CHORD CONNECTOR

Attach USTCC to top chord of Hip Girder with (1) #8 or #10 low profile SDS. Bend to the required angle and attach to Common Jack with (2) #8 or #10 low profile SDS.

5 AEGIS® USCJC

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

Attach USCJC to top chord of Corner Girder with (1) #8 or #10 low profile SDS. Bend wings to the required angle and attach to Corner Jack with (2) #8 or #10 low profile SDS.

3-1/8" 1-1/2"
**Maximum Uplift Capacity**

<table>
<thead>
<tr>
<th>Web Gauge</th>
<th>#10 SDS</th>
<th>Uplift (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>035</td>
<td>6</td>
<td>1940</td>
</tr>
<tr>
<td>046</td>
<td>5</td>
<td>2400</td>
</tr>
<tr>
<td>057</td>
<td>4</td>
<td>2400</td>
</tr>
</tbody>
</table>

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.

---

**Maximum Uplift Capacity**

<table>
<thead>
<tr>
<th>Web Gauge</th>
<th>#10 SDS</th>
<th>Uplift (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>035</td>
<td>4</td>
<td>1200</td>
</tr>
<tr>
<td>046</td>
<td>3</td>
<td>1200</td>
</tr>
<tr>
<td>057</td>
<td>2</td>
<td>1200</td>
</tr>
</tbody>
</table>

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.
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.

---

**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.

**423HD14**

USWD Web Member attach to USD Top Chord w/#10-16 T/3 sds (see chart).

USD Bottom Chord

TSB 18 ga. 33 ksi x 6" - Web Cap attach to vertical USWD w/6 #10-16 T/3 sds (see Note #2).

Hilti X-ZF PAF (or equiv.). See chart for quantity.

Min. edge distance = 1/2"

Steel beam (3/8" flange thickness)

---

**Maximum Allowable Uplift (Lbs)**

<table>
<thead>
<tr>
<th>Height (in) over bearing</th>
<th>#PAF to bearing</th>
<th>#10-16 T/3 Sds thru USWD to USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>X=12&quot; or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>485</td>
<td>730</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>730</td>
</tr>
<tr>
<td>X &gt; 24&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>730</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>1200</td>
</tr>
</tbody>
</table>

---

**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.

**426HD14**

362 or greater USWD Web Member attach to USD Top Chord w/#10-16 T/3 sds (see chart). Attach to bottom chord w/10-10 sds T/3.

USD Bottom Chord

TSB 18 ga. 33 ksi x 6" - Web Cap match size to web member.

Attach to vertical USWD w/10 #10-16 T/3 sds (see Note #2).

Hilti X-ZF PAF (or equiv.). See chart for quantity.

Min. edge distance = 1/2"

Steel beam (3/8" flange thickness)

---

**Maximum Allowable Uplift (Lbs)**

<table>
<thead>
<tr>
<th>Height (in) over bearing</th>
<th>#PAF to bearing</th>
<th>#10-16 T/3 Sds thru USWD to USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>X=12&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1200</td>
<td>1700</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>1940</td>
</tr>
<tr>
<td>X &gt; 24&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1940</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>2400</td>
</tr>
</tbody>
</table>
ULTRA-SPAN® TRUSS UPLIFT CONNECTION TO CONCRETE w/ USP PA18 STRAP

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.
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.

Maximum Uplift Capacity

<table>
<thead>
<tr>
<th>Stiffener Gauge</th>
<th>#10 SDS</th>
<th>Uplift (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>035</td>
<td>10</td>
<td>3100</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>2585</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>1940</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>1290</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>645</td>
</tr>
<tr>
<td>046</td>
<td>6</td>
<td>3100</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>2225</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1115</td>
</tr>
<tr>
<td>057</td>
<td>5</td>
<td>3100</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>2725</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1365</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Fastener</th>
<th>Conc. psi</th>
<th>#10 SDS</th>
<th>Embed (in)</th>
<th>Uplift (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hilti</td>
<td>2000</td>
<td>2</td>
<td>1.25</td>
<td>333</td>
</tr>
<tr>
<td></td>
<td>3000</td>
<td>2</td>
<td>1.25</td>
<td>410</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>2</td>
<td>1.25</td>
<td>333</td>
</tr>
<tr>
<td>X-ZF</td>
<td>3000</td>
<td>2</td>
<td>1.25</td>
<td>400</td>
</tr>
<tr>
<td>Hilti</td>
<td>2000</td>
<td>3</td>
<td>1.75</td>
<td>770</td>
</tr>
<tr>
<td>Kwik-Con II</td>
<td>4000</td>
<td>2</td>
<td>1.00</td>
<td>333</td>
</tr>
<tr>
<td></td>
<td>4000</td>
<td>2</td>
<td>1.00</td>
<td>630</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>4</td>
<td>1.75</td>
<td>1130</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>6</td>
<td>1.75</td>
<td>1660</td>
</tr>
</tbody>
</table>

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.

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

<table>
<thead>
<tr>
<th>Web Gauge</th>
<th>#10 SDS Into Web</th>
<th>Track Gauge</th>
<th>#10 SDS Into Track</th>
<th>Uplift (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>035 (20 gauge)</td>
<td>2</td>
<td>20 gauge</td>
<td>2</td>
<td>266</td>
</tr>
<tr>
<td>035 (20 gauge)</td>
<td>2</td>
<td>20 gauge</td>
<td>3</td>
<td>399</td>
</tr>
<tr>
<td>035 (20 gauge)</td>
<td>2</td>
<td>20 gauge</td>
<td>4</td>
<td>532</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>18 gauge</td>
<td>2</td>
<td>442</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>18 gauge</td>
<td>3</td>
<td>646</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>18 gauge</td>
<td>4</td>
<td>884</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>16 gauge</td>
<td>2</td>
<td>628</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>16 gauge</td>
<td>3</td>
<td>970</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>16 gauge</td>
<td>4</td>
<td>1200</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>14 gauge</td>
<td>2</td>
<td>646</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>14 gauge</td>
<td>3</td>
<td>1200</td>
</tr>
</tbody>
</table>

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.
**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.

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.

**LESS TIME**  
**LESS LABOR**  = **MORE MONEY**
<table>
<thead>
<tr>
<th>DESIGNATION THICKNESS</th>
<th>0.035</th>
<th>0.046</th>
<th>0.057</th>
<th>0.073</th>
<th>0.088</th>
<th>0.161</th>
<th>0.213</th>
<th>0.254</th>
<th>0.300</th>
<th>0.350</th>
<th>0.420</th>
<th>0.500</th>
<th>0.600</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEIGHT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WIDTH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cw</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ro</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35USD 035 45</td>
<td>0.035</td>
<td>0.046</td>
<td>0.057</td>
<td>0.073</td>
<td>0.088</td>
<td>0.161</td>
<td>0.213</td>
<td>0.254</td>
<td>0.300</td>
<td>0.350</td>
<td>0.420</td>
<td>0.500</td>
<td>0.600</td>
</tr>
<tr>
<td>ULTRA-SPAN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALL CHORD AND WEB MEMBERS</td>
<td>ALLOWABLE MEMBER DESIGN GROSS SECTION PROPER TIES EFFECTIVE SECTION PROPER TIES YIELD MOMENT TORSIONAL SECTION PROPER TIES</td>
<td>DESIGNATION THICKNESS</td>
<td>0.035</td>
<td>0.046</td>
<td>0.057</td>
<td>0.073</td>
<td>0.088</td>
<td>0.161</td>
<td>0.213</td>
<td>0.254</td>
<td>0.300</td>
<td>0.350</td>
<td>0.420</td>
</tr>
<tr>
<td>WEIGHT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WIDTH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cw</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ro</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USC</td>
<td>USD</td>
<td>USW</td>
<td>USWD</td>
<td>35  = 3.5&quot;</td>
<td>55  = 5.5&quot;</td>
<td>72  = 7.25&quot;</td>
<td>30  = 3.0&quot;</td>
<td>362 = 3.62&quot;</td>
<td>60  = 6.0&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>---------</td>
<td>----------</td>
<td>---------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>057</td>
<td>057</td>
<td>073</td>
<td>073</td>
<td>097</td>
<td>035</td>
<td>046</td>
<td>057</td>
<td>073</td>
<td>097</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.057</td>
<td>0.057</td>
<td>0.073</td>
<td>0.073</td>
<td>0.097</td>
<td>0.035</td>
<td>0.046</td>
<td>0.057</td>
<td>0.073</td>
<td>0.097</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.24</td>
<td>2.84</td>
<td>2.38</td>
<td>3.73</td>
<td>1.11</td>
<td>0.80</td>
<td>0.89</td>
<td>1.11</td>
<td>1.11</td>
<td>1.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.674</td>
<td>0.854</td>
<td>0.640</td>
<td>0.999</td>
<td>0.3219</td>
<td>0.2284</td>
<td>0.2630</td>
<td>0.3219</td>
<td>0.3219</td>
<td>0.3219</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.448</td>
<td>5.593</td>
<td>4.550</td>
<td>7.015</td>
<td>2.872</td>
<td>1.255</td>
<td>1.424</td>
<td>2.872</td>
<td>2.872</td>
<td>2.872</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55.229</td>
<td>64.980</td>
<td>67.612</td>
<td>71.689</td>
<td>9.446</td>
<td>4.215</td>
<td>5.948</td>
<td>11.934</td>
<td>11.934</td>
<td>11.934</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.057</td>
<td>0.073</td>
<td>0.097</td>
<td>0.057</td>
<td>0.035</td>
<td>0.046</td>
<td>0.057</td>
<td>0.073</td>
<td>0.057</td>
<td>0.035</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.24</td>
<td>2.84</td>
<td>2.38</td>
<td>3.73</td>
<td>0.80</td>
<td>0.89</td>
<td>1.11</td>
<td>1.11</td>
<td>1.11</td>
<td>1.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.674</td>
<td>0.854</td>
<td>0.640</td>
<td>0.999</td>
<td>0.3219</td>
<td>0.2284</td>
<td>0.2630</td>
<td>0.3219</td>
<td>0.3219</td>
<td>0.3219</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.448</td>
<td>5.593</td>
<td>4.550</td>
<td>7.015</td>
<td>2.872</td>
<td>1.255</td>
<td>1.424</td>
<td>2.872</td>
<td>2.872</td>
<td>2.872</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55.229</td>
<td>64.980</td>
<td>67.612</td>
<td>71.689</td>
<td>9.446</td>
<td>4.215</td>
<td>5.948</td>
<td>11.934</td>
<td>11.934</td>
<td>11.934</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**How to Read Member Designation**

- **USC** = Ultra Span Chord
- **USD** = Ultra Span Deluxe Chord
- **USW** = Ultra Span Web
- **USWD** = Ultra Span Web Deluxe

<table>
<thead>
<tr>
<th>35 = 3.5&quot;</th>
<th>45 = 45KSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>035</td>
<td>20 gauge</td>
</tr>
<tr>
<td>046</td>
<td>18 gauge</td>
</tr>
<tr>
<td>057</td>
<td>16 gauge</td>
</tr>
<tr>
<td>073</td>
<td>14 gauge</td>
</tr>
<tr>
<td>097</td>
<td>12 gauge</td>
</tr>
</tbody>
</table>

Page 8
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 (Galvannealed) by the Hot Dip Process.”
   2. ASTM A794-93a “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.”
C. 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, 1996 (1999).”

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, 1996 (1999).”
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 overheating, 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, stapping, splices, bridging, and 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.
   2. Welding Standards: Comply with applicable provisions of AWS D1.1 “Structural Welding Code—Steel” and AWS D1.3 “Structural Welding Code—Sheet Steel.”
   3. Quality 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 joint, truss or other component.

PART 2 PRODUCTS

2.01 MANUFACTURER
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 trusses 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 gauges indicated.
   1. Design Uncoated-Steel Thickness: 20 gauge, 0.0500 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 G90 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 correct- ing 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 unsatisfacto- ry 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 precau- tions, 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.
   3. Erect trusses with plan of truss walls vertical and parallel to each other, accurately located at design spacing indicated.
   4. 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.
   5. Provide framing anchors as indicated or accepted on the engineer- ing design drawing or erection drawings. Anchor trusses securely at bearing points.
   6. Install roof framing and accessories plumb, square, true to line, and with connections securely fastened, according to manufactur- er’s recommendations.
   1. DO NOT cut truss members without prior approval of truss engi- neer.
   2. Fasten cold-formed steel roof framing by welding or screw fas- tening, 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 correct- ing 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.

ULTRA-SPAN®

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

(Formerly 05425)
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 (38 mm).
   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 joints where indicated.
E. Install truss reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joints 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.
Design No. P521

This design was reproduced from the original UL design Document.

Bearing the UL Classification Marking

FIRE RESISTANCE RATINGS

UL Design P521

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.

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

3. 3A. 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 in OC to truss legs.

4A. Gypsum Board – (Classified or Unclassified) – 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. Shatting loosely laid, adheired or mechanically attachted to steel roof deck. See Gypsum Board (CWW) cate

gory for names of Classified companies.

5. Roof Insulation – Foamed Plastic* – Any polysiocyanurate 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 cemen
titious 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, adheired or mechanically fastened to cemen
titious backer units or gypsum sheathing, and to steel roof deck (Item 3). See Foamed Plastic (CWWX) category in the Building Materials Directory or Foamed Plastic (CCWX) category in the Fire Resistance Directory.

6. 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 ratings and 4 in. for the 2 hr ratings, with no limit on max overall thickness. Boards installed over the cemen
titious 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, adheired or mechanically fastened to cemen

7. Furring Channels

8. Gypsum Board – (Not Shown) – As an alternate to Item 5A, resilient boards, double legged formed of 25 MSG galv steel, 2-7/8 in. wide by 1/2 in. thick, spaced max 16 in. OC, to steel trusses. Two courses of resilient channel positioned 6 in. OC, min 1 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.

9. Finishing System – (Not Shown) – Vinyl, dry in 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 1-1/16 in. wide, face spaced 4 ft OC. Main runners hang a min of 2 in. from bottom chord of Structural Steel Members with 12 MSG galv steel wires. 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 ft. in each side of butte 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 0.062 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 in. profile, attached to walls at perimeter of ceiling with fasteners 16 in. OC.

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 midpoint 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 12 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 adja
cent wallboards shall be staggered not less than 32 in. Wallboard screws attached to wall angles with wallboard screws spaced 12 in. OC. Joints treated as described in Item 8. For the 2 hr rating – Two layers of nom 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 across tees. Inner layer fastened to cross tees with 1-1/4 in. long Type S5 baffle-head steel screws spaced 12 in. OC. Baffle-head screws shall be treated as described in Item 8. For the 4 hr rating – One layer of the wall system fastened through inner layer using 1-7/8 in. long Type S5 baffle-head steel screws spaced 8 in. OC at butted end joints and 12 in. OC in the field. Bottom 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. Bottom side of outer layer in butted end joints a min of 18 in. from butted side of outer layer. Joints treated as described in Item 8.

12. Roof Covering – Consisting of hot-mopped or cold-appication materials compatible with insulation(s) described herein which provide Class A, B or C coverings. See Roofing Materials and Systems Directory-Residential Coverings (TEVT).
**Bearing the UL Classification Marking**

**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 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 1-1/2 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 screws attached to logs of wall angle with wallboard screws spaced 12 in. OC. Joints treated as described in item 7. For use of Steel Framing Members (item 9) when Batts and Blankets (item 8) are used - Ratings limited to 1 Hour - 5/8 in. thick, 4 in. 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 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

**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, no 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. Mandated 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.

**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, spaced 4 ft OC. Main runners hung a min of 2 in. from bottom chord of Structural Steel Members with 12 SWG galv steel wallboard wires. Wires located a max of 48 in. OC.

**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 1-1/2 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 screws attached to logs of wall angle with wallboard screws spaced 12 in. OC. Joints treated as described in item 7. For use of Steel Framing Members (item 9) when Batts and Blankets (item 8) are used - Ratings limited to 1 Hour - 5/8 in. thick, 4 in. 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 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

**Design No. P523**

**UL Design P521**

This design was reproduced from the original UL design Document.

**FIRE RESISTANCE RATINGS**