

TOLKO TTEC

ENGINEERED WOOD

INSTALLATION GUIDE

USA

I-JOISTS

Issue Date: May 22, 2026
Reference: IG-IJS-U1

Important: All Tolko engineered wood products are intended and warranted for use in dry-service conditions.

T-TEC I-Joists			
	Joist Depth (in.)	Flange Depth (in.)	Width (in.)
TTI 400S	7 7/8 - 16	1 1/2	2 1/2
TTI 600S	7 7/8 - 20	1 1/2	2 1/2
TTI 800S	7 7/8 - 20	1 1/2	3 1/2
TTI 900S	7 7/8 - 24	1 1/2	3 1/2

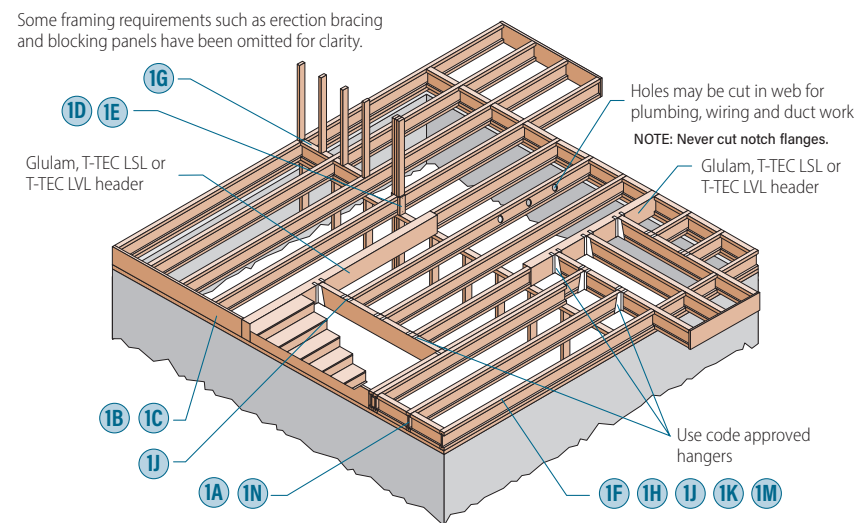
For additional information please visit [Standards / Specifications - Tolko Industries](#). In the event of any discrepancy or conflict between published information, or should any questions arise, Tolko should be contacted for clarification prior to reliance on such information.

Tolko offers authorized customers access to engineered wood design software.

To become an authorized Tolko user, please contact your Tolko EWP sales representative at:
Phone: 250-549-5311
Email: designsoftware@tolko.com



FLOOR FRAMING AND CONSTRUCTION



Installation Notes:

- 1) Before laying out floor system components, verify that T-TEC I-Joist flange widths match hanger widths. If not, contact your supplier.
- 2) Except for cutting to length, never cut, drill, or notch T-TEC I-Joist flanges.
- 3) Install T-TEC I-Joists so that top and bottom flanges are within 1/2 inch of true vertical alignment.
- 4) T-TEC I-Joists must be anchored securely to supports before floor sheathing is attached, and supports for multiple-span joists must be level
- 5) Minimum bearing lengths: 1 3/4 inches for end bearings and 3 1/2 inches for intermediate bearings.
- 6) When using hangers, seat T-TEC I-Joists firmly in hanger bottoms to minimize settlement.
- 7) Leave a 1/16 inch gap between the T-TEC I-Joist end and a header
- 8) Concentrated loads greater than those that can normally be expected in residential construction should only be applied to the top surface of the top flange. Normal concentrated loads include track lighting fixtures, audio equipment, and security cameras. Never suspend unusual or heavy loads from the T-TEC I-Joist's bottom flange. Whenever possible, suspend all concentrated loads from the top of the T-TEC I-Joist webs.
- 9) Never install T-TEC I-Joists where they will be permanently exposed to weather, or where they will remain in direct contact with concrete or masonry.
- 10) Restrain ends of floor joists to prevent rollover. Use rim board or equivalent, rim joists, or T-TEC I-Joist blocking panels.
- 11) For T-TEC I-Joists installed over and beneath bearing walls, use full depth blocking panels, rim board, or squash blocks (cripple members) to transfer gravity loads through the floor system to the wall or foundation below.
- 12) Due to shrinkage, common framing lumber set on edge may never be used as blocking or rim boards. T-TEC I-Joist blocking panels or other engineered wood products—such as rim board—must be cut to fit between the T-TEC I-Joists, and an T-TEC I-Joist-compatible depth selected.
- 13) Provide permanent lateral support of the bottom flange of all T-TEC I-Joists at interior supports of multiple-span joists. Similarly, support the bottom flange of all cantilevered T-TEC I-Joists at the end support next to the cantilever extension. In the completed structure, the gypsum wallboard ceiling provides this lateral support. Until the final finished ceiling is applied, temporary bracing or struts must be used.
- 14) If square-edge panels are used, edges must be supported between T-TEC I-Joists with 2 x 4 blocking. Glue panels to blocking to minimize squeaks. Blocking is not required under structural finish flooring, such as wood strip flooring, or if a separate underlayment layer is installed.
- 15) Nail spacing:
 - Space nails installed to the flange's top face in accordance with the applicable building code requirements or approved building plans
 - If nails must be installed into the sides of flanges, spacing shall not be closer than 3 inches o.c. for 8d common nails, and 4 inches o.c. for 10d common nails.

FLOOR FRAMING DETAILS

All nails shown in the details below are assumed to be common nails unless otherwise noted. 10d box nails may be substituted for 8d common shown in details. Individual components not shown to scale for clarity. Rated capacities for detail 1A through 1H are available at www.tolko.com

1A

Attach floor T-TEC I-Joist to wall top plate with 8d nails (slant nails) per 1B. 1

Depth (in.)	Flange (PLF)	
	2 x 3	2 x 4
≤ 16	2000	2000
18	1750	1810
20	1500	1625
22 & 24	-	1250

Attach blocking panel to wall top plate with 10d box nails (face nails) per 1C. When used for lateral shear transfer, nail to wall top plate with same nailing as required for floor sheathing.

1B

Attach T-TEC I-Joist to wall top plate with 8d nails (slant nails) per 1B. 1

Attach blocking panel to wall top plate with 10d box nails (face nails) per 1C. When used for lateral shear transfer, nail to wall top plate with same nailing as required for floor sheathing.

Attach floor T-TEC I-Joist to wall top plate with 8d nails (slant nails) per 1B. 1

Attach blocking panel to wall top plate with 10d box nails (face nails) per 1C. When used for lateral shear transfer, nail to wall top plate with same nailing as required for floor sheathing.

Attach T-TEC I-Joist to wall top plate with 8d nails (slant nails) per 1B. 1

Attach blocking panel to wall top plate with 10d box nails (face nails) per 1C. When used for lateral shear transfer, nail to wall top plate with same nailing as required for floor sheathing.

1C

T-TEC rim I-joist vertical load transfer. See detail 1A for capacities.

Attach T-TEC rim I-joist to floor joist with one nail at top and bottom. Nail must provide 1" minimum penetration into floor joist. Toe nails may be used.

Attach T-TEC I-Joist per 1B.

Attach rim joist to top plate per 1A.

Min. 1 3/4" bearing required

1D

T-TEC I-joist rim blocking panel per 1A

Squash block

Provide lateral bracing per 1A, 1B or 1C.

1/8" for lumber squash blocks

1E

Transfer load from above to bearing below. Install squash blocks per 1D. Match bearing area of blocks below to post above.

1F

Provide backer for siding attachment unless nailable sheathing is used.

For single T-TEC I-Joist, see detail 1A for capacities. For double T-TEC I-Joists the table capacities may be doubled. Filler block is not required with this detail.

Wall sheathing, as required

Rim board may be used in lieu of T-TEC I-Joists. Backer is not required when rim board is used.

1G

Load bearing wall above shall align vertically with the wall below. Other conditions such as offset walls are not covered by this detail.

Blocking required over all interior supports.

8d nails at 6" o.c.

Blocking panel see details 1A and 1B for vertical load capacities.

Joist attachment per detail B.1

1H

Backer block Before installing a backer block to a double I-joist, drive three additional 10d nails through the webs and filler block where the backer block will fit. Clinch. Install backer tight to top flange. Use twelve 10d nails, clinched when possible. Verify hanger capacity with hanger manufacturer.

Backer blocks (Blocks must be long enough to permit required nailing without splitting)

Flange Width	Material Thickness Required*	Minimum Depth**
2 1/2"	1"	5 1/2"
3 1/2"	1 1/2"	7 1/4"

*Minimum grade for backer block material shall be Utility grade SPF (south) or better for solid sawn lumber and Rated Sheathing grade for wood structural panels.
**For face-mount hangers use net joist depth minus 3 1/4".

Top - or face - mounted hanger

Double T-TEC I-Joist header

Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

For hanger capacity see hanger manufacturer's recommendations. Verify double T-TEC I-Joist capacity to support concentrated loads.

Filler block

Backer block required (both sides for face-mounted hangers)

1J

Glulam or multiple structural T-TEC LSL or T-TEC LVL

For nailing schedules for multiple T-TEC LSL or T-TEC LVL beams, see Tolko T-TEC Headers, Beams & Columns Installation Guide IG-HBC-U.

Top - or face - mounted hanger installed per manufacturer's recommendations

Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

1K

2x plate flush with inside of wall or beam

Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

Top-mounted hanger installed per manufacturer's recommendations

1M

Multiple T-TEC I-joist header with full depth filler block shown. Glulam and multiple T-TEC LSL or T-TEC LVL headers may also be used. Verify double T-TEC I-joist capacity to support concentrated loads.

Backer block attach per 1H. Nail with twelve 10d nails, clinch when possible.

Filler block

Install framing anchor per manufacturer's recommendations (both sides of stringer)

1N

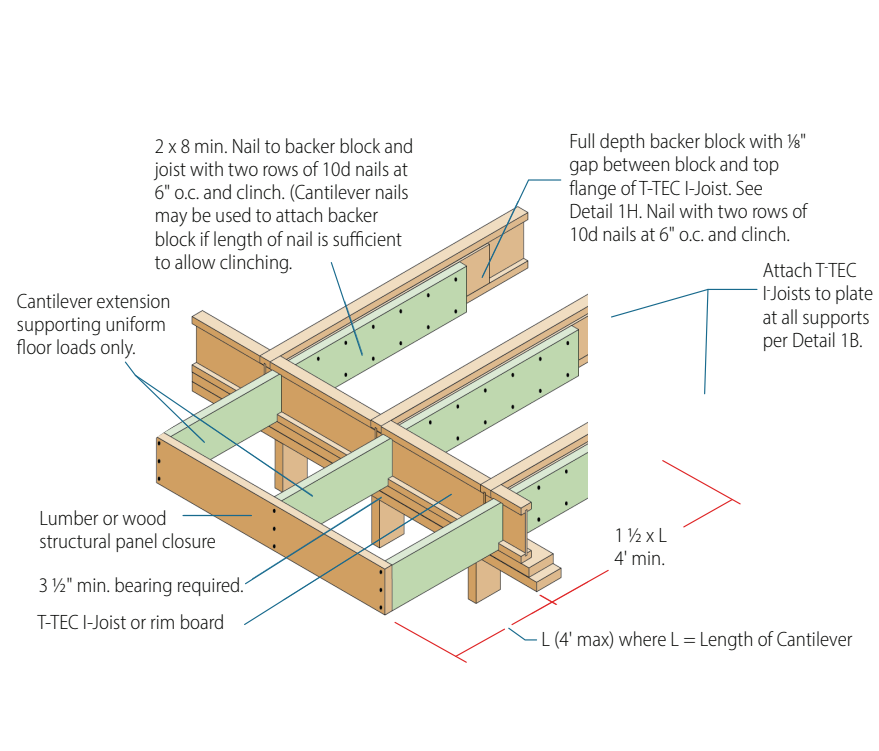
Do not bevel-cut joist beyond inside face of wall.

Attach T-TEC I-Joist per 1B

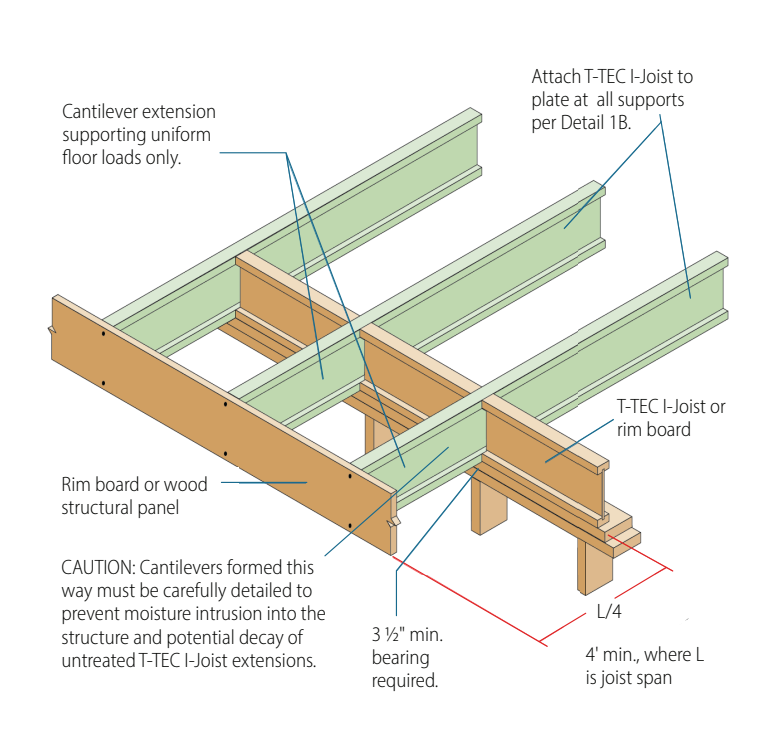
Note: Blocking required at bearing for lateral support, not shown for clarity.

CANTILEVER FRAMING DETAILS

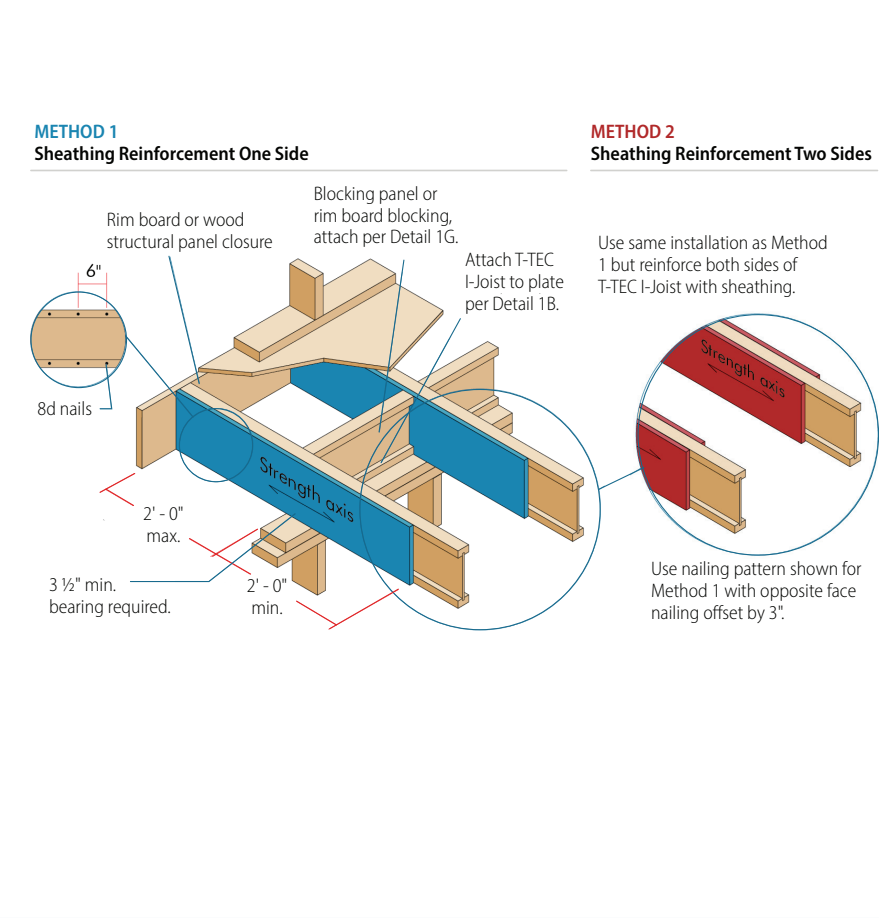
LUMBER CANTILEVER DETAIL FOR BALCONIES



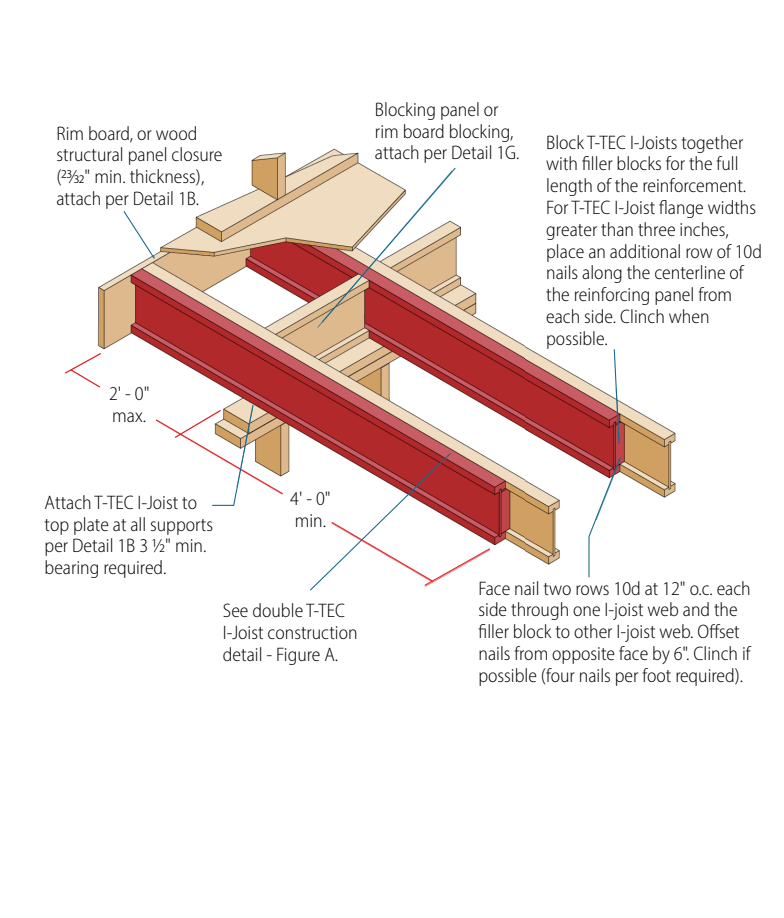
CANTILEVER DETAIL FOR BALCONIES



LUMBER CANTILEVER DETAIL FOR BALCONIES



ALTERNATE METHOD 2 - DOUBLE T-TEC I-JOIST



WEB STIFFENER REQUIREMENTS

A web stiffener is a wood block that is used to reinforce the web of an T-TEC I-Joist at locations where:

- The webs of the T-TEC I-Joists are in jeopardy of buckling out of plane. This results in lower buckling capacities for deeper I-Joist depths.
- The webs of the T-TEC I-Joists are in jeopardy of "kinking" through the T-TEC I-Joist flanges. This can occur at any T-TEC I-Joist depth when the design reaction loads exceed a specific level.
- The T-TEC I-Joist is supported in a hanger and the sides of the hanger do not extend up to the top flange. With the top flange unsupported by the hanger sides, the joist may deflect laterally, putting a twist in the flange of the joist. The web stiffener supports the T-TEC I-Joist along a vertical axis as designed. (In this application, the web stiffener acts very much like a backer block.)

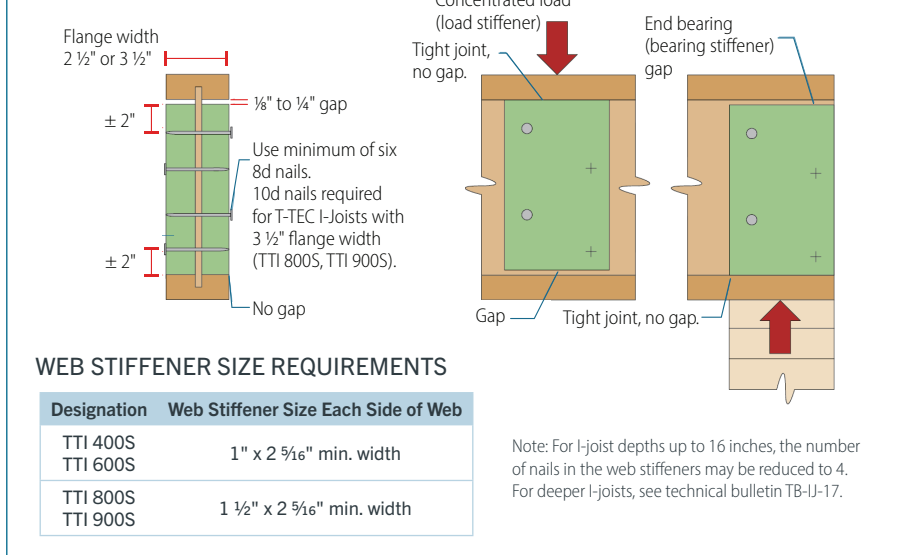
There are two kinds of web stiffeners: bearing stiffeners and load stiffeners. They are differentiated by the applied load and location of the gap between the slightly undersized stiffener and the top or bottom flange.

Bearing stiffeners are located at the reactions, both interior and exterior, when required. T-TEC I-Joists do not need bearing stiffeners at any support when subjected to normal residential form loads and installed in accordance with the allowable spans.

Load stiffeners are located between supports where significant point loads are applied to the top flange of an T-TEC I-Joist.

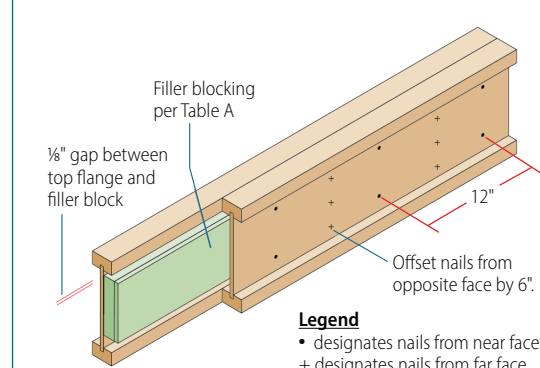
Web stiffener blocks may be comprised of lumber, rim board, or wood structural panels. The minimum grade of wood structural panels is Rated Sheathing; minimum lumber grade

WEB STIFFENER REQUIREMENTS



DOUBLE JOIST CONSTRUCTION

FIGURE A: DOUBLE JOIST CONSTRUCTION



Notes:

- Support back of T-TEC I-Joist web during nailing to prevent damage to web / flange connection.
- Nail joists together with three rows of 10d nails at 12" o.c. (clinched when possible) on each side of the double T-TEC I-Joist. Total of six nails per foot required. If nails can be clinched, only three nails per foot are required. For I-joist depths up to 16 inches, rows of nails may be reduced to two rows, total of four nails per foot (two nails per foot if clinched).
- Filler block is required between joists for full length of span.
- Leave a 1/8" gap between top of filler block and bottom of top T-TEC I-Joist flange.
- Where discrete BACKER blocks are used for side-applied point loads (see detail 1H), and the remaining length of a 2-ply T-TEC I-Joist girder is top-loaded, the FILLER block need not be continuous. Install minimum 3 1/2" long FILLER blocks at maximum 4' o.c. spacing using a minimum of six nails from each face.

FILLER BLOCK REQUIREMENTS FOR DOUBLE JOIST CONSTRUCTION

Flange Width	Joist Series	Joist Depth	Filler Depth	Filler Thickness
2 1/2"	TTI 400S TTI 600S	9 1/2"	6"	2 1/8"
		11 7/8"	8"	
		14"	10"	
		16"	12"	
3 1/2"	TTI 800S TTI 900S	9 1/2"	6"	3"
		11 7/8"	8"	
		14"	10"	
		16"	12"	

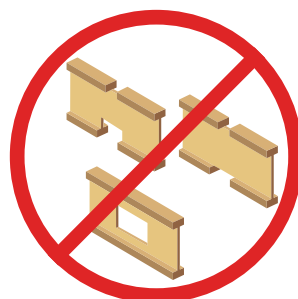
WEB HOLE GUIDELINES

ALLOWABLE WEB HOLE SIZES AND LOCATIONS (U.S. ASD)

40 psf unfactored Live Load, 15 psf unfactored Dead Load (1 3/4" end bearings, 3 1/2" interior without bearing stiffeners).

Minimum distance from inside face of any support to center of web hole (simple or multi-span).

Residential (40L + 15D) - Single & Multiple Spans	Joist Depth (in)	Series	SAF	Round Hole Diameter (inches)													
				2	3	4	5	6	6 1/4	7	8	8 3/8	9	10	10 3/4	11	
9.5	TTI400S	14-0"	0-7	1-7	2-10	4-1	5-6	5-10									
		TTI600S	15-4"	0-7	1-4	2-9	4-2	5-9	6-2								
		TTI800S	16-9"	1-2	2-7	4-1	5-7	7-3	7-8								
		TTI900S	17-2"	0-7	1-11	3-6	5-3	7-1	7-7								
11.875	TTI400S	15-11"	0-7	0-8	1-3	2-5	3-8	4-0	5-0	6-4	7-3						
		TTI600S	17-11"	0-7	0-9	2-0	3-2	4-7	4-11	6-0	7-6	8-6					
		TTI800S	19-11"	0-9	2-0	3-5	4-8	6-1	6-5	7-6	9-1						
		TTI900S	20-4"	0-7	0-10	2-5	4-0	5-7	6-0	7-4	9-2	10-5					
14	TTI400S	17-6"	0-7	0-8	0-8	0-11	2-1	2-5	3-4	4-7	5-5	5-11	7-4	8-6			
		TTI600S	17-11"	0-7	0-8	0-8	1-2	2-4	2-8	3-7	4-10	5-8	6-3	7-8	8-10		
		TTI800S	22-3"	0-7	2-3	2-3	3-6	4-9	5-1	6-2	7-7	8-6	9-0	10-7			
		TTI900S	23-1"	0-7	1-6	1-6	2-11	4-4	4-9	5-11	7-6	8-7	9-2	11-0			
16	TTI400S	17-11"	0-7	0-8	0-8	0-9	0-9	0-10	1-2	2-4	3-2	3-7	4-10	5-10	6-3		
		TTI600S	17-11"	0-7	0-8	0-8	0-9	0-9	0-10	1-2	2-4	3-2	3-7	4-10	5-11	6-3	
		TTI800S	22-3"	0-7	0-8	0-8	1-2	2-5	2-8	3-8	4-11	5-9	6-3	7-8	8-9	9-2	
		TTI900S	24-1"	0-7	0-8	0-8	0-9	2-0	2-5	3-5	4-10	5-9	6-4	7-11	9-1	9-6	



Construction Notes:

- 1) Never drill, cut or notch the flange, or over-cut the web.
- 2) Holes in web should be cut with a sharp saw.
- 3) For rectangular holes, avoid over-cutting the corners, as this can cause unnecessary stress concentrations. Slightly rounding the corners is recommended. Starting the rectangular hole by drilling a 1-inch diameter hole in each of the four corners and then making the cuts between the holes is another good method to minimize damage to the I-joist.

Notes:

- 1) Table may be used for I-joist spacing 24 inches on center or less.
- 2) Hole location distance is measured from inside face of supports to center of hole.
- 3) Distances in this chart are based on uniformly loaded joists.
- 4) Joists with web hole location and/or sizes that fall outside of the scope of this table must be analyzed based on the actual hole size, joist spacing, span and loading condition. The I-joist shear capacity at the location of the circular web hole is calculated using the following equation:

$$V_{(round\ hole)} = \text{Published Shear Value} \times [(Joist\ Depth - Hole\ Diameter) / Joist\ Depth].$$

SAF = Span adjustment factor, used as defined below

OPTIONAL:

This table is based on I-joists being used at a span = SAF. If the I-joists are placed at less than SAF, the maximum distance from the centerline of the hole to the face of any support (D), as given above may be reduced as follows:

$$D_{reduced} = L_{actual} / SAF \times D$$

Where $D_{reduced}$ = Distance from the inside face of any support to center of hole, reduced for less than maximum span applications (ft). The reduced distance must not be less than 6 inches from the face of support to edge of hole.

L_{actual} = The actual measured span distance between the inside faces of supports (ft).

SAF = Span Adjustment Factor given above.

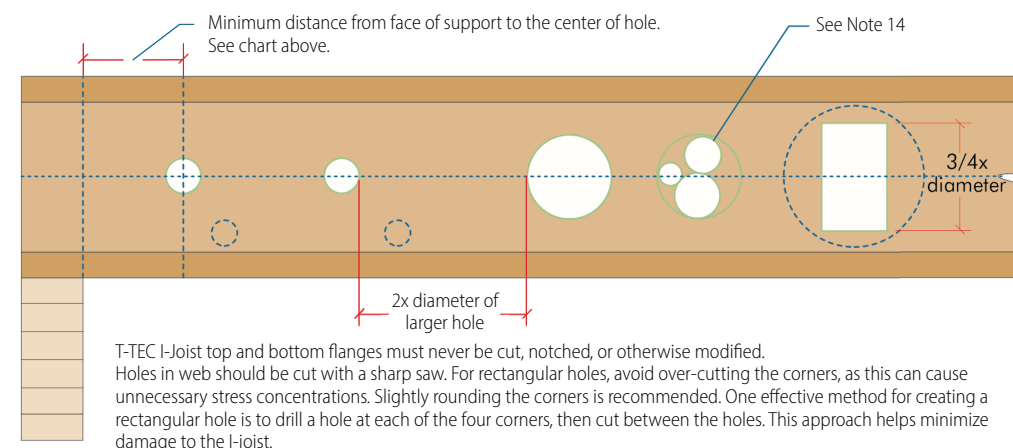
D = The minimum distance from the inside face of any support to center of hole given above.

The table is only applicable to cases where $L_{actual} \leq SAF$.

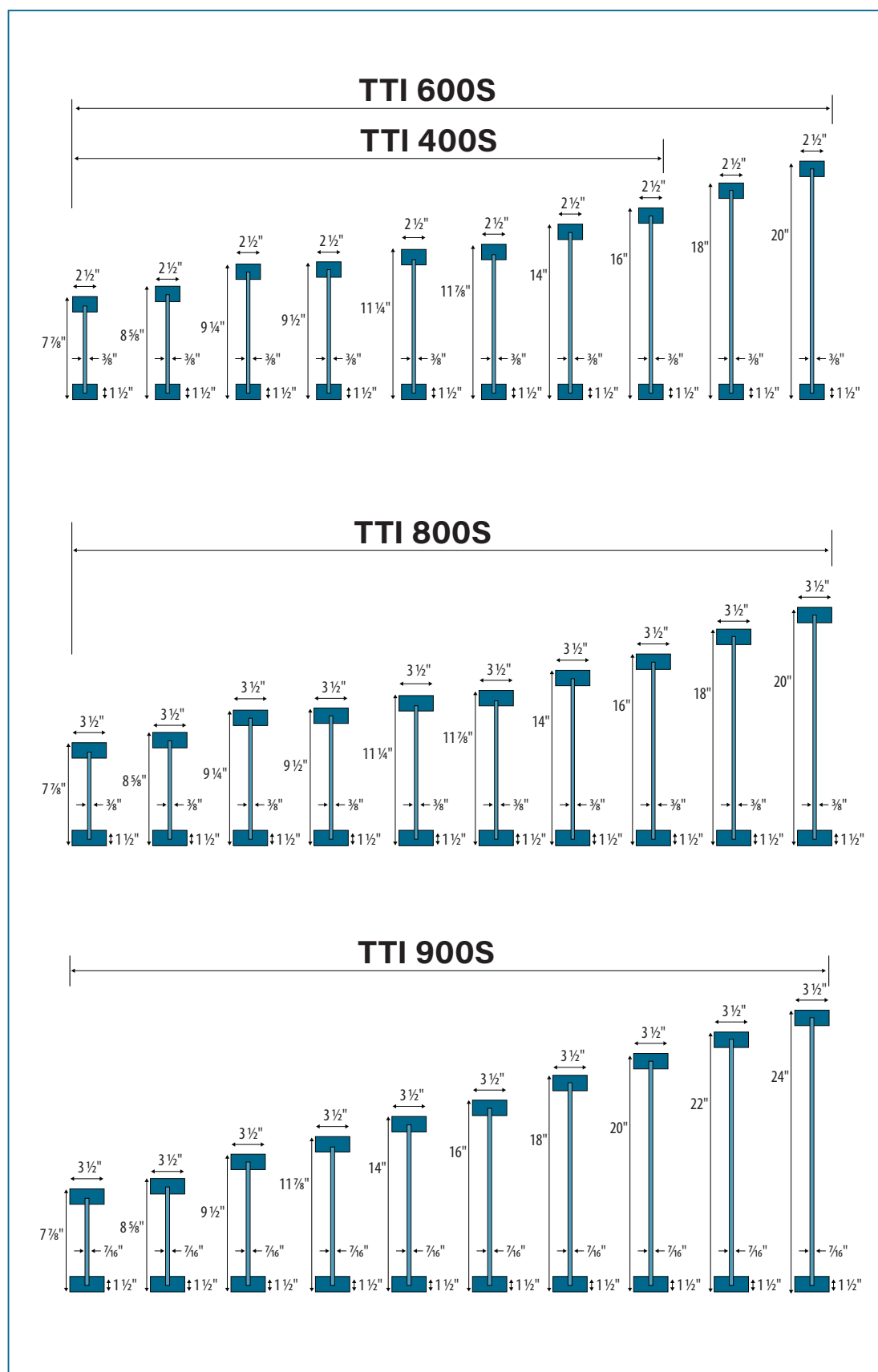
- 5) I-joist top and bottom flanges must NEVER be cut, notched, or otherwise modified.
- 6) Whenever possible, field-cut holes should be centered in the middle of the web.
- 7) The maximum size hole that can be cut into an I-joist web shall equal the clear distance between the flanges of the I-joist minus 1/4 inch. A minimum of 1/8 inch should be maintained between the top or bottom of the hole and the adjacent I-joist flange.
- 8) The sides of square holes or longest sides of rectangular holes should not exceed three fourths of the diameter of the maximum round hole permitted at the location.
- 9) When more than one hole is necessary, the distance between adjacent hole edges shall be at least twice the diameter of the largest round hole or twice the size of the largest square hole (or twice the length of the longest side of the longest rectangular hole) and each hole must be sized and located in compliance with the requirements of the table above.
- 10) A notch is not considered a hole, and may be utilized anywhere it occurs and may be ignored for purposes of calculating minimum distances between holes.

- 11) 1 1/2-inch diameter round holes shall be permitted anywhere in a cantilevered section of an T-TEC I-Joist. Holes of greater size may be permitted subject to verification.
- 12) A single round web hole 1 1/2-inch diameter may be located anywhere in the web provided that it meets the requirements of note 9 above. Several web holes of 1 1/2-inch diameter in a horizontal row are permitted if they meet the requirements of note 9 and cover a length of 24 inches or less. Multiple web hole openings 1 1/2-inch in diameter covering a length of greater than 24 inches may be allowed subject to verification.
- 13) All holes shall be cut in a workman-like manner in accordance with the restrictions listed above and as illustrated in figure above. For rectangular holes, avoid over-cutting corners. It is recommended to start by drilling one-inch diameter holes at the four corners, then making cuts between the holes to minimize damage to the joist.
- 14) A group of round holes at approximately the same location shall be permitted if they meet the requirements for a single round hole circumscribed around them.
- 15) For joists with more than one span, use the longest span to determine hole location in either span.
- 16) Refer to T-TEC EWP Inc. design software for other hole sizes and locations.

TYPICAL WEB HOLES



T-TEC I-JOIST SERIES



SUGGESTED TOOLS FOR INSTALLATION

Tools and personal protective equipment (PPE) are the responsibility of the framing contractor. The tools suggested are:

- Compressor
- Pneumatic Air Nailer
- Hammer
- Circular saw
- Hearing protection and other PPE as mandated by AHJ

STORAGE AND HANDLING

INTRODUCTION

Proper storage and handling of engineered wood products (EWP) including T-TEC LSL, T-TEC LVL, T-TEC I-Joists, Tolko LSL Industrials and Tolko LVL Industrials is required to protect the products during distribution and at the job-site. APA – The Engineered Wood Association recommends the following storage and handling practices for EWP products. For full details on proper storage and handling, refer to *APA Technical Note: Proper Storage and Handling of I-Joists and LVL, Form E705* available at www.apawood.org.

SAFE HANDLING DURING DISTRIBUTION

1. Bundle wrap can be slippery. Avoid walking on wrapped bundles. Stacks of product may be unstable or slippery, especially when wet. Avoid walking on the material.
2. Follow good forklift safety procedures when handling EWP at the yard.
3. Store longest material lowest to the ground.
4. When handling with a crane, pick up the load using a spreader if necessary to minimize handling stresses.
5. Post and follow load limits on storage racks.

STORAGE DURING DISTRIBUTION

1. Keep wrapped to protect from weather.
2. Use stickers to separate bundles.
3. Use stickers every 8 feet and maintain vertical alignment of the stickers.
4. Do not store EWP in direct contact with the ground.
5. For optimal moisture protection, keep at least 12 inches up from the ground.
6. To protect from dirt and weather, delay unwrapping the bundles until the time of the installation or cut-up for delivery.
7. Take care to avoid forklift damage. If the ground is unlevel in the storage area, reduce forklift speed to avoid “bouncing” the load.
8. When handling with a crane, pick up the load using a spreader if necessary to minimize handling stresses.
9. Maintain stack height within safe limits.
10. Do not stack other material on top of EWP.

PROPER HANDLING AT THE JOB-SITE

1. Do not drop the product off the delivery truck. Best practice is to use a forklift or boom.
2. Store on level, well-drained area.
3. Keep on stickers spaced every 8’ and at least every 6” off the ground at the job-site.
4. Keep material covered to protect from weather.
5. Do not stack other material on top of the product.
6. Never use or try to repair damaged products. If defective material is discovered prior to or during installation, cease installation and contact the supplier.

MOISTURE EFFECTS

T-TEC Engineered Wood products are manufactured under carefully controlled conditions that assure they are dry. Moisture content can be affected by humidity, exposure to wetting and drying conditions. While T-TEC Engineered Wood products are engineered to withstand normal exposure, excessive exposure to moisture may lead to dimensional change.

If moisture is present, mold, mildew and wood decay fungi may grow on any engineered wood products, thus it is important to properly store EWP to control exposure to moisture. Moisture increase is expected under normal construction situations and does not adversely affect the performance of the products if good building practices are followed to minimize exposure and to provide proper conditions for the products to re-equilibrate to dry conditions.

Reference: *APA Technical Note: Proper Storage and Handling of I-Joists and LVL, Form E705* available at www.apawood.org.