MTC SOLUTIONS

Version 2.0

Rigging Design Guide

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Mass Timber Hardware Specialists

At MTC Solutions, our core focus is to supply structural hardware for modern mass timber applications in commercial, industrial, and residential projects. Our pride lies in collaborating with leading industry experts to offer design solutions and tools for code-compliant, sustainable buildings, continuously pushing the boundaries of the North American construction industry.

Our in-house team of mass timber specialists support professionals in designing customized connections that cater to the specific requirements of each project, resulting in truly innovative and cost-efficient solutions. With industry-recognized expertise and tested & proven solutions, we stand at the forefront of the industry, driving progress and innovation in mass timber construction.

Expertise

We provide our customers with the knowledge and tools necessary to construct cutting-edge, code-compliant mass timber projects while pushing the boundaries of the North American construction industry.

Commitment

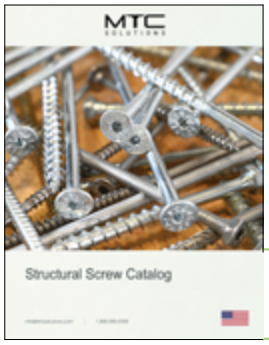
We are dedicated to making your project a success, offering support from design and installation assistance to fast and precise delivery of high-quality products.

Products Tailored for North America

We partner with leading research facilities across North America to ensure that our products are tested and customized to meet the unique needs of the market, including seismic considerations and solutions for large post-and-beam structures in various climates.

Find Your Connection Solution

MTC Solutions provides the right tools to design code-compliant buildings, educating the mass timber industry on connection solutions.



Structural Screw Catalog

+

Structural Screw Connection Design Guide

Structural Fasteners

Accessories

Beam Hangers Design Guide

Beam Hangers

Connector Design Guide

Connectors

Rigging Design Guide

Rigging Devices

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Fall Arrest

WHO ARE WE?

YOUR MASS TIMBER HARDWARE SUPPLIER

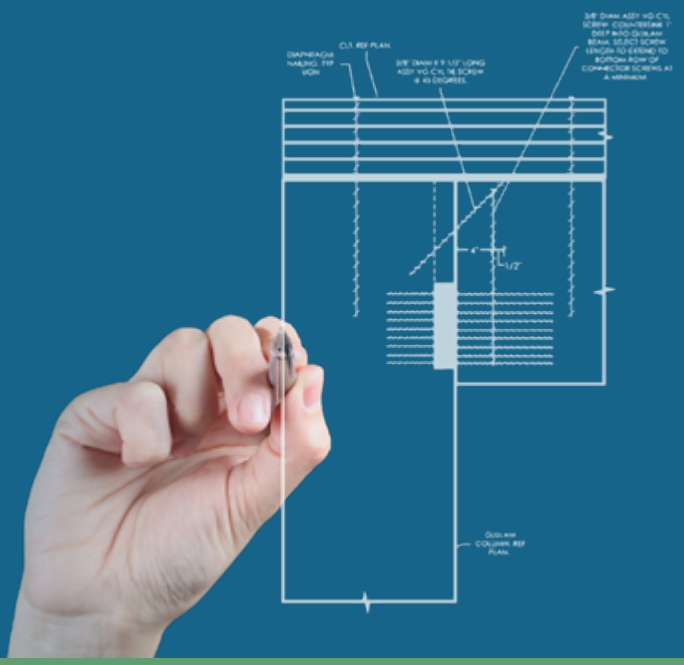
Rely on our distribution team to deliver your North American projects with speed and accuracy.

LEADING WITH INNOVATION & RESEARCH

We are leading the mass timber industry with cutting-edge connection solutions and through partnerships with renowned research facilities.

WE MAKE YOU THE EXPERT

Learn about the right solutions for your projects and mass timber connections with our technical resources & support team!



CONNECTION DESIGN SUPPORT

Reach out to our technical team for design support, from early design stages to ongoing iterative changes. We help you find the most efficient connection solutions.

MANUFACTURERS' HELP DESK

Use our comprehensive & practical resources to find the most cost-effective solutions for your structural elements.

TESTED & PROVEN SOLUTIONS

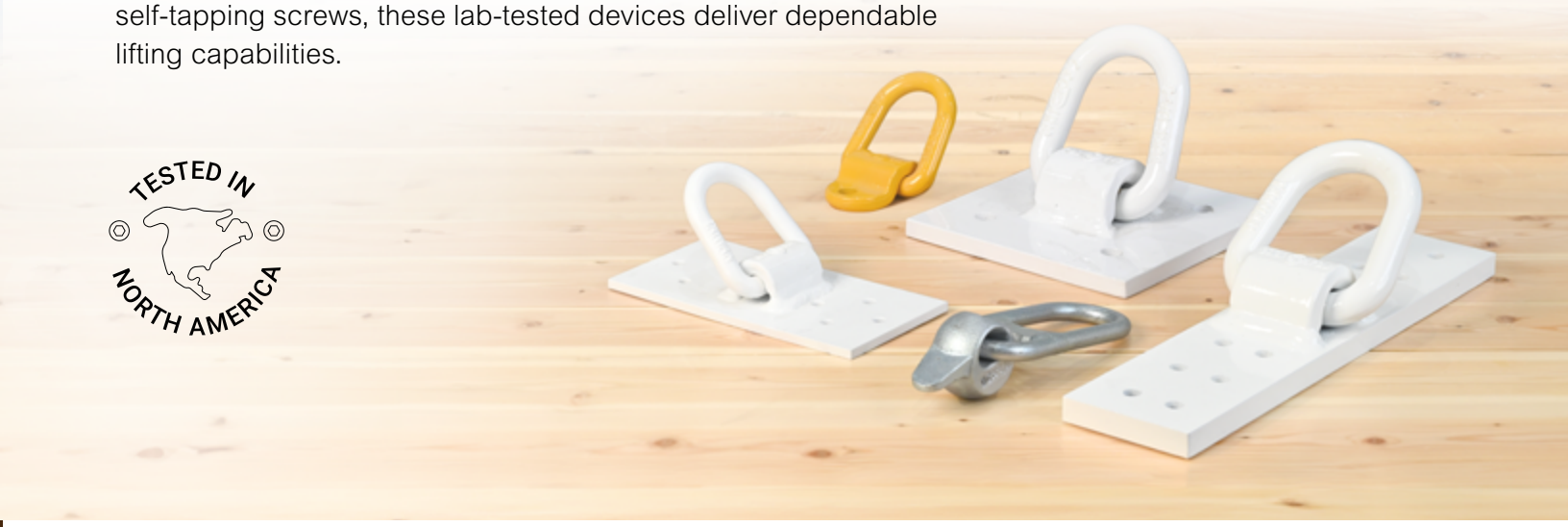
Count on MTC Solutions' 10+ years of expertise, providing tested & proven, ICC-ES-certified solutions, along with comprehensive support and resources.

Brock Commons

Vancouver, British Columbia

MTC Rigging Systems

MTC Solutions Rigging Systems offer unique rigging solutions for lifting timber elements varying in weight, size, and material. Designed to be installed with top-quality, code-compliant ASSY self-tapping screws, these lab-tested devices deliver dependable lifting capabilities.



ASSY Fasteners

Installed with our lab-tested, ICC-ES-certified fasteners for reliable lifting application

Fast Installation

Self-tapping screws make these systems some of the most efficient on the market

Versatile Applications

Compatible with many mass timber applications, from the thinnest beams to the heaviest panels

High Capacities

A single anchor can lift up to 10,990 lb. [48.89 kN]

COMPLIANCE

OSHA

ASME

Infrastructure Health & Safety Association

Rigging safety regulations covering the majority of the Canadian population*

*Refer to the General Notes to the Designer and Installer section for more details. For further questions or guidance, contact our Technical Support Team.

MTC Recommended Rigging Planning Process

Calculate Force Per Anchor

Determine the force per anchor (F) based on the weight of the element and rigging conditions.

Select Rigging System

Choose the optimal rigging solution using the table below. The systems recommended for each type of mass timber element are highlighted in green, along with their maximum capacities per anchor at a sling angle (β) of 60°.


Transport Anchor


Mini Yoke


Yoke 1T

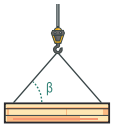

Yoke 5T


Yoke XL

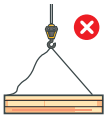
A: Light-Frame Panels (Rigging)					
Structural Insulated Panels		**90 lb.** *[0.40 kN]*			
Prefabricated I-Joist Floors		**480 lb.** *[2.14 kN]*			
Prefabricated Stud Walls			**790 lb.** *[3.51 kN]*		
B: Mass Timber Floor and Roof Panels (Rigging)					
Mass Timber Panels	**1,200 lb.** *[5.34 kN]*		**1,870 lb.** *[8.32 kN]*	**4,220 lb.** *[18.77 kN]*	**9,340 lb.** *[41.55 kN]*
C: Mass Timber Wall Panels (Tilting)					
Panel Edges					**1,200 lb.** *[5.34 kN]*
Panel Faces					**3,500 lb.** *[13.79 kN]*
D: Glulam Beams and Logs (Rigging)					
Glulam Beams	**1,200 lb.** *[5.34 kN]*		**1,870 lb.** *[8.32 kN]*		**9,340 lb.** *[41.55 kN]*
Logs	**1,200 lb.** *[5.34 kN]*				

Installation

Install the rigging system.



Check
Sling Angle (β)

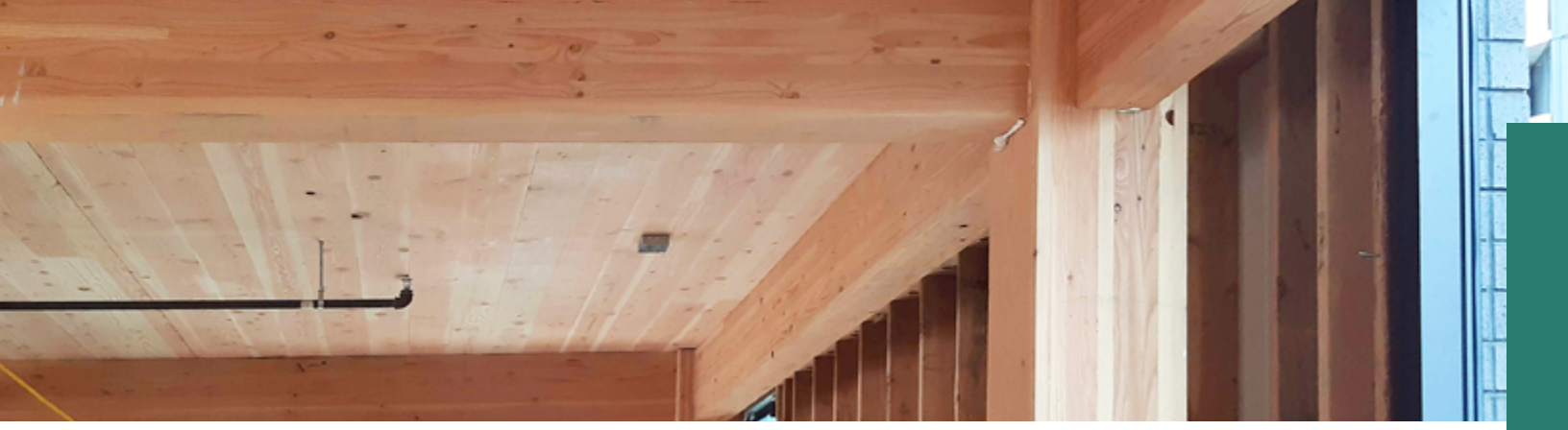


Check
Load Spreading

Check
Anchor Condition

Notes:

1. The basic procedures outlined above contain the steps recommended for the licensed design professional to prepare a rigging plan.
2. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. These values are intended as a general selection tool and should not be used for design purposes.
3. The design values presented in this guide are intended to be used with panel products in conformance to ANSI/APA PRG 320 and are not intended for use with products such as nail- or dowel-laminated timber.



General Notes to the Designer and Installer

All rigging elements shall be approved by a licensed design professional. All rigging shall be performed by qualified personnel only. It is the responsibility of the designated licensed rigging professional to ensure a safe work environment and verify the condition of all equipment. All suggestions and details shown in this guide are general guidelines and cannot be assumed to be valid for all construction requirements and specific site conditions.

Safety & Regulatory Compliance

All listed capacities for our rigging hardware (anchor attachment systems) include a factor of safety of 5.0 in compliance with various standards in the United States and Canada, including:

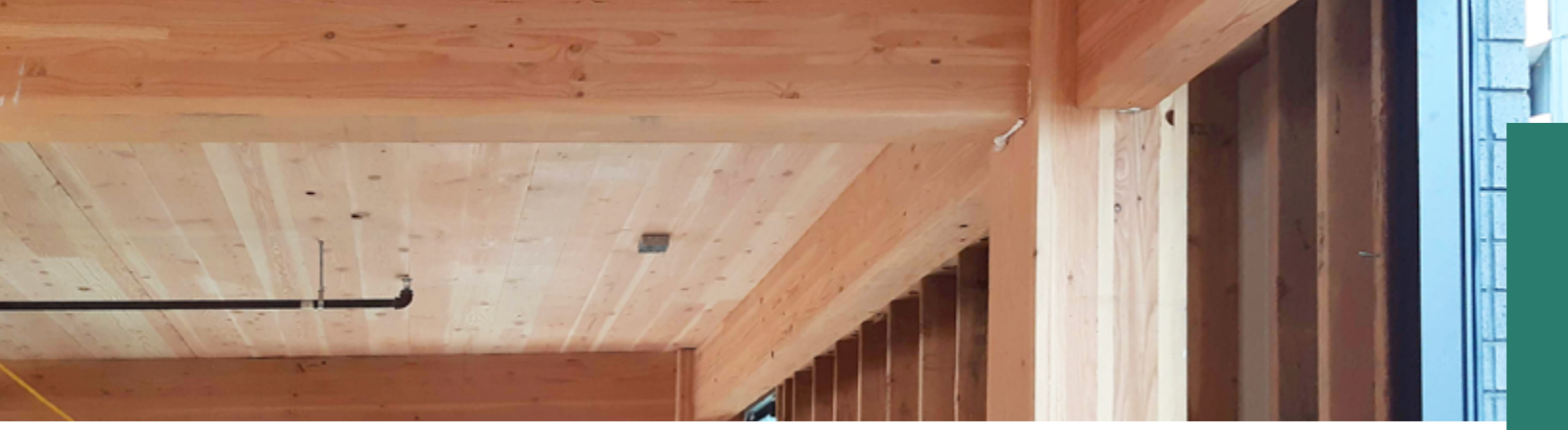
- Safety and Health Regulations for Construction, Hoisting and Rigging (United States Occupational Safety and Health Administration (OSHA))
- Ontario Regulation 213/91: Construction Projects under the Occupational Health and Safety Act (Ontario)
- Hoisting and Rigging Safety Manual (Infrastructure Health and Safety Association (IHSA))
- Safety Code for the construction industry under the Act Respecting Occupational Health and Safety (Quebec)
- Occupational Health and Safety Regulation under the Workers Compensation Act (British Columbia)
- Occupational Health and Safety Code (Alberta)

Achieving the listed capacities and compliance with these regulatory and safety standards assumes that the rigging hardware is in acceptable condition (see acceptance criteria as described in the Check Anchor Condition section) and that the rigging solution has been designed and approved for use by a qualified and appropriately licensed or certified building design professional or professional engineer ("Designer"). Do not use our rigging hardware if these requirements are not met.

Other regulatory bodies and Authorities Having Jurisdiction may mandate additional specific requirements for safely rigging elements on-site. These requirements and provisions must be followed to ensure compliance. For guidance or a review of compliance with additional requirements on a project-specific basis, contact our Technical Support Team.

Rigging Capacity

1. Listed reference rigging capacity per anchor (Z) achieve safety and regulatory compliance for hoisting and rigging products, as described on Page 11.
2. Listed reference rigging capacity per anchor (Z) are only valid with their accompanying ASSY screws.
3. Listed reference rigging capacity per anchor (Z) shall be factored with appropriate adjustment factors, as described in the Recommended Design Procedures section.
4. Listed reference rigging capacity per anchor (Z) consider the capacity of the screws and anchor device.
5. The term "anchor" or "anchoring device" refers to a system comprising both the rigging device and the screws as a system. Any slings, hooks, or other components are outside the scope of this document.
6. The anchoring devices specified in this document are intended for use with continuously bonded materials (i.e., not fastened with nails or other dowel connectors). To ensure full connection capacity when lifting CLT panels, fasteners must penetrate as many panel plies as possible, with a minimum of three plies penetrated. See Tables 3.4 and 3.8 for suggested screw lengths for use with CLT panels of different thicknesses.
7. In all rigging applications, the minimum penetration depth with respect to wood panel thickness must be met.
8. When rigging deep members, such as deep glulam beams, the splitting resistance perpendicular to the grain of the element must be considered. Reinforcement of the wood fiber may be necessary to prevent damage during lifting.
9. A compensation system, such as a load spreader, should be used for lifts using more than two anchors. Otherwise, the capacity of the anchors shall be adjusted using the appropriate load spreader reduction factor (R_{LS}) or other appropriate engineering judgment.
10. The resultant forces in each sling must be calculated separately and must not exceed the reference rigging capacity per anchor (Z) of the anchoring device.
11. The sling angle (β) must be equal to or greater than 60°, measured between the sling and the element surface. Otherwise, the capacity of the anchors shall be adjusted with the appropriate anchor resistance reduction factor (R_{AR}) given in Table 2.3.
12. The anchor resistance reduction factor (R_{AR}) accounts for the reduction in the capacity of the fasteners in the anchor at sling angles lower than 60°.
13. The designated licensed rigging professional is responsible for ensuring that the lifting operations occur within the working limits of the slings.



Anchor Placement

1. All requirements for anchor end and edge distances, as well as material thickness, are minimum requirements and must be followed during installation.
2. To ensure stable rigging with equal load distribution, anchors must be positioned in consideration with the center of gravity of the element. Otherwise, additional moment equilibrium calculations are required to determine load distribution among the anchors.
3. To reduce the risk of eccentric loading of fasteners, anchors should be installed such that the load and sling are aligned and that the anchor may freely rotate.
4. Installers should center fasteners in holes to prevent thread contact with the anchor plate.

Rigging Condition Requirements

1. To ensure safety and intended capacity, fasteners must not be reused for element rigging. Screws may sustain damage during removal, reinsertion, or repositioning, potentially leading to a reduced anchor capacity.
2. Ensure rigging hardware inspection guidelines are followed and completed by a trained rigging specialist per regulatory body requirements. Wear often occurs around the fastener holes. If damage is found on the anchors, they must not be used and must be taken out of service immediately.
3. Before each lift, check for proper sling attachment.
4. Ensure the rigging system is located over the element's center of gravity prior to lifting.
5. No person or unsecured object should be present on the element during rigging (no live load).
6. Suspended loads must be securely attached and properly balanced before they are set in motion.
7. The load must always be kept under control. The use of taglines is recommended to prevent uncontrolled motion.
8. Loads must be safely landed and properly blocked before the element is unhooked and unslung.
9. No lifting over persons at any time.
10. Caution should be exercised during installation to avoid over-torquing fasteners. Do not use impact drills.

Brock Commons

Vancouver, British Columbia

Recommended Design Procedure

This guide provides designers with an overview of rigging options using products from MTC Solutions. The element weight can be adjusted based on site conditions, if necessary. The guidelines below outline suggested adjustment factors.

Calculate Demand

It is essential to determine the total force per anchor (F) for a rigged element. Its weight must be accounted for in this calculation by incorporating a dynamic acceleration factor and an optional factor of safety for each rigging scenario. In all cases, F must be specified and approved by a licensed design professional.

$$F = \frac{p \cdot f \cdot K_{os} \cdot S_a}{n \cdot R_{LS}} \qquad \textbf{(eq. 1)}$$

F Total force per anchor

p Unfactored weight of the rigged element [lb.] (provided in shop drawings or manufacturer's specifications)

f Dynamic acceleration factor, shown in Table 2.0

K_{os} Optional safety adjustment factor, shown in Table 2.1

S_a Sling angle force adjustment factor, shown in Table 2.2

n Number of anchors used

R_{LS} Load spreader adjustment factor:

- For n = 2 **1.0**
- For n = 4, with an adequate compensation system, such as a load spreader **1.0**
- For n = 4, without an adequate compensation system, such as a load spreader **0.5**

The procedures and equations apply to systems with n ≤ 4.

Table 2.0 - Dynamic Acceleration Factor (f)

	Dynamic Acceleration Factor (f)
Fixed cranes	1.3
Mobile cranes	1.4
Bridge cranes	1.6
Rigging and moving on flat terrains	2.5
Rigging and moving on rough terrains	4.0

Notes:

1. Source: Canadian CLT Handbook, 2019 Edition, FPInnovations.

Table 2.1 - Proposed Optional Safety Adjustment Factor (K_{os})

	Optional Safety Adjustment Factor (K_{os})
Rig mat rigging	0.8
Open space rigging	1.0
Tight space rigging	1.1

The tabulated capacities account for the forces applied on the anchors and are calibrated for an assumed sling angle (β) of 60°. β is the acute angle formed between the sling and the element surface. The working limits of common sling configurations can be estimated using the simple geometry of the rigged element. The value of the adjustment factor associated with β (S_a) decreases as β increases, as is shown in the following table.

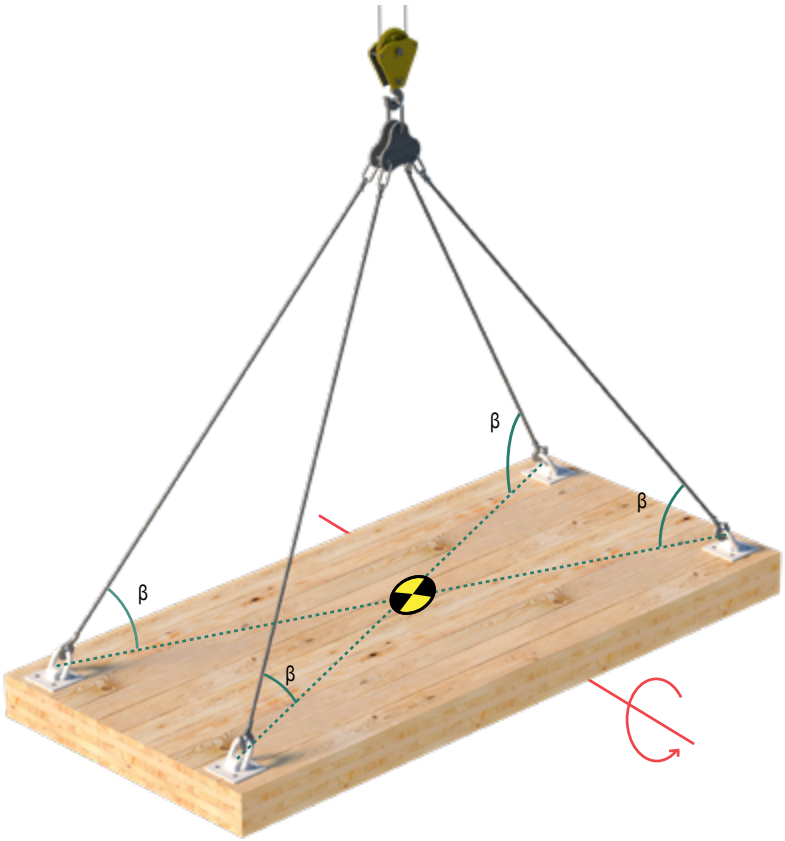
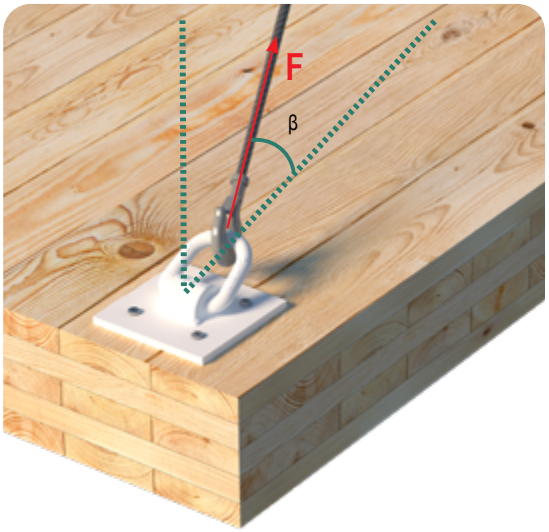


Table 2.2 - Sling Angle Force Adjustment Factor (S_a)

Sling Angle (β)	Sling Angle Force Adjustment Factor (S_a)
90°	0.87
75°	0.90
60°	1.00
45°	1.24
30°	1.74



Determine Adjusted Anchor Capacity (Z')

$$Z' = Z \cdot R_{AR} \cdot R_D \qquad \textbf{(eq. 2)}$$

Z' Adjusted anchor capacity

Z Reference rigging capacity per anchor (provided in the design tables)

R_{AR} Anchor resistance reduction factor:

- For sling angles (β) ≥ 60°, R_{AR} = 1.0
- For β < 60°, see the table below:

Table 2.3 - Anchor Resistance Reduction Factor for β < 60°

β	50°	40°	30°	20°	10°
R_{AR}	0.80	0.65	0.55	0.45	0.35

Note:
1. Not applicable for the Transport Anchor

R_D Load duration reduction factor:

- For load durations < 10 min **1.0**
- For load durations > 10 min and < 1 day **0.78**

The adjusted anchor capacity (Z') calculated using eq. 2 must be greater than the total force per anchor (F) calculated using eq. 1: Z' > F.

First United Bank

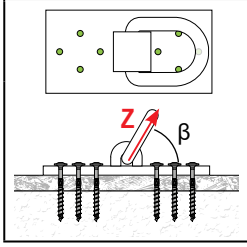
Fredericksburg, Texas

Select Rigging System

Light-Frame Panel Rigging

Structural Insulated Roof Panels Using Yoke Systems

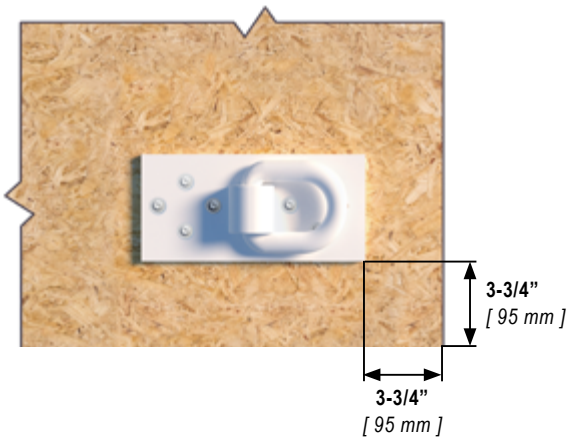
Table 3.0 - Reference Rigging Capacity (Z) of the Mini Yoke for Rigging SIP Flat Panels

Rigging Device	Specific Gravity [G]	Minimum OSB Thickness [t_{OSB}]		Fastener Option			Reference Rigging Capacity [Z]	
		in.	*[mm]*		in.	*[mm]*	lb.	*[kN]*
Mini Yoke | 8 Screws 	≥ 0.42	**0.43**	*[11]*	SK	**1/4 × 2**	*[6 × 50]*	**90**	*[0.40]*
	≥ 0.49							

Notes:

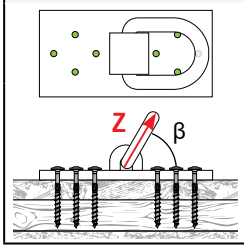
1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Smaller sling angles require further capacity reductions as outlined in the Recommended Design Procedure section.
5. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
6. ASSY screws are designed for single use only. New screws must be used for each lift.

End and Edge Distance Requirements



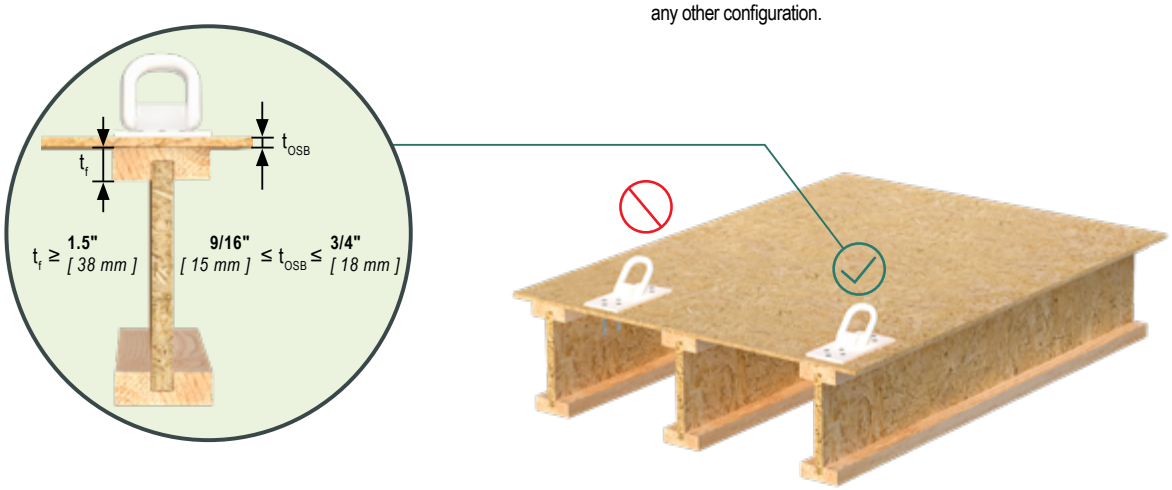
Prefabricated I-Joist Floor Panel Rigging Using Yoke Systems

Table 3.1 - Reference Rigging Capacity (Z) of the Mini Yoke for Rigging Prefabricated I-Joist Floor Panels

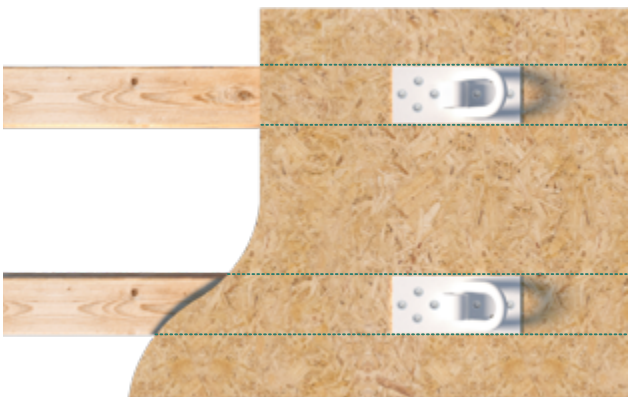
Rigging Device	Specific Gravity [G]	Minimum Flange Thickness		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
Mini Yoke | 8 Screws 	≥ 0.42	**1.5**	[38]	SK	**1/4 × 2-3/8**	[6 × 60]	**480**	[2.14]
	≥ 0.49							

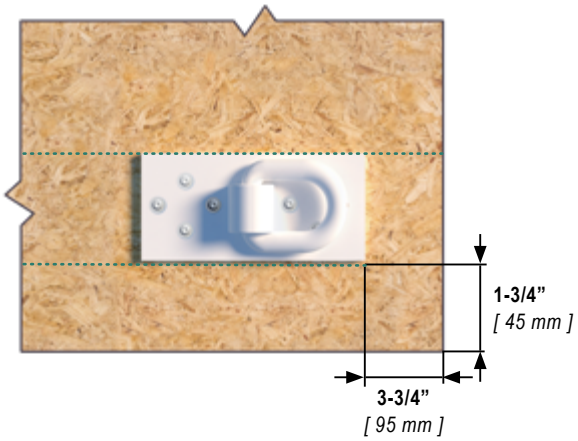
Notes:

1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Smaller sling angles require further capacity reductions as outlined in the Recommended Design Procedure section.
5. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
6. ASSY screws are designed for single use only. New screws must be used for each lift.
7. The Mini Yoke must be installed such that the screws penetrate both the panel and the I-joist flange properly. The capacity of the Mini Yoke cannot be guaranteed if installed in any other configuration.



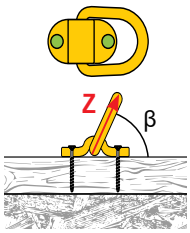
End and Edge Distance Requirements





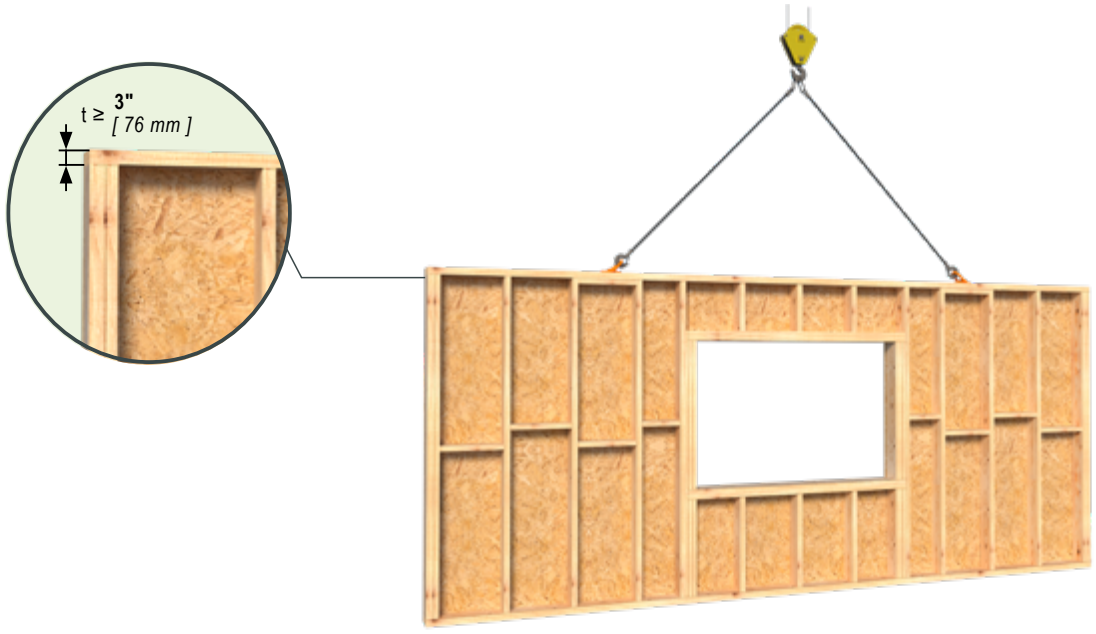
Prefabricated Stud Wall Rigging Using Yoke Systems

Table 3.2 - Reference Rigging Capacity (Z) of the Yoke 1T for Rigging Double Top Plate Stud Walls

Rigging Device	Specific Gravity [G]	Minimum Penetration Thickness [t]		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
Yoke 1T | 2 Screws 	≥ 0.42	**3**	[76]	VG CSK	**3/8 × 4**	[10 × 100]	**790**	[3.51]
	≥ 0.49							

Notes:

1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Smaller sling angles require further capacity reductions as outlined in the Recommended Design Procedure section.
5. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
6. ASSY screws are designed for single use only. New screws must be used for each lift.
7. Fasteners must be installed in minimum double 2x4 for listed minimum penetration thickness.
8. All sheathing, blocking, sill, and top plates should be nailed or screwed appropriately to ensure a continuous load path.
9. The capacity of this system is not guaranteed for tilting up panels.

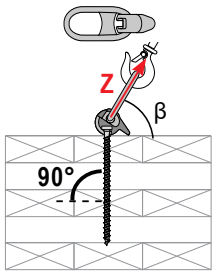
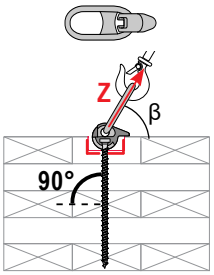


End and Edge Distance Requirements

Mass Timber Floor / Roof Panel Rigging

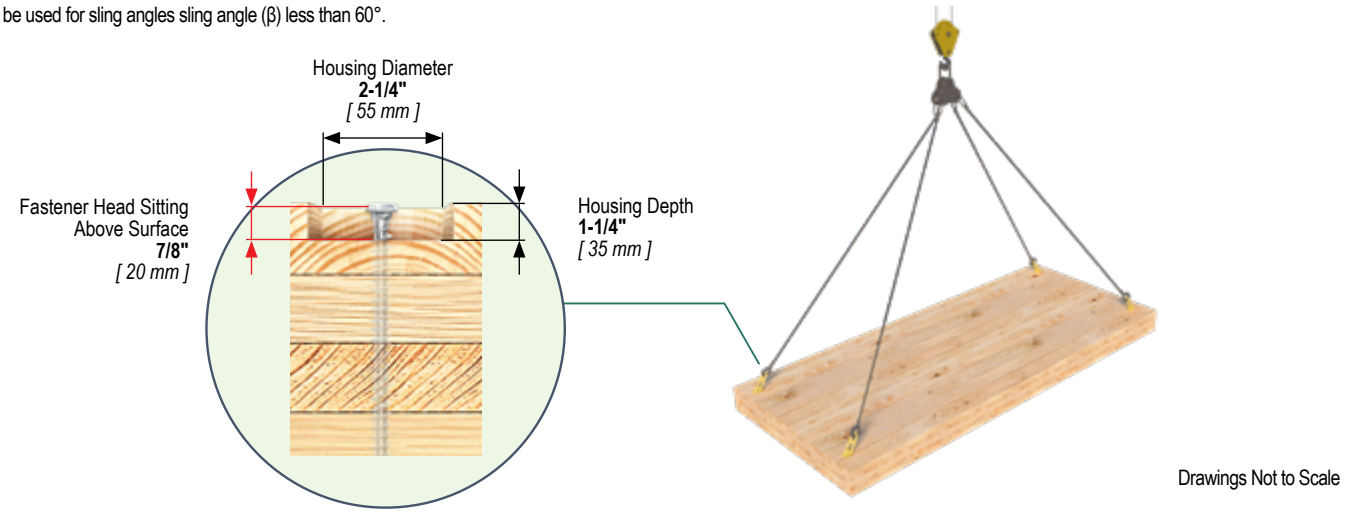
CLT Panel Rigging Using the Transport Anchor

Table 3.3 - Reference Rigging Capacity (Z) of the Transport Anchor (TA) for Rigging Flat CLT Panels

Rigging Device	Specific Gravity [G]	Minimum Panel Thickness		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
TA | 1 Screw 	≥ 0.42	**3-1/8**	[78]	Kombi LT	**1/2 × 3-1/8**	[12 × 80]	**350**	[1.56]
		4-3/4	[120]		**1/2 × 4-3/4**	[12 × 120]	**570**	[2.54]
		6-1/4	[160]		**1/2 × 6-1/4**	[12 × 160]	**700**	[3.11]
	≥ 0.49	**3-1/8**	[78]		**1/2 × 3-1/8**	[12 × 80]	**410**	[1.82]
		4-3/4	[120]		**1/2 × 4-3/4**	[12 × 120]	**650**	[2.89]
		6-1/4	[160]		**1/2 × 6-1/4**	[12 × 160]	**800**	[3.56]
Housed TA | 1 Screw 	≥ 0.42	**5-1/2**	[139]	Kombi LT	**1/2 × 4-3/4**	[12 × 120]	**700**	[3.11]
		7-1/8	[180]		**1/2 × 6-1/4**	[12 × 160]	**1,000**	[4.45]
	≥ 0.49	**5-1/2**	[139]		**1/2 × 4-3/4**	[12 × 120]	**800**	[3.56]
		7-1/8	[180]		**1/2 × 6-1/4**	[12 × 160]	**1,200**	[5.34]

Notes:

1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Transport anchors should not be used for sling angles sling angle (β) less than 60°.
5. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
6. ASSY screws are designed for single use only. New screws must be used for each lift.
7. The fastener head must sit 7/8" [20 mm] above the panel surface to ensure proper engagement of the anchor.
8. Proper housing dimensions must be used as described in the Installation Instructions section.
9. The Transport Anchor must be engaged and aligned with the axis angle of the lifting slings as described in the Installation Instructions section.



Drawings Not to Scale

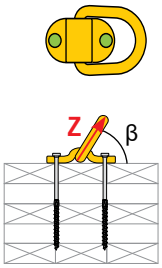
Table 3.4 - Suggested ASSY Screw Lengths for the Transport Anchor Based on the CLT Panel Thickness

CLT Panel			Transport Anchor					
PLY	Thickness		Prone			Housed		
	in.	[mm]	Fastener	in.	[mm]	Fastener	in.	[mm]
3 PLY	3-1/8	[78]	Kombi LT	1/2 × 3-1/8	[12 × 80]	N/A		
	3-3/8	[87]						
	3-1/2	[89]						
	4	[100]						
	4-1/8	[105]						
	4-3/4	[120]	Kombi LT	1/2 × 4-3/4	[12 × 120]			
5 PLY	4	[100]	Kombi LT	1/2 × 3-1/8	[12 × 80]	N/A		
	4-3/4	[120]	Kombi LT	1/2 × 4-3/4	[12 × 120]	Kombi	1/2 × 4	[12 × 100]
	5-1/8	[131]				Kombi LT	1/2 × 4-3/4	[12 × 120]
	5-1/2	[139]						
	5-5/8	[143]						
	6-1/4	[160]	Kombi LT	1/2 × 6-1/4	[12 × 160]	Kombi LT	1/2 × 6-1/4	[12 × 160]
	6-7/8	[175]						
	7-1/8	[180]						

Notes:
1. The fastener lengths are suggestions only and can be adjusted to fit specific site conditions and rigging needs.
2. The thread penetration length of the fasteners determines the capacity of a rigging system.

CLT Panel Rigging Using Yoke Systems

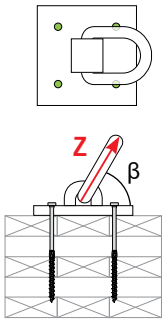
Table 3.5 - Reference Rigging Capacity (Z) of the Yoke 1T for Rigging Flat CLT Panels

Rigging Device	Specific Gravity [G]	Minimum Panel Thickness		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
Yoke 1T | 2 Screws 	≥ 0.42	**3-1/8**	[78]	Kombi LT	**1/2 × 3-1/8**	[12 × 80]	**1,070**	[4.76]
		4	[100]	Kombi	**1/2 × 4**	[12 × 100]	**1,010**	[4.49]
		4-3/4	[120]	Kombi LT	**1/2 × 4-3/4**	[12 ×120]	**1,320**	[5.87]
		6-1/4	[160]		**1/2 × 6-1/4**	[12 × 160]	**1,870**	[8.32]
	≥ 0.49	**3-1/8**	[78]	Kombi LT	**1/2 × 3-1/8**	[12 × 80]	**1,250**	[5.56]
		4	[100]	Kombi	**1/2 × 4**	[12 × 100]	**1,190**	[5.29]
		4-3/4	[120]	Kombi LT	**1/2 × 4-3/4**	[12 ×120]	**1,560**	[6.94]
		6-1/4	[160]		**1/2 × 6-1/4**	[12 × 160]	**1,870**	[8.32]

Notes:

1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Smaller sling angles require further capacity reductions as outlined in the Recommended Design Procedure section.
5. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
6. ASSY screws are designed for single use only. New screws must be used for each lift.

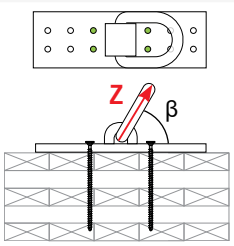
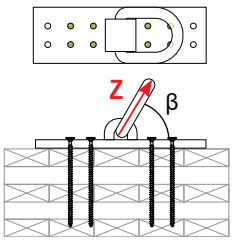
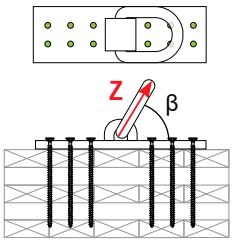
Table 3.6 - Reference Rigging Capacity (Z) of the Yoke 5T for Rigging Flat CLT Panels

Rigging Device	Specific Gravity [G]	Minimum Panel Thickness		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
Yoke 5T | 4 Screws 	≥ 0.42	**3-1/8**	[78]	Kombi LT	**1/2 × 3-1/8**	[12 × 80]	**1,910**	[8.50]
		4	[100]	Kombi	**1/2 × 4**	[12 × 100]	**1,820**	[8.10]
		4-3/4	[120]	Kombi LT	**1/2 × 4-3/4**	[12 ×120]	**2,370**	[10.54]
		6-1/4	[160]		**1/2 × 6-1/4**	[12 × 160]	**3,680**	[16.37]
	≥ 0.49	**3-1/8**	[78]	Kombi LT	**1/2 × 3-1/8**	[12 × 80]	**2,240**	[9.96]
		4	[100]	Kombi	**1/2 × 4**	[12 × 100]	**2,140**	[9.52]
		4-3/4	[120]	Kombi LT	**1/2 × 4-3/4**	[12 ×120]	**2,800**	[12.46]
		6-1/4	[160]		**1/2 × 6-1/4**	[12 × 160]	**4,220**	[18.77]

Notes:

1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Smaller sling angles require further capacity reductions as outlined in the Recommended Design Procedure section.
5. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
6. ASSY screws are designed for single use only. New screws must be used for each lift.

Table 3.7 - Reference Rigging Capacity (Z) of the Yoke XL for Rigging Flat CLT Panels

Rigging Device	Specific Gravity [G]	Minimum Panel Thickness		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
Yoke XL | 4 Screws 	≥ 0.42	**3-1/8**	[78]	Ecofast	**3/8 × 3-1/8**	[10 × 80]	**800**	[3.56]
		4	[100]	VG CSK	**3/8 × 4**	[10 × 100]	**1,890**	[8.41]
		6-1/4	[160]		**3/8 × 6-1/4**	[10 × 160]	**2,680**	[11.92]
	≥ 0.49	**3-1/8**	[78]	Ecofast	**3/8 × 3-1/8**	[10 × 80]	**940**	[4.18]
		4	[100]	VG CSK	**3/8 × 4**	[10 × 100]	**2,200**	[9.79]
		6-1/4	[160]		**3/8 × 6-1/4**	[10 × 160]	**3,110**	[13.83]
Yoke XL | 8 Screws 	≥ 0.42	**3-1/8**	[78]	Ecofast	**3/8 × 3-1/8**	[10 × 80]	**1,600**	[7.12]
		4	[100]	VG CSK	**3/8 × 4**	[10 × 100]	**3,780**	[16.81]
		6-1/4	[160]		**3/8 × 6-1/4**	[10 × 160]	**5,370**	[23.89]
	≥ 0.49	**3-1/8**	[78]	Ecofast	**3/8 × 3-1/8**	[10 × 80]	**1,890**	[8.41]
		4	[100]	VG CSK	**3/8 × 4**	[10 × 100]	**4,400**	[19.57]
		6-1/4	[160]		**3/8 × 6-1/4**	[10 × 160]	**6,230**	[27.71]
Yoke XL | 12 Screws 	≥ 0.42	**3-1/8**	[78]	Ecofast	**3/8 × 3-1/8**	[10 × 80]	**2,410**	[10.72]
		4	[100]	VG CSK	**3/8 × 4**	[10 × 100]	**5,670**	[25.22]
		6-1/4	[160]		**3/8 × 6-1/4**	[10 × 160]	**8,050**	[35.81]
	≥ 0.49	**3-1/8**	[78]	Ecofast	**3/8 × 3-1/8**	[10 × 80]	**2,840**	[12.63]
		4	[100]	VG CSK	**3/8 × 4**	[10 × 100]	**6,610**	[29.40]
		6-1/4	[160]		**3/8 × 6-1/4**	[10 × 160]	**9,340**	[41.55]

Notes:

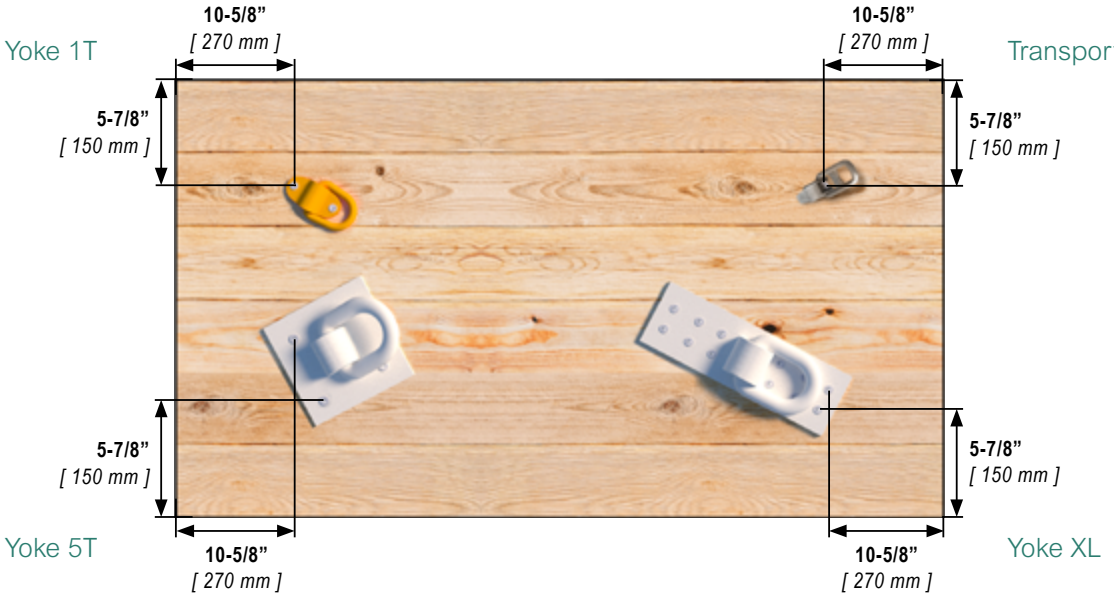
1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Smaller sling angles require further capacity reductions as outlined in the Recommended Design Procedure section.
5. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
6. ASSY screws are designed for single use only. New screws must be used for each lift.
7. For each screw option for the Yoke XL system, the screws must be placed in the holes as specified in the table above.

Table 3.8 - Suggested ASSY Screw Lengths for the Yoke Systems When Rigging CLT Panels

CLT Panel			Yoke 1T			Yoke 5T			Yoke XL		
PLY	Thickness										
	in.	[mm]	Fastener	in.	[mm]	Fastener	in.	[mm]	Fastener	in.	[mm]
3 PLY	3-1/8	[78]	Kombi LT	1/2 × 3-1/8	[12 × 80]	Kombi LT	1/2 × 3-1/8	[12 × 80]	Ecofast	3/8 × 3-1/8	[10 × 80]
	3-3/8	[87]									
	3-1/2	[89]							VG CSK	3/8 × 4	[10 × 100]
	4	[100]	Kombi	1/2 × 4	[12 × 100]	Kombi	1/2 × 4	[12 × 100]			
	4-1/8	[105]									
	4-3/4	[120]	Kombi LT	1/2 × 4-3/4	[12 × 120]	Kombi LT	1/2 × 4-3/4	[12 × 120]			
5 PLY	4	[100]	Kombi	1/2 × 4	[12 × 100]	Kombi	1/2 × 4	[12 × 100]	VG CSK	3/8 × 4	[10 × 100]
	4-3/4	[120]	Kombi LT	1/2 × 4-3/4	[12 × 120]	Kombi LT	1/2 × 4-3/4	[12 × 120]			
	5-1/8	[131]									
	5-1/2	[139]									
	5-5/8	[143]									
	6-1/4	[160]	Kombi LT	1/2 × 6-1/4	[12 × 160]	Kombi LT	1/2 × 6-1/4	[12 × 160]	VG CSK	3/8 × 6-1/4	[10 × 160]
	6-7/8	[175]									
	7-1/8	[180]									
	7-7/8	[200]									
7 PLY	4-3/8	[111]	Kombi	1/2 × 4	[12 × 100]	Kombi	1/2 × 4	[12 × 100]	VG CSK	3/8 × 4	[10 × 100]
	7-1/2	[191]									
	7-3/4	[197]									
	8-3/8	[213]	Kombi LT	1/2 × 6-1/4	[12 × 160]	Kombi LT	1/2 × 6-1/4	[12 × 160]	VG CSK	3/8 × 6-1/4	[10 × 160]
	8-5/8	[220]									
	9-5/8	[245]									

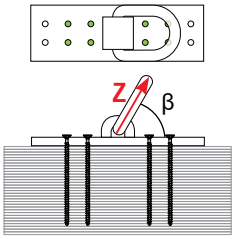
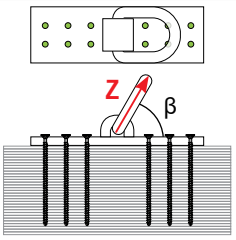
Notes:
1. The fastener lengths are suggestions only and can be adjusted to fit specific site conditions and rigging needs.
2. The thread penetration length of the fasteners determines the capacity of a rigging system.

End and Edge Distance Requirements



MPP Rigging Using Yoke Systems

Table 3.9 - Reference Rigging Capacity (Z) of the Yoke XL for Rigging Flat MPPs

Rigging Device	Specific Gravity [G]	Minimum Panel Thickness		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
Yoke XL | 8 Screws 	0.42	**2**	[51]	SK	**5/16 × 2-3/8**	[8 × 60]	**1,100**	[4.89]
		4	[100]	VG CSK	**3/8 × 4**	[10 × 100]	**2,910**	[12.94]
		6	[152]		**3/8 × 6-1/4**	[10 × 160]	**4,300**	[19.13]
Yoke XL | 12 Screws 	0.42	**2**	[51]	SK	**5/16 × 2-3/8**	[8 × 60]	**1,660**	[7.38]
		4	[100]	VG CSK	**3/8 × 4**	[10 × 100]	**4,370**	[19.44]
		6	[152]		**3/8 × 6-1/4**	[10 × 160]	**6,460**	[28.74]

Notes:
1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Smaller sling angles require further capacity reductions as outlined in the Recommended Design Procedure section. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
5. ASSY screws are designed for single use only. New screws must be used for each lift.
6. The screws must be placed in the holes as illustrated in the schematic for each option.

End and Edge Distance Requirements

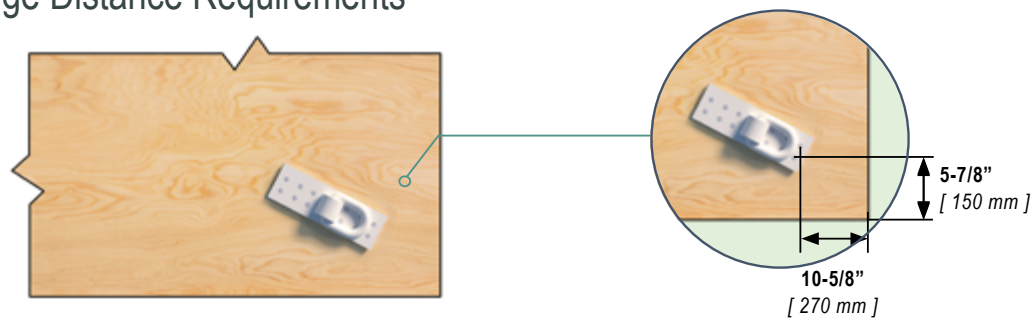


Table 3.10 - Suggested ASSY Screw Lengths for the Yoke XL Based on the MPP Thickness

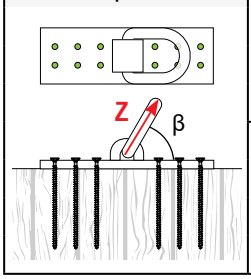
MPP Thickness		Yoke XL		
in.	[mm]	Fastener	in.	[mm]
2	[51]	SK	**5/16 × 2-3/8**	[8 × 60]
4	[100]	VG CSK	**3/8 × 4**	[10 × 100]
6	[152]		**3/8 × 6-1/4**	[10 × 160]

Notes:
1. The fastener lengths are suggestions only and can be adjusted to fit specific site conditions and rigging needs.
2. The thread penetration length of the fasteners determines the capacity of a rigging system.

Mass Timber Wall Panel Rigging

CLT Wall Panel Tilting from Edge Using Yoke Systems

Table 3.11 - Reference Rigging Capacity (Z) of the Yoke XL for Tilting CLT Wall Panels on their Edge

Rigging Device	Specific Gravity [G]	Minimum Panel Thickness		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
Yoke XL | 12 Screws 	≥ 0.42	**3-1/2**	[87]	VG CSK	**3/8 × 6-1/4**	[10 × 160]	**1,000**	[4.45]
	≥ 0.49	**3-1/2**	[87]	VG CSK	**3/8 × 6-1/4**	[10 × 160]	**1,200**	[5.34]

Notes:

1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Smaller sling angles require further capacity reductions as outlined in the Recommended Design Procedure section.
5. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
6. ASSY screws are designed for single use only. New screws must be used for each lift.
7. The listed reference rigging capacities (Z) are based on the assumption that the panel is tilted with one end bearing on a stable surface.

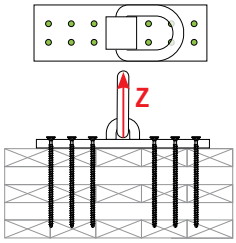
Tilting Up CLT Wall Panels with the Yoke XL

End and Edge Distance Requirements

For wall panel rigging on the narrow edge of CLT panels, only the Yoke XL is used as it uses small-diameter fasteners. The reduced edge distance requirements below are a minimum and apply only to the Yoke XL.

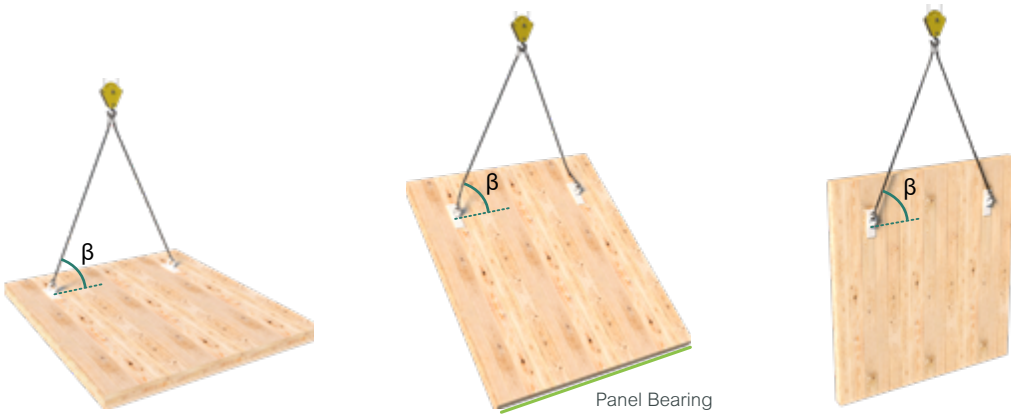
CLT Wall Panel Tilting from Face Using Yoke Systems

Table 3.12 - Reference Rigging Capacity (Z) of the Yoke XL for Lifting CLT Wall Panels on their Face

Rigging Device	Specific Gravity [G]	Minimum Panel Thickness		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
Yoke XL | 12 Screws 	≥ 0.42	**4**	[100]	VG CSK	**3/8 × 4**	[10 × 100]	**3,100**	[13.79]
		6-1/4	[160]		**3/8 × 6-1/4**	[10 × 160]		
	≥ 0.49	**4**	[100]	VG CSK	**3/8 × 4**	[10 × 100]	**3,500**	[15.57]
		6-1/4	[160]		**3/8 × 6-1/4**	[10 × 160]		

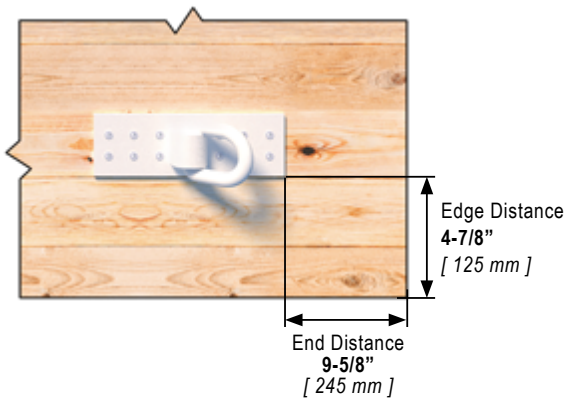
Notes:

1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
5. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Smaller sling angles require further capacity reductions as outlined in the Recommended Design Procedure section.
6. ASSY screws are designed for single use only. New screws must be used for each lift.
7. Listed reference rigging capacities (Z) assume the panel is tilted with the anchors placed on the panel face with one end bearing on a stable surface.
8. The screw length and panel thickness must be considered to prevent the screw from penetrating through the panel.
9. For tilt-up applications, the Anchor Resistance Reduction Factor (RAR) is equal to 1.0.



Tilting Up CLT Wall Panels from Face Using the Yoke XL

End and Edge Distance Requirements

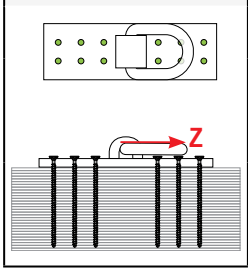


Note:

1. See Table 3.8 for suggested fastener lengths.

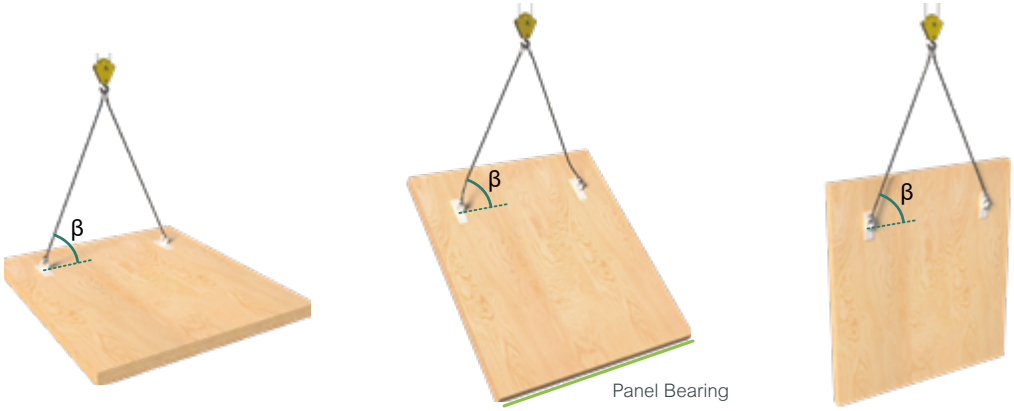
MPP Wall Panel Tilting from Face Using Yoke Systems

Table 3.13 - Reference Rigging Capacity (Z) of the Yoke XL for Lifting MPP Wall Panels on Their Face

Rigging Device	Specific Gravity [G]	Minimum Panel Thickness		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
Yoke XL | 12 Screws 	< 0.49	**2**	[51]	SK	**5/16 × 2-3/8**	[8 × 60]	**3,100**	[13.79]
		4	[100]	VG CSK	**3/8 × 4**	[10 × 100]	**4,500**	[20.02]
		6	[152]		**3/8 × 6-1/4**	[10 × 160]		

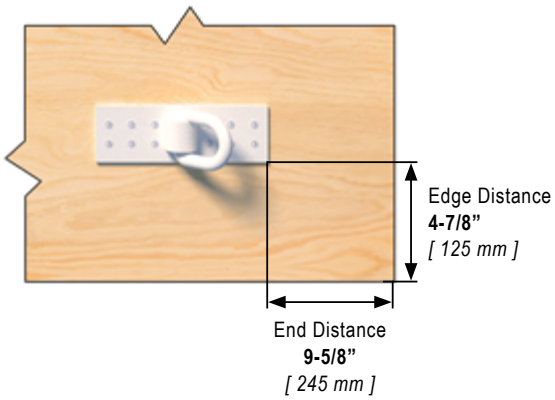
Notes:

1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
5. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Smaller sling angles require further capacity reductions as outlined in the Recommended Design Procedure section.
6. ASSY screws are designed for single use only. New screws must be used for each lift.
7. Listed reference rigging capacities (Z) assume that the panel is tilted with the anchors placed on its face while one end bears on a stable surface.
8. Screw length and panel thickness must be considered to prevent through penetration of the screw.
9. For tilt-up applications, the Anchor Resistance Reduction Factor (RAR) is equal to 1.0.



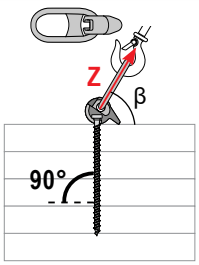
Tilting Up MPP Wall Panels from Face with the Yoke XL

End and Edge Distance Requirements



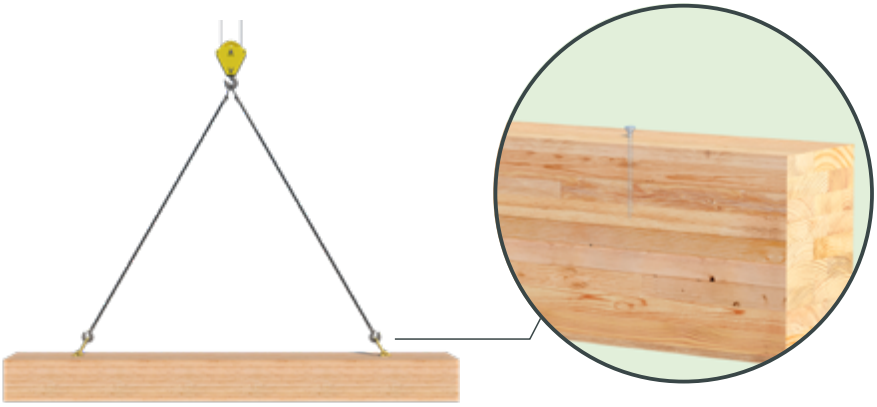
Glulam Beam and Log Rigging

Table 3.14 - Reference Rigging Capacity (Z) of the Transport Anchor (TA) Installed with Screws at 90° for Rigging Glulam Beams and Logs

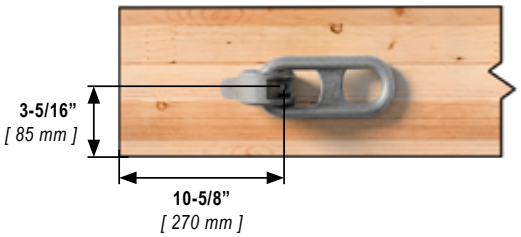
Rigging Device	Specific Gravity [G]	Minimum Element Thickness		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
TA | 1 Screw 	≥ 0.42	**6-5/8**	[168]	Kombi LT	**1/2 × 3-1/8**	[12 × 80]	**350**	[1.56]
					1/2 × 4-3/4	[12 × 120]	**570**	[2.54]
					1/2 × 6-1/4	[12 × 160]	**700**	[3.11]
	≥ 0.49	**6-5/8**	[168]	Kombi LT	**1/2 × 3-1/8**	[12 × 80]	**410**	[1.82]
					1/2 × 4-3/4	[12 × 120]	**650**	[2.89]
					1/2 × 6-1/4	[12 × 160]	**800**	[3.56]

Notes:

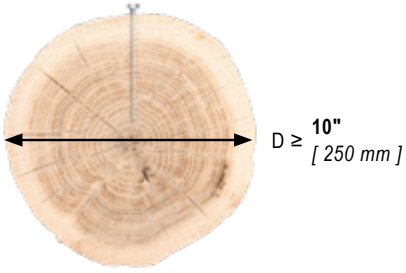
1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Smaller sling angles require further capacity reductions as outlined in the Recommended Design Procedure section.
5. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
6. ASSY screws are designed for single use only. New screws must be used for each lift.
7. Listed reference rigging capacities (Z) are valid for screws installed at 90° to the beam or log surface.
8. The fastener head must sit 7/8" [20 mm] above the surface of the rigged element to ensure proper engagement of the anchor.
9. The Transport Anchor must be engaged and aligned with the axis angle of the lifting slings as described in the Installation Instructions section.
10. Listed reference rigging capacities (Z) are valid for logs with a minimum diameter of 10".



End and Edge Distance Requirements

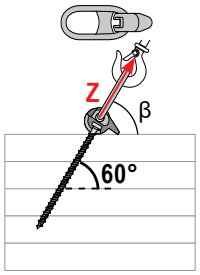


Glulam Members



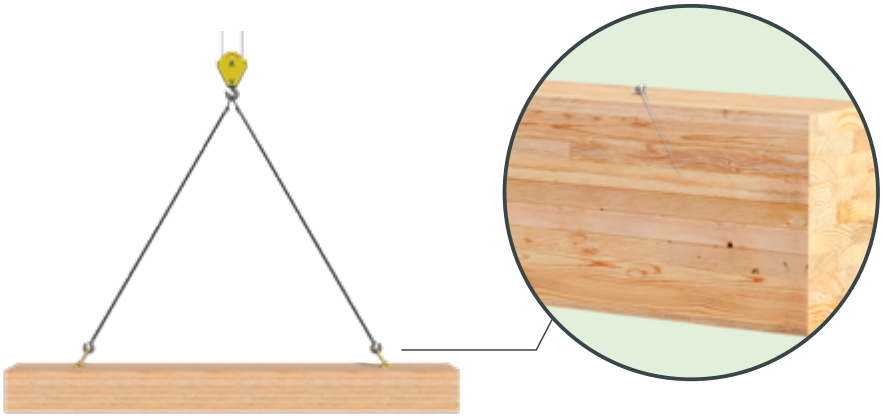
Log Members

Table 3.15 - Reference Rigging Capacity (Z) of the Transport Anchor (TA) Installed with Screws at 60° for Rigging Glulam Beams and Logs

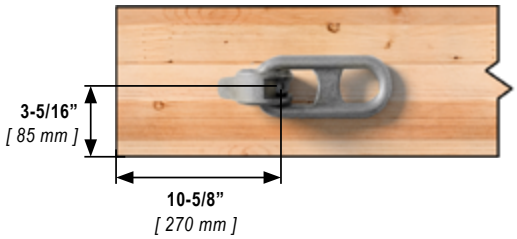
Rigging Device	Specific Gravity [G]	Minimum Element Thickness		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
TA | 1 Screw 	≥ 0.42	**6-5/8**	[168]	Kombi LT	**1/2 × 4-3/4**	[12 × 120]	**700**	[3.11]
					1/2 × 6-1/4	[12 × 160]	**1,000**	[4.45]
	≥ 0.49	**6-5/8**	[168]	Kombi LT	**1/2 × 4-3/4**	[12 × 120]	**800**	[3.56]
					1/2 × 6-1/4	[12 × 160]	**1,200**	[5.34]

Notes:

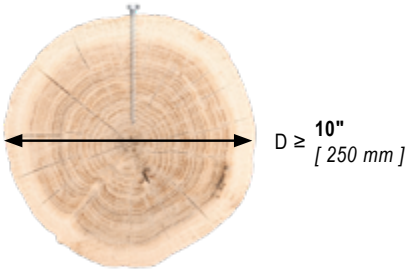
1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Smaller sling angles require further capacity reductions as outlined in the Recommended Design Procedure section.
5. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
6. ASSY screws are designed for single use only. New screws must be used for each lift.
7. Listed reference rigging capacities (Z) are valid for screws installed at 60° to the beam or log surface.
8. The fastener head must sit 7/8" [20 mm] above the surface of the rigged element to ensure proper engagement of the anchor.
9. The Transport Anchor must be engaged and fastener axis must be aligned with the axis angle of the lifting slings as described in the Recommended Design Procedures section.
10. Listed reference rigging capacities (Z) are valid for logs with a minimum diameter of 10".



End and Edge Distance Requirements

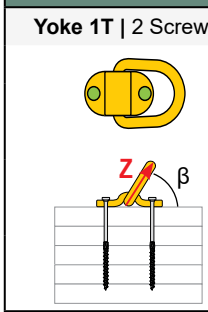


Glulam Members



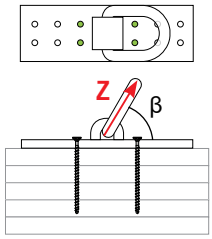
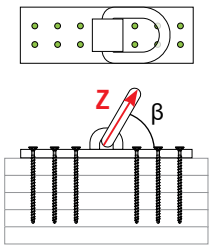
Log Members

Table 3.16 - Reference Rigging Capacity (Z) of the Yoke 1T for Rigging Glulam Beams

Rigging Device	Specific Gravity [G]	Minimum Beam Width		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
Yoke 1T | 2 Screws 	≥ 0.42	**6-5/8**	[168]	Kombi LT	**1/2 × 4-3/4**	[12 × 120]	**1,320**	[5.87]
					1/2 × 6-1/4	[12 × 160]	**1,870**	[8.32]
	≥ 0.49	**6-5/8**	[168]	Kombi LT	**1/2 × 4-3/4**	[12 × 120]	**1,560**	[6.94]
					1/2 × 6-1/4	[12 × 160]	**1,870**	[8.32]

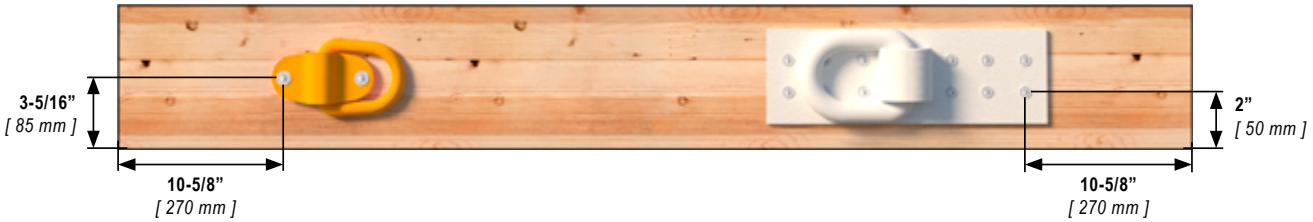
Note:
1. See notes under the following table.

Table 3.17 - Reference Rigging Capacity (Z) of the Yoke XL for Rigging Glulam Beams

Rigging Device	Specific Gravity [G]	Minimum Beam Width		Fastener Option			Reference Rigging Capacity [Z]	
		in.	[mm]		in.	[mm]	lb.	[kN]
Yoke XL | 4 Screws 	≥ 0.42	**5-1/8**	[130]	VG CSK	**3/8 × 4**	[10 × 100]	**1,890**	[8.41]
					3/8 × 6-1/4	[10 × 160]	**2,680**	[11.92]
	≥ 0.49				**3/8 × 4**	[10 × 100]	**2,200**	[9.79]
					3/8 × 6-1/4	[10 × 160]	**3,110**	[13.83]
Yoke XL | 12 Screws 	≥ 0.42	**5-1/8**	[130]	VG CSK	**3/8 × 4**	[10 × 100]	**5,670**	[25.22]
					3/8 × 6-1/4	[10 × 160]	**8,050**	[35.81]
	≥ 0.49				**3/8 × 4**	[10 × 100]	**6,610**	[29.40]
					3/8 × 6-1/4	[10 × 160]	**9,340**	[41.55]

Notes:
1. All rigging design must meet relevant requirements outlined in the General Notes to the Designer and Installer section.
2. Listed reference rigging capacities (Z) comply with the safety and regulatory requirements for hoisting and rigging products, as described in the General Notes to the Designer and Installer section.
3. Listed reference rigging capacities (Z) must be adjusted with the appropriate modification factors, as outlined in the Recommended Design Procedure section.
4. Listed reference rigging capacities (Z) are calculated by reducing the maximum rigging capacities at vertical (90°) for a typical sling angle (β) of 60°. Smaller sling angles require further capacity reductions as outlined in the Recommended Design Procedure section.
5. Listed reference rigging capacities (Z) are valid only with listed ASSY screws.
6. ASSY screws are designed for single use only. New screws must be used for each lift.
7. For the different screw options of the Yoke XL system, the screws must be placed in the holes as specified in the table above.

End and Edge Distance Requirements

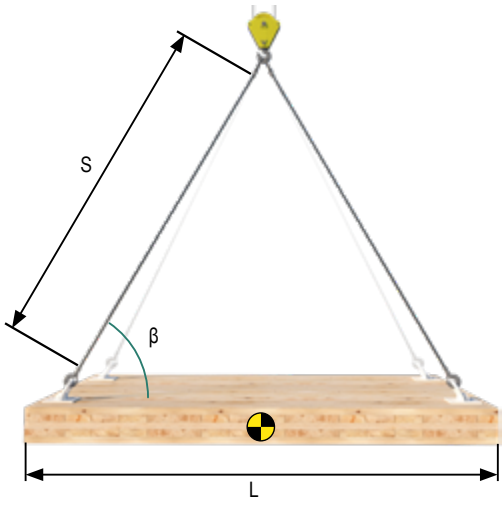


Fair Heaven Homes

Vancouver, British Columbia

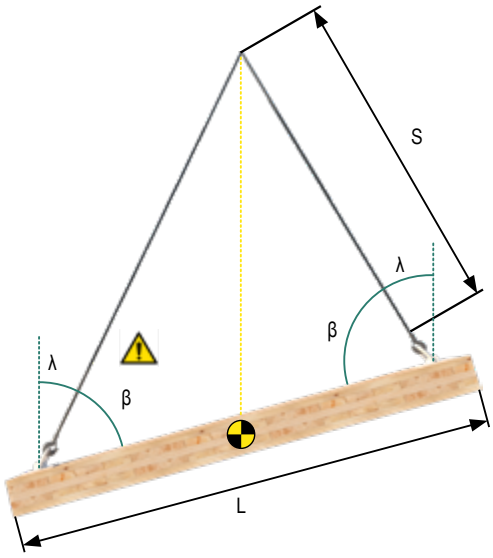
Check Sling Angle

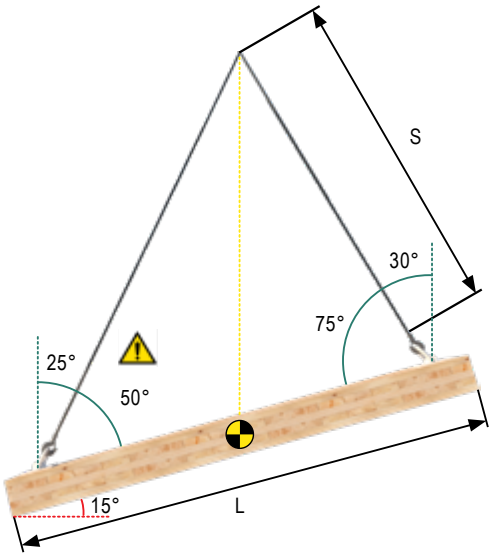
Tabulated reference rigging capacity per anchor values (Z) are valid for rigging scenarios with a minimum sling angle (β)—measured between the sling and the element surface—of 60°. If the sling length (S) is greater than the element length (L), as illustrated in the figure below, β will be greater than 60°.



Check β > 60° if S > L

For cases where sling angle (β) < 60°, an appropriate reduction factor (R_{AR}) must be applied to determine the adjusted anchor capacity (Z').





Example of a Panel Angled at 15°

Check Load Spreading

When using more than two anchors, it is important to avoid uneven load sharing. Without an adequate compensation system such as a load spreader, load may be unevenly distributed, forcing the entire load into two slings while the remainder hang slack. In such cases, the total force per anchor (F) must be divided by a load spreader adjustment factor (R_{LS}) of 0.5.

Example of Uneven Load Sharing

For Floor Panels

When lifting CLT floor panels using an adequate compensation system, such as a load spreader, as seen below, even load sharing may be assumed.

For Wall Panels

When lifting CLT wall panels, a load spreader can be used to further stabilize the load while increasing the sling angle (β).

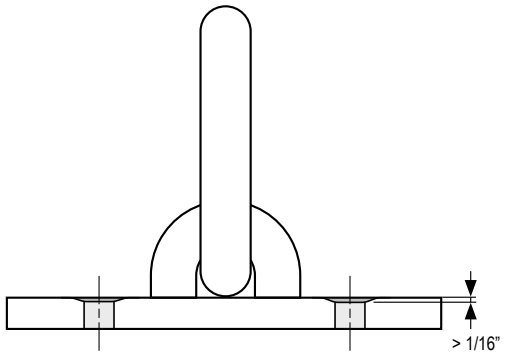
Check Anchor Condition

All rigging devices must be examined frequently by a trained safety professional. Additional inspection of devices prior to each lift is recommended to ensure a safe lifting procedure and proper quality control. Anchors must be inspected for any signs of damage (e.g., external wear, cuts, and cracks). If the anchor is deemed damaged, the device must be taken out of circulation immediately.

Anchors must be safely transferred between lifts to prevent damage (e.g., microcracks) that can compromise their overall capacity and pose potential safety hazards. If proper inspection is done, anchors can be reused on multiple rigging projects. However, fasteners should never be reused for panel rigging to ensure safety and proper system capacity.

Yoke Systems

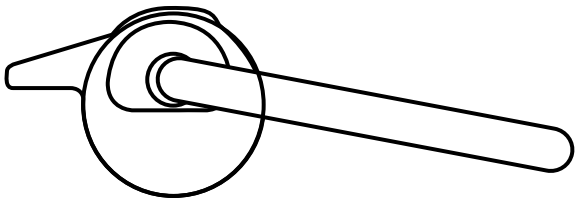
The Yoke systems must be inspected for damage to the powder-coated finish and any corrosion that may affect system capacity. No repair or modification of any kind, particularly welding, is permitted for the yoke systems. Wear can occur near the screw holes. Normal wear should not exceed 1/16 in. in depth. If wear > 1/16 in. is observed, the Yoke must be removed from service and replaced.

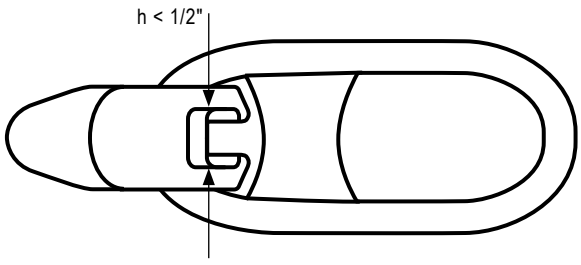


Transport Anchor Systems

The Transport Anchor must be inspected for any damage to the galvanized finish and any corrosion that may affect system capacity. No repair or modification of any kind, particularly welding, is permitted for the Transport Anchor. Screws may be used for more than one lift in a single installation if they are inspected between lifts and shows no signs of damage. Screws should be discarded upon removal and not reused.

The receiver mouth width (h) must not exceed 1/2 in. [13 mm]. If the inspection concludes that h > 1/2 in. [13 mm], the Transport Anchor must be taken out of circulation immediately. A larger receiver mouth is unable to properly engage the screw during rigging and poses potential safety hazards.





Philip J. Currie Dinosaur Museum

Wembley, Alberta

Courtesy of Structurecraft

Accessories

Bits

Patented Bits for ASSY Fasteners

The ASSY RW Bits are hardened bits designed for quick and efficient installation of ASSY fasteners. The new RW Bits are an upgrade of the AW Bits, requiring fewer bit changes for different fastener diameters. The AW and RW Bits are compatible with AW and RW drives, but the RW Bits provide better performance. Suitable bits for each fastener are listed in its specification table.

Snug Fit

Reduce Wobbling

Optimum Torque Transfer

ASSY RW Bits

Designed for	Partially Threaded Fasteners 4.0 Series
	Fully Threaded Fastener Series

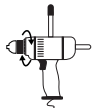
RW 30 RW 40 RW 50

Magnetic Hex Socket

Accessory for Installing ASSY Kombi Screws

The Magnetic Hex Socket can be used for faster installation of the ASSY Kombi screw. The built-in magnet makes it easy to place and hold the screw head inside the socket before installation. The magnetic socket is suitable for use with most low-RPM, high-torque drills that are used in the installation of ASSY self-tapping screws.

Hex Head



Suitable for Double-Handled Drills

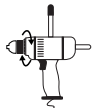
Optimum Torque Transfer

Bit Holder Socket

Bit Holder Socket for AW 50 & RW 50 Bits

The Bit Holder Socket is designed to hold the AW 50 and RW 50 Bits on large double-handled drills.

AW 50 & RW 50 Compatible



Suitable for Large Drills

Optimum Torque Transfer

Kwantlen Polytechnic University

Richmond, British Columbia

Appendix

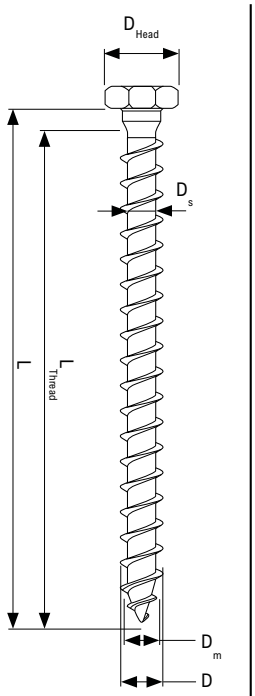
Appendix A: Product Specifications

This appendix provides dimensions for the hardware specified in this guide, including fasteners, their corresponding bits, and anchors. For assistance with substitute fastener options, please contact our Technical Support Team.

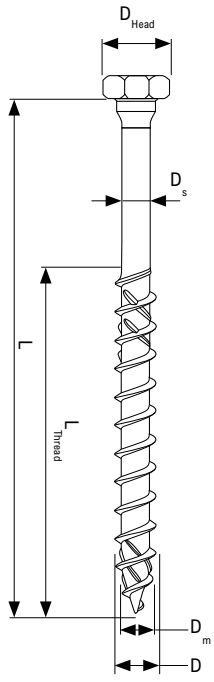
Fastener Specifications

Table A.1 - Specified Fastener Geometry

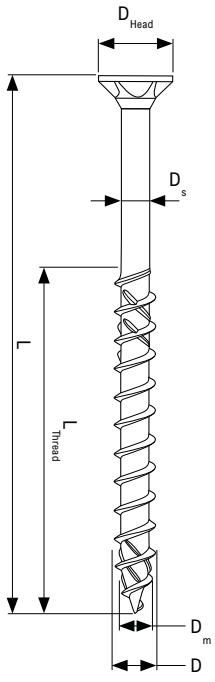
Fastener Series	D	L		L_{Thread}		D_{Head}	D_m	D_s	Drive Bit
	in. [mm]	in.	[mm]	in.	[mm]	in. [mm]			
SK 4.0	1/4 [6]	2	[50]	1-3/4	[45]	0.551 [14]	0.154 [3.9]	0.175 [4.4]	RW 40
		2-3/8	[60]	1-1/2	[37]				
SK 4.0	5/16 [8]	2-3/8	[60]	2	[50]	0.870 [22.1]	0.209 [5.3]	0.228 [5.8]	RW 40
VG CSK	3/8 [10]	4	[100]	3	[77]	0.774 [20]	0.244 [6.2]	0.433 [11]	RW 50
		6-1/4	[160]	5-3/4	[145]				
Ecofast 4.0		3-1/8	[80]	2	[50]	0.728 [18.5]	0.256 [6.5]	0.283 [7.2]	RW 40
Kombi LT 3.0	1/2 [12]	3-1/8	[80]	2-3/4	[70]	0.669 [17]	0.283 [7.2]	0.322 [8.2]	RW 40 or 11/16" Socket
		4-3/4	[120]	4	[100]				
		6-1/4	[160]	5-3/4	[145]				
Kombi 4.0		4	[100]	2-3/8	[60]				



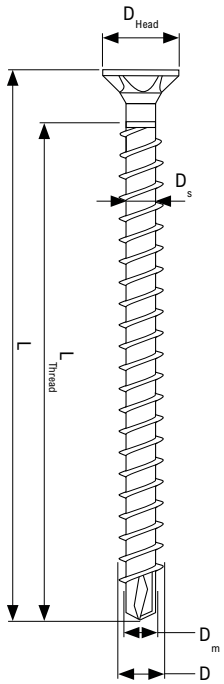
Kombi LT 3.0



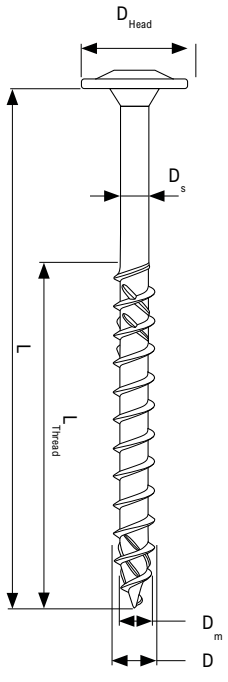
Kombi 4.0



Ecofast 4.0



VG CSK

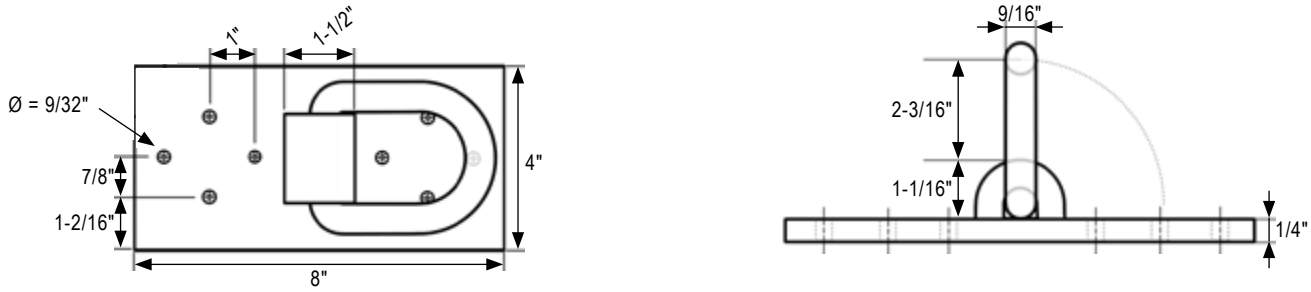


SK 4.0

Note:

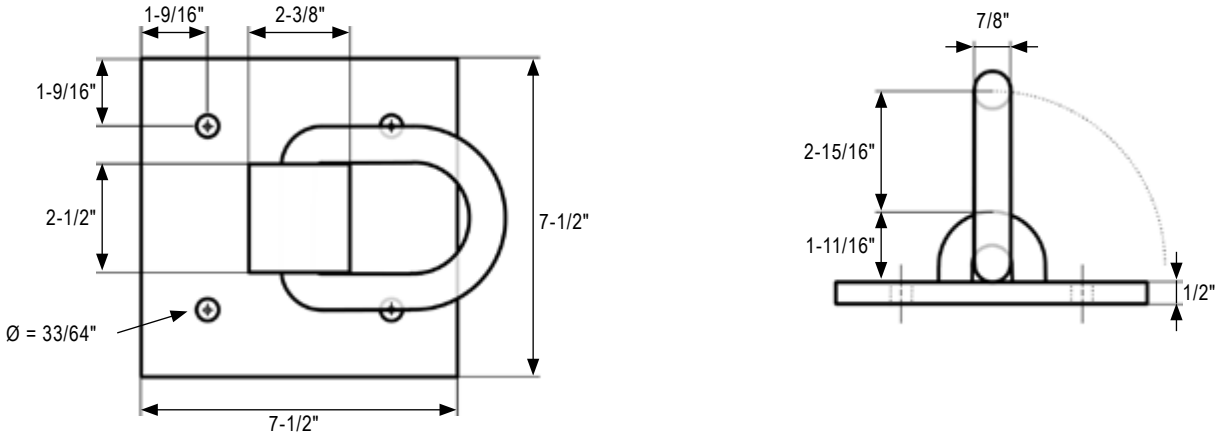
1. Drawings are not to scale.

Anchor Specifications

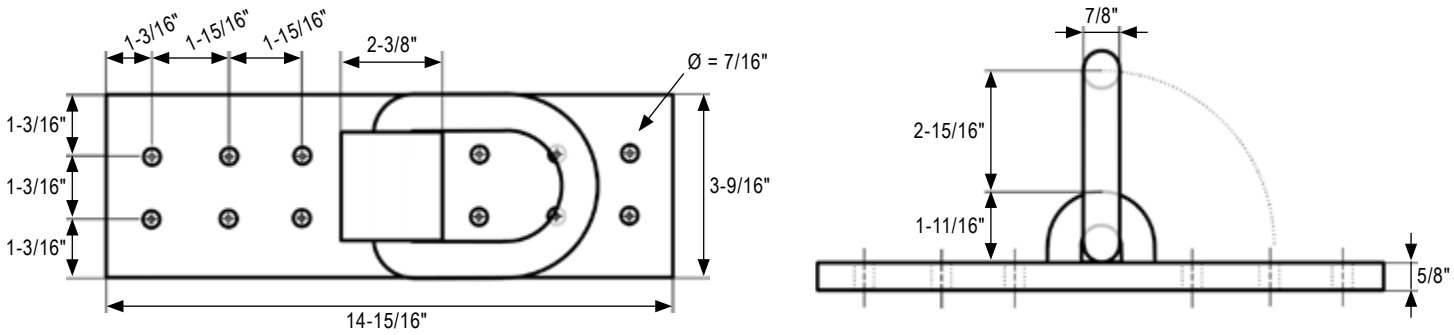


Mini Yoke Anchor Specifications

Yoke 1T Specifications



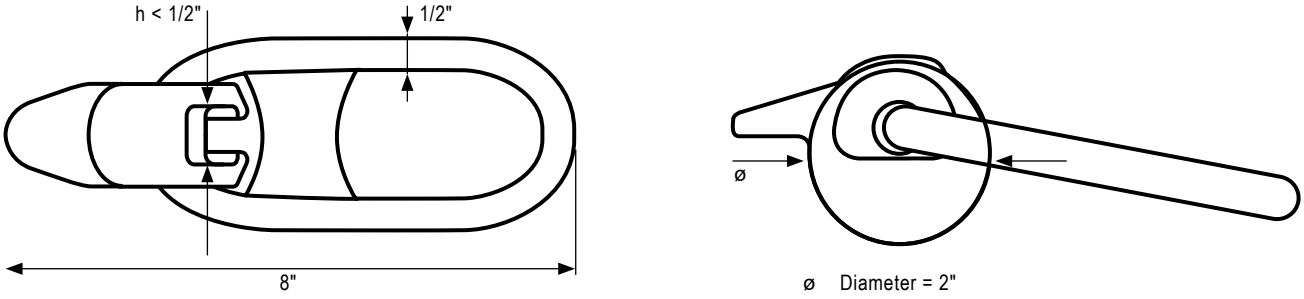
Yoke 5T Specifications



Yoke XL Specifications

Note:

1. Drawings are not to scale.



Transport Anchor Specifications

Note:

1. Drawings are not to scale.

Appendix B: Installation Guidelines

This section highlights the recommended installation sequence and instructions for fasteners used in conjunction with the anchors specified in this document. Prior to commencing installation, the installer should create a list and assemble all tools required according to the type and diameter of the fasteners to be installed. Installers should ensure all tools are properly calibrated, that proper PPE is worn, and all necessary safety precautions are taken. A certified professional must ensure that the rigging plan is appropriate and considers the working load limit.

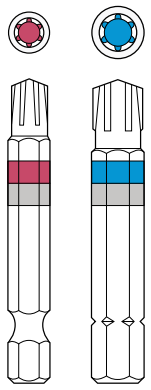
General Fastener Installation and Removal

I Use the Correct Bit

MTC Solutions fasteners should only be driven using the AW or RW Bits, which combine the advantages of both Torx and Phillips bits. This approach ensures good centering and positioning with optimal torque transmission.

Note:

1. For information on bit selection, refer to the tables in Appendix A.



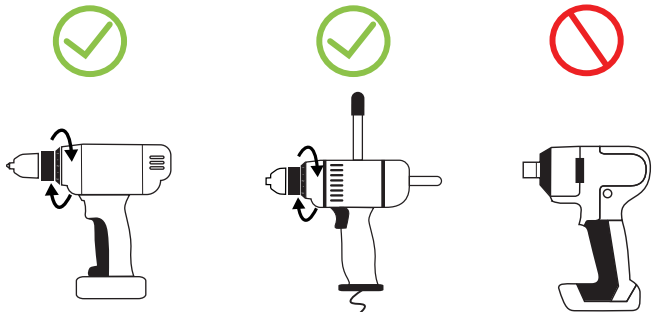
RW 40 RW 50

II Use the Correct Drill

Use low-RPM, high-torque drills to install MTC Solutions fasteners. Avoid excessive acceleration and deceleration during the drive-in process. The drill speed should be maintained at 300–400 RPM. Do not use impact drills. Do not over-torque fasteners. Use the appropriate drill chuck size according to the fastener diameter:

B.1 - Recommended Drill Chuck Sizes

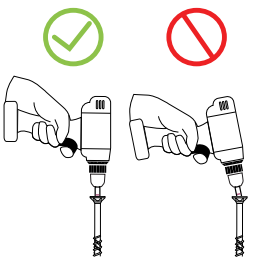
Nominal Fastener Diameter [D]		Drill Chuck Size
in.	[mm]	in.
1/4	[6]	1/2
5/16	[8]	
3/8	[10]	3/4
1/2	[12]	



Cordless Clutched Drills Double-Handled Drills Impact Drills

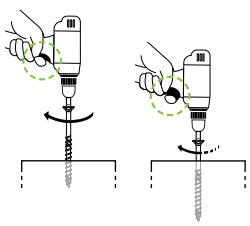
III Align Drill Bit Axis

The drill bit axis must be parallel to the fastener axis during installation to ensure proper torque transmission and to avoid stripping the housing of the bit.



IV Decrease RPM

To avoid over-torquing the screw, especially in steel-to-wood connections, decrease the rotation speed about 1/2 in. away from the final installed position.

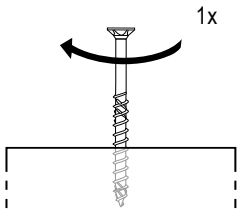


V Do Not Press on the Drill

Do not apply excessive pressure on the drill once the fastener is engaged, as a slight amount of buckling will cause the fastener to deviate from its intended path. Only apply the required force or use the recommended holder case to eliminate cam-out effects.

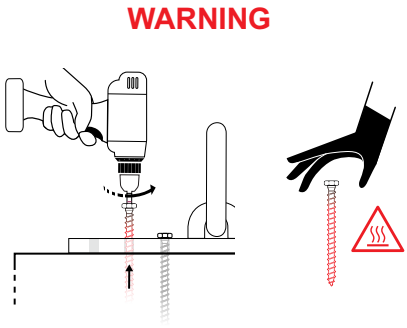
VI Install in a One-Step Process

To avoid increased torque peaks caused by stopping and restarting the drive-in process, install the screw in one run until the head is lightly seated against the side member. If necessary, a torque wrench may be used to complete installation immediately after the fastener has been driven.



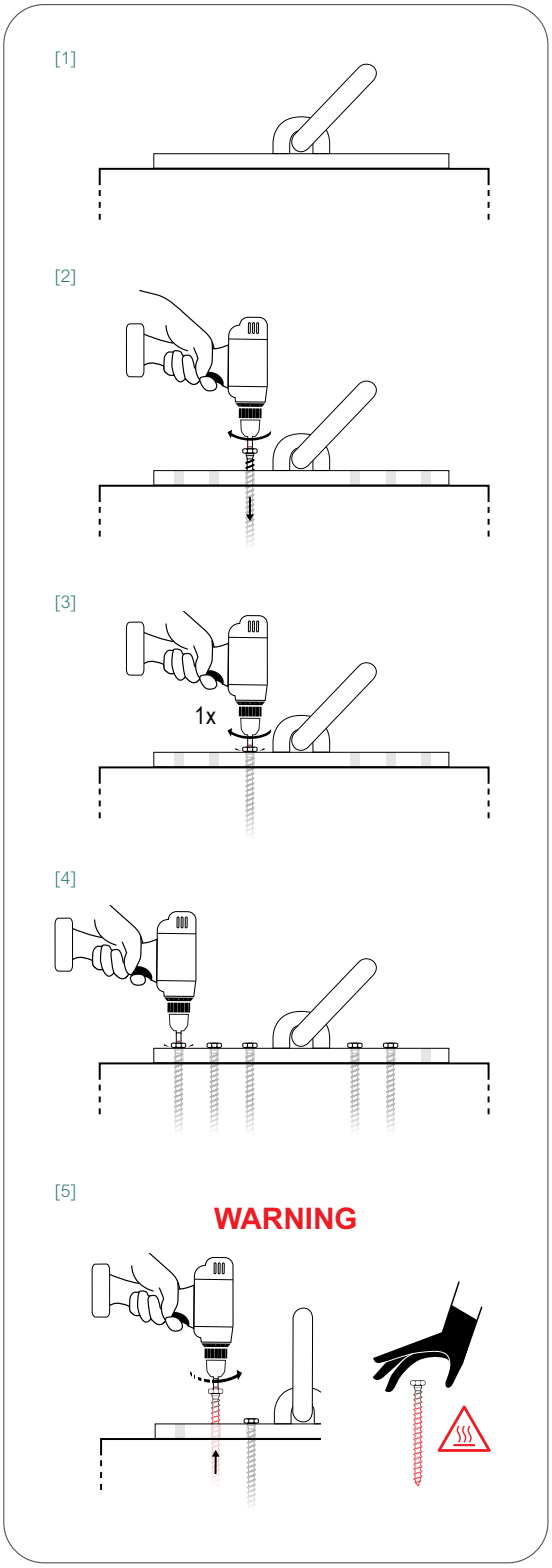
VII Remove Fasteners after Use

It is normal to apply more pressure on the fastener during removal than during installation. **WARNING: Fasteners Will Be HOT.** The removal process generates heat around the fastener; heat-resistant gloves should be used to handle fasteners. Only handle the screw with gloves when the drill is no longer engaged and the screw is no longer rotating. The screw may grip and pull gloves if grabbed during rotation. Screws will be hot upon removal and can burn bare skin.



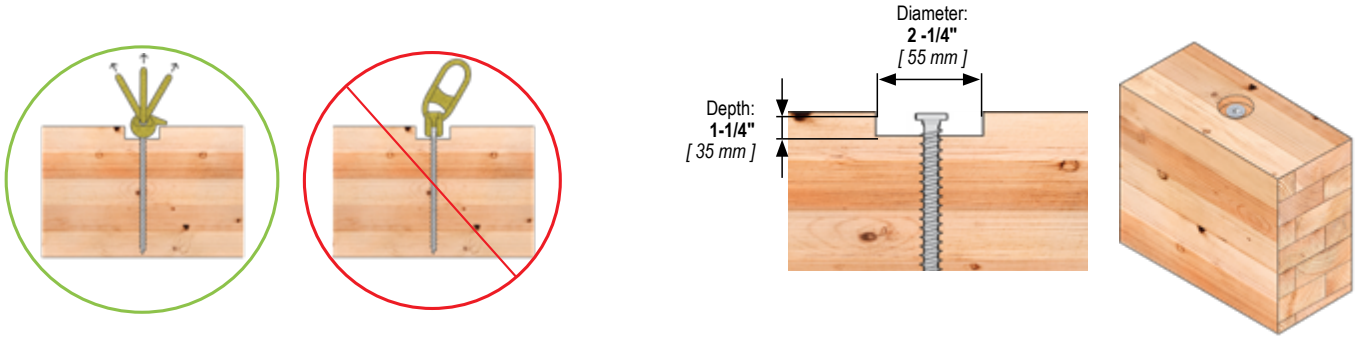
Installation and Removal Instructions for Systems with Multiple Fasteners (Yoke Series)

1. Place the anchor base at its intended final position on the wood member.
2. Start the fastener installation process from the innermost screws to the outermost ones. In general, starting with the innermost screws and moving towards the outer edges allows for residual stresses to be released. If splitting or other damage to the wood occurs during fastener installation, contact the Engineer of Record for advice.
3. Continue the installation process until the fastener head lightly contacts the anchor. Install the fastener from tip to head without interruption.
4. Install the remaining screws consistently from one side of the connection to the other, stopping when the fastener head lightly contacts the steel plate.
5. Use the correct drill and bit to reverse the screws out from the wood element after the lift is completed. Ensure that the drill is aligned on the same axis for installation and removal, and if possible, set the drill to its lowest speed. Apply steady, even pressure to maintain drill bit engagement during removal—it is normal to apply more pressure on the fastener during removal than during installation. **Screws will be hot upon removal and can burn bare skin.** Screws must not be reused and must be discarded after use.



Transport Anchor Housing

The Transport Anchor can be placed on the surface of the rigged element for simple and easy installation. Alternatively, it can also be installed in a pre-cut circular housing for a flush finish. This approach allows the screw to be left installed but out of the way after the lift. A circular housing 1-1/4 in. [30 mm] deep and 2-1/4 in. [55 mm] in diameter is recommended. In both cases (with and without housing), the anchor must always be engaged properly during lifting, and any misalignment with the axis angle of the lifting slings must be avoided, as shown in the figure below. Additionally, the fastener head must sit 7/8 in. [20 mm] above the element surface for proper engagement of the anchor.

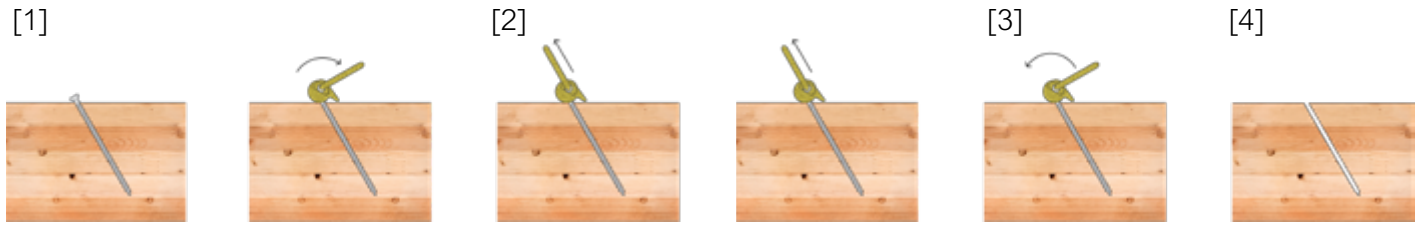


Installing the Transport Anchor generally involves four steps:
[1] Install the screw 7/8 in. [20 mm] above the element surface to engage the anchor
[2] Align the anchor loop with the proper sling angle
[3] Remove the anchor after lifting by unhooking it from the screw
[4] Remove the screw (optional)

Installation with Housing

Installation without Housing

Installation with an Inclined Screw and without Housing



Appendix C: Workflow Considerations

On-site Considerations

The prefabricated nature of mass timber elements allows for fast and efficient installation on-site. Most mass timber manufacturers consider sequencing of material, with the trucks arriving in the sequence in which the elements are set to be installed. For rigging, it is advantageous to keep up with the material workflow by steadily unloading truck beds and maximizing crane efficiency. Considering this, it is recommended to follow a circular workflow using four sets of rigging hardware to reduce delays on-site.

1

One set is installed on the element on the truck bed

2

One set is used for rigging the element into place

3

One set is unmounted from the element in place

4

One set is transported back to the truck

MTC Solutions provides sustainable, high-quality mass timber connection solutions to a rapidly evolving and thriving industry. We drive innovation through certified research and development, while contributing to the education of young talent and experienced professionals in the technology used in sustainable design.

Credit Stephane Groleau

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