

# Multiple Lumber & Engineered Wood Beams

Side-Loaded / Top-Loaded Beams

# Tech Bulletin

Connection Details

## USES/FASTENER INFO:

- **The Superior Alternative to the Common Lag Screws, ideal for a contractor!**  
Heat treated and hardened, these screws are stronger and more durable than ordinary lag screws. They have deep cutting threads for quick, easy driving and a sharp notched point for exact, quick starting with less "walking". The Big Timber® screws have a built-on washer head with smooth edges giving them a professional finish.
- **The Big Timber® screws are used in Structural wood-to-wood connections.**  
May be used where fasteners are required to exhibit corrosion resistance when exposed to adverse environmental conditions and/or preservative-treated wood, and are alternates to hot-dip-zinc galvanized coated fasteners.
- **The coatings for the different types of screws differ in pigmentation only.**  
Big Timber® screws proprietary Triple Ceramic Coating has been evaluated for a corrosion resistance in both ACQ and salt spray conditions.
- **Unique design reduces need for pre-drilling**

The Big Timber® screws comply with, or are suitable alternatives to what is specified in, the 2015/2012/2009 International Building Code (IBC) and 2015/2012/2009 International Residential Code (IRC), 2016 California Building Code (CBC) and the 2016 California Residential Code (CRC); also meet additional requirements of the CBC Chapters 16, 16A, 17, 17A, and 23, as applicable. 2014 Florida Building Code - Building and the 2014 Florida Building Code - Residential; also in compliance with the High-Velocity Hurricane Zone provisions of each.

## INSTALLATION:

- Pilot holes are not required.
- Select appropriate Big Timber® screw.
- Screws must be installed with the minimum spacing, end distances, and edge distances needed to prevent splitting.
- Select appropriate sized drill bit - Star Drive or Hex Head  
CTX#14 = T-25 | CTX#15 = T-30 | CTX#17 = T-40 | BL14 and GL17 = 5/16" Hex Head
- Install the screws with a standard low speed/high torque powered tool into the outer most ply, not by driving with a hammer.
- Allow the underside of the washer head to pull the plies firmly together.

Refer to this bulletin for proper fastener size selection and fastening pattern.

Always consult a registered design professional for critical assembly/fastening requirements and follow all local building codes.

## SPACING REQUIREMENTS:

- A Minimum Edge Distance:**  
CTX#14 = 1 1/4" | CTX#15 = 1 1/2" | CTX#17 = 1 3/4" | BL14 = 1 1/2" | GL17 = 1 3/4"
- B Minimum End Distance:**  
CTX#14 = 1 1/4" | CTX#15 = 2" | CTX#17 = 2 1/4" | BL14 = 1 1/2" | GL17 = 2 1/4"
- C Minimum Spacing Between Fasteners in a Row:**  
CTX#14 = 1 1/4" | CTX#15 = 2" | CTX#17 = 2 1/4" | BL14 = 1 1/2" | GL17 = 2 1/4"
- D Minimum Spacing Between Rows of Fasteners:**  
CTX#14 = 1/2" | CTX#15 = 1/2" | CTX#17 = 3/4" | BL14 = 1/2" | GL17 = 3/4"

## GENERAL NOTES:

- Assure proper lamination condition prior to fastening.
- Maintain lamination and joining surface contact during assembly.
- Observe side and end LVL surfaces and avoid any signs of delamination.
- Maintain screw drive rotational speed and driving tool pressure to provide good screw thread engagement when entering lamination members of varying material properties.
- Assure screws are new and in good condition, free from damage during shipping and handling.
- Use drive and installation tools which are of the proper size, fit correctly, and have been maintained in good condition.
- **Comply with all applicable building codes.**
- Specify and install LVL members, fasteners, and related hardware that are capable of supporting the design loads with the appropriate design factor.
- **Consult architectural, engineering, design and build professionals who are qualified and licensed for the intended work.**
- Periodic inspection and preventive maintenance are important factors in good service life performance.

Always consult a registered design professional for critical assembly/fastening requirements and follow all local building codes.

## FASTENER SIZE SELECTION:

### Construction Lag Screws "CTX"

Star Drive Round Washer Head

#14x: 2 1/2", 3", 4", 5", 6"

Thread Length: 1 1/2" - 3"

#15x: 3", 3 1/2", 4", 5", 6"

Thread Length: 1 1/2" - 3"

#17x: 7", 8", 10", 12"

Thread Length: 3 1/2" - 4"



### Black Log "BL"

Hex Washer Head

14x: 4", 6", 8", 10", 12", 14"

Thread Length: 2" - 2 1/2"

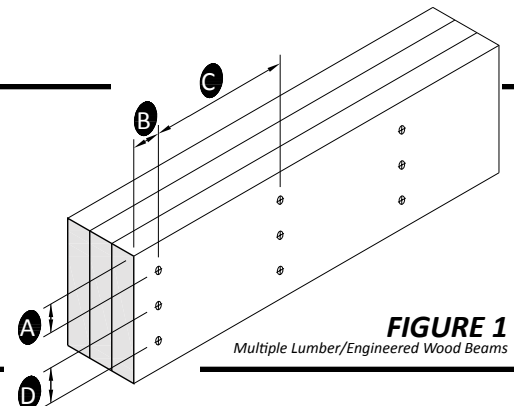


### Grey Log "GL"

Hex Washer Head

17x: 5", 7", 9", 11"

Thread Length: 3"



**FIGURE 1**

Multiple Lumber/Engineered Wood Beams

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53 N. 15th St.  
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Tested Fasteners "CTX"  
as reported in  
ICC-ES Report  
ESR-3534  
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"Black Log"  
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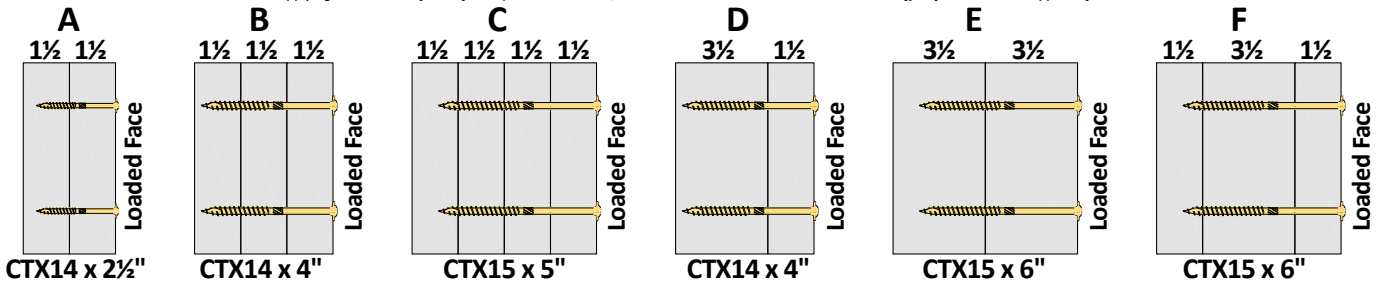
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**ASSEMBLY TYPE:** 1. Load should be applied to the face with the screw head.  
2. When applying loads on both faces of multiple lumber beams, screws shall be installed on both sides with 1" offset for rows on the opposite face.



## FASTENING PATTERN:

**Side-Loaded Beams**, floor joists are applied to the side of the beam typically using joist hangers. *Table 1* and *Table 2* must be used to establish proper fastening patterns based on **design loads as determined by a licensed design professional** and noted on the plans.

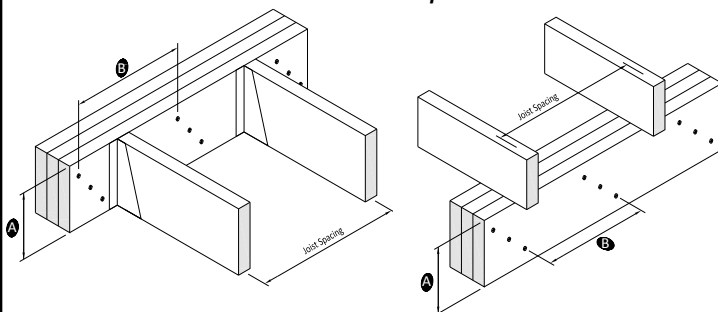
- Allowable loads for each of the Big Timber® Construction Fasteners are based on ICC-ES Report ESR-3534.
- A specific gravity of .5 was used for all calculations.
- The uniform loads in *Table 1* and *Table 2* relate only to the capacity of each fastener to transfer shear loads between plies.
- Screw capacities are designed at 100% stress level. **A design professional** may apply adjustment factors to increase or decrease these loads per National Design Specification for wood construction (NDS) and permissible by code.
- Beams with unequal side loads applied on opposite faces may undergo torsion when loaded. **Consult a licensed design professional** about the affects of torsion on multiple lumber beams.
- The values from *Table 1* and *Table 2* assume that the fasteners are properly installed per the instructions on this bulletin.
- A licensed design professional should always be consulted for critical assemblies, sizing, and fastening requirements of the multiple lumber beams and design of the joist hangers/brackets.**

**Top-Loaded Beams**, where all floor joists sit on the beam.

- Load must be applied evenly across entire beam.
- Selected Big Timber® Construction Fasteners shall be sized to penetrate all plies with embedment requirements.
- For beams with 4 or more plies, install screws on both faces with 1" offset between rows on opposite faces.

**Side-Loaded Beams**

**Top-Loaded Beams**



**A** Beam Depth: screw type & spacing per *Table 1* and *Table 2*  
**B** Screw Spacing: 12"/16"/24" O.C. Max

**TABLE 1**

1. Applied load from joist are assumed to be uniform.  
2. Fastener capacity is based on fastener spacing, not joist spacing.

Fastener Designation	No. of Screws	Spacing Between Rows (inches)	Allowable Side Loads by Assembly Type							
			A	B	C	D	E	F		
CTX #14	#14x2 1/2"	2	24	178						
		2	16	268						
		2	12	446						
		3	24	268						
		3	16	402						
		3	12	670						
	#14x3"	2	24	178						
		2	16	268						
		2	12	446						
		3	24	268						
		3	16	402						
		3	12	670						
	#14x4"	2	24	178	227			178		
		2	16	268	343			268		
		2	12	446	570			446		
		3	24	268	343			268		
		3	16	402	514			402		
		3	12	670	857			670		
	#14x5"	2	24	178	329			218	218	
		2	16	268	495			327	327	
		2	12	446	825			546	546	
		3	24	268	495			327	327	
		3	16	402	743			491	491	
		3	12	670	1239			819	819	
#14x6"	2	24	178	356	431	218	154	310		
	2	16	268	535	647	327	232	465		
	2	12	446	892	1079	546	387	775		
	3	24	268	536	648	327	232	464		
	3	16	402	804	972	491	348	687		
	3	12	670	1340	1621	819	581	1162		
CTX #15	#15x3"	2	24	283				88		
		2	16	424				151		
		2	12	708				252		
		3	24	424				148		
		3	16	637				223		
		3	12	1062				371		
	#15x3 1/2"	2	24	283				141		
		2	16	424				212		
		2	12	708				354		
		3	24	424				212		
		3	16	637				318		
		3	12	1062				531		
	#15x4"	2	24	283	362			181		
		2	16	424	542			271		
		2	12	708	906			453		
		3	24	424	542			271		
		3	16	637	815			407		
		3	12	1062	1359			679		
	#15x5"	2	24	283	523			141	118	
		2	16	424	784			424	178	
		2	12	708	1309			708	297	
		3	24	424	784			424	178	
		3	16	637	1178			637	267	
		3	12	1062	1964			1062	446	
#15x6"	2	24	283	566	685		283	283		
	2	16	424	848	1028	424	424	424		
	2	12	708	1416	1713	708	708	708		
	3	24	424	849	1028	424	424	424		
	3	16	637	1274	1542	637	637	637		
	3	12	1062	2124	2570	1062	1062	1062		

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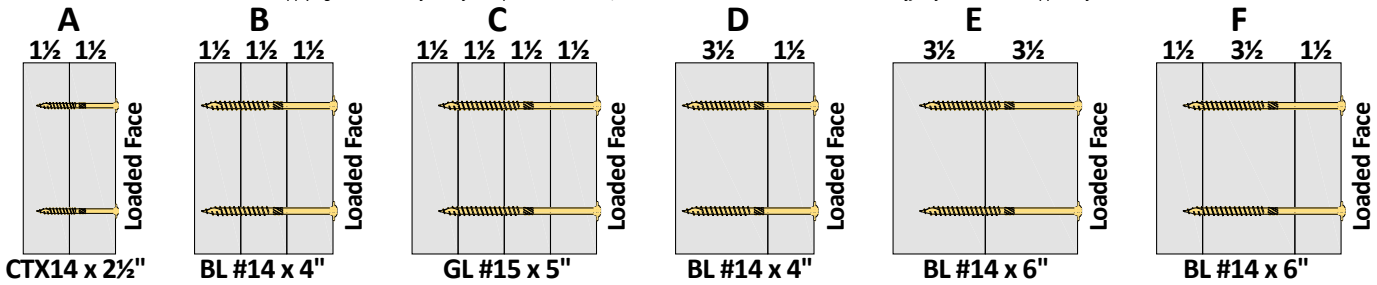
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**FASTENING PATTERN:**

For full fastening pattern guidelines see page 2 of this bulletin.

**Side-Loaded Beams**, floor joists are applied to the side of the beam typically using joist hangers. *Table 1* and *Table 2* must be used to establish proper fastening patterns based on **design loads as determined by a licensed design professional** and noted on the plans.

- Allowable loads for each of the Big Timber® Construction Fasteners are based on ICC-ES Report ESR-3534.
- The values from *Table 1* and *Table 2* assume that the fasteners are properly installed per the instructions on this bulletin.
- **A licensed design professional should always be consulted for critical assemblies, sizing, and fastening requirements of the multiple lumber beams and design of the joist hangers/brackets.**

**Top-Loaded Beams**, where all floor joists sit on the beam.

- Load must be applied evenly across entire beam.
- Selected Big Timber® Construction Fasteners shall be sized to penetrate all plies with embedment requirements.
- For beams with 4 or more plies, install screws on both faces with 1" offset between rows on opposite faces.

**TABLE 2**

1. Applied load from joist are assumed to be uniform.  
2. Fastener capacity is based on fastener spacing, not joist spacing.

Fastener Designation	No. of Screws	Spacing Between Rows (inches)	Allowable Side Loads by Assembly Type						
			A	B	C	D	E	F	
BL "Black Log"	#14x4"	2	24	208	266		208	208	
		2	16	312	399		312	312	
		2	12	520	665		520	520	
	#14x6"	3	24	312	399		312	312	
		3	16	468	599		468	468	
		3	12	780	998		780	780	
	#14x8"	2	24	208	416		208	208	520
		2	16	312	624		312	312	780
		2	12	520	1040		520	520	1300
	#14x10"	3	24	312	624		312	312	780
		3	16	468	936		468	468	1170
		3	12	780	1560		780	780	1950
#14x12"	2	24	208	416	624	208	208	416	
	2	16	312	624	936	312	312	624	
	2	12	520	1040	1560	520	520	1040	
#14x14"	3	24	312	624	936	312	312	624	
	3	16	468	936	1404	468	468	936	
	3	12	780	1560	2340	780	780	1560	
GL "Grey Log"	#17x5"	2	24	208	416	624	208	208	416
		2	16	312	624	936	312	312	624
		2	12	520	1040	1560	520	520	1040
	#17x7"	3	24	312	624	936	312	312	624
		3	16	468	936	1404	468	468	936
		3	12	780	1560	2340	780	780	1560
	#17x9"	2	24	208	416	624	208	208	416
		2	16	312	624	936	312	312	624
		2	12	520	1040	1560	520	520	1040
	#17x11"	3	24	312	624	936	312	312	624
		3	16	468	936	1404	468	468	936
		3	12	780	1560	2340	780	780	1560

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			A	B	C	D	E	F	
CTX #17	#17x7"	2	24	355	710	1065	355	355	710
		2	16	532	1065	1598	532	532	1065
		2	12	888	1776	2664	888	888	1776
	#17x8"	3	24	532	1065	1598	532	532	1065
		3	16	799	1598	2397	799	799	1598
		3	12	1332	2664	3996	1332	1332	2664
	#17x10"	2	24	355	710	1065	355	355	710
		2	16	532	1065	1598	532	532	1065
		2	12	888	1776	2664	888	888	1776
	#17x12"	3	24	532	1065	1598	532	532	1065
		3	16	799	1598	2397	799	799	1598
		3	12	1332	2664	3996	1332	1332	2664

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