Code Compliance Research Report CCRR-0186

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1. Subject

Trex Elevations

2. Research Scope

2.1 Building Codes:

2009 International Building Code (IBC)

2009 International Residential Code (IRC)

2.2 Properties:

Structural Performance

3. Description

3.1 General – *Trex Elevations* is a steel framing system used for the substructure of an exterior deck.

3.2 Materials and Processes – *Trex Elevations* is an assemblage of cold-formed steel components installed with metal hangers and fasteners.

3.2.1 Steel 1-5/8 inch joists are manufactured from galvanized G60 18 gauge Structural Steel Grade 33 in accordance with ASTM A653/A653M, including 2 levels of proprietary, exterior grade, baked on coating. See Figure 3 for nominal section profile.

3.2.2 Steel 2 inch joists and 1-1/4 inch tracks are manufactured from galvanized G60 14 gauge Structural Steel Grade 50 Class 1 in accordance with ASTM A653/A653M, including 2 levels of proprietary, exterior grade, baked on coating. See Figures 3 and 4 for nominal section profiles.

3.2.3 Single box beams consist of one 2 inch joist and one 1-1/4 inch track. The joist and track components are factory assembled with .100" dia. zinc-plated helical pins pneumatically driven into the top and bottom flange at 12 inches on center. See Figure 5 for nominal section profile.

3.2.4 A double box beam is field- assembled with 2 single box beams fastened together through the webs with 1/2 inch diameter, 5 inch long carriage style bolts staggered at 24 inches on center. See Figure 5 for nominal section profile.

4. Performance Characteristics

4.1 Allowable maximum spans for 1-5/8 inch joists, single box beams and double box beams are given in Tables 1 thru 6 with respect to joist spacing of 12 or 16 inches. See Figures 1 and 2 for definition of joist span, cantilever length and box beam span.

4.2 *Trex Elevations* steel deck framing system is designed to resist a concentrated load as described in IRC Table R301.5 for up to 36 inch high rail posts.

5. Installation

Installation shall be in accordance with the manufacturer's installation instructions and this report. Where differences occur between this report and the manufacturer's installation instructions, this report shall govern.

5.1 Joists may bear on top flange of box beam (dropped beam construction) or joists may be fastened to face of box beam (flush beam construction). Double box beams are used in dropped beam construction only. See Table 7 and Figures 7, 8 and 10 for installation details.

5.2 Joist blocking is required every other bay above dropped beams for all joist spans and every bay at joist midspan for joist spans greater than 8 feet. Joist blocking members are fabricated from 1-5/8 inch joists. All joist blocking shall be installed with angle brackets. See Figure 6 for blocking details.

5.3 Splicing of joists and box beams is outside the scope of this report.

5.4 See Table 7 for metal to metal component fastening schedule.

5.5 See Table 10 for approved Trex Elevations fasteners.

5.6 Box beams are attached to un-notched wood support posts as illustrated in Figures 7, 8 and 10 using Simpson Strong-Tie AC4, AC6, LPC4 or LPC6 post brackets, as recognized in ICC-ES Evaluation Report, ESR-2604. Wood support posts are outside the scope of this report.

5.7 Single box beams may be attached to notched wood support posts as illustrated in Figure 10. The wood support posts shall have a specific gravity of 0.50 or greater (Douglas Fir-Larch or better). Wood support posts are outside the scope of this report. See Table 8 for installation details.

5.8 Rail posts are attached to steel deck framing system as illustrated in Figure 11.

5.9 1-5/8 inch joists are attached to continuous track/ledger as illustrated in Figure 9.

5.10 1-5/8 inch joists are attached to continuous track (front plate) as illustrated in Figure 9.

5.11 Continuous track/ledger may be attached to existing 2 inch nominal lumber band joist with 3/8 inch diameter lag bolts. The existing band joist shall have a specific gravity of 0.55 or greater (Southern Pine or better). See Table 9 for continuous track/ledger fastening schedule.

5.12 Deck framing anchorage for lateral load shall comply with IRC Sections R502.2.2 and R502.2.2.3, and IBC Section 1604.8.3. See Paragraph 7.3

5.13 Deck boards shall be positively fastened to each joist.

6. Supporting Evidence

6.1 Manufacturer's drawings and installation instructions.

6.2 Reports of engineering analysis in accordance with ICC-ES AC46, Acceptance Criteria for Cold-Formed Steel Framing Members, approved February 2011.

6.3 Reports of testing and engineering analysis in accordance with AISI S100-2007, North American Specification for the Design of Cold-Formed Steel Structural Members.

6.4 Quality control manual demonstrating compliance with ICC-ES AC10, Acceptance Criteria for Quality Documentation, approved June 2011.

7. Conditions of Use

Trex Elevations, identified in this report, is deemed to comply with the intent of the provisions of the referenced building codes subject to the following conditions:

7.1 Fasteners for steel-to-steel connections shall be self-drilling tapping screws conforming to ASTM C1513, installed with an edge distance and center-to-center spacing of no less than 1/2 inches. Screws shall extend through the steel a minimum of three exposed threads.

7.2 Adequate joist top flange bracing to preclude lateral-torsional buckling shall be demonstrated to the building official's satisfaction.

7.3 Additional design and construction are required for anchorage of lateral loads to the primary framing in accordance with IRC Sections R502.2.2 and R502.2.2.3, and IBC Section 1604.8.3.

7.4 *Trex Elevations* steel framing system shall be limited to sites subjected to a maximum design wind speed of 150 mph, Exposure C, and a maximum design snow load of 150 psf.

7.5 Stair construction details are not within the scope of this report.

7.6 2 inch joists and 1-1/4 inch tracks have not been evaluated for use as individual joists.

7.7 Conventional wood supports for guards and substructure steel framing system are not within the scope of this report and are subject to evaluation and approval by the building official. Supports must satisfy the design load requirements specified in Chapter 16 of the IBC and must provide suitable material for anchorage. Where required by the building official, engineering calculations and details shall be provided.

7.8 Compatibility of fasteners and other metallic components with wood supports for guards and substructure steel framing system, including chemically treated wood, is not within the scope of this report.

7.9 Perforations of webs and flanges of joists and box beams are outside the scope of this report.

7.10 Wind uplift capacity of the deck boards and deck board fasteners shall be demonstrated to the building official's satisfaction.

7.11 *Trex Elevations* must be installed in accordance with this report, the applicable building code and the manufacturer's installation instructions. Where differences occur between this report and the manufacturer's installation instructions, this report shall govern.

7.12 Design of connections shall be by a qualified engineer in accordance with the referenced codes. Where required by the building official, engineering calculations shall verify that the anchorage complies with the building code for the type of framing and condition of the supporting construction.

7.13 *Trex Elevations* is manufactured in Winchester, Virginia and Fernley, Nevada in accordance with the manufacturer's approved quality control system with inspections by PFS Corporation (IAS AA-652).

8. Identification

Trex Elevations components produced in accordance with this report shall be identified with a legible label, stencil, stamp or embossment, at a maximum of 96 inches on center, with the following information:

8.1 Manufacturer's identification

8.2 The material minimum base steel thickness

8.3 Minimum coating designation (G60)

8.4 Two additional levels of baked on exterior coating

8.5 Minimum yield strength

8.6 The Architectural Testing Code Compliance Research Report number (ATI-CCRR-0186)

8.7 The bundle label shall include the mark of the independent inspection agency, PFS Corp. (IAS AA-652).

8.8 The bundle label shall include the Architectural Testing Code Compliance Research Report mark.

9. Code Compliance Research Report Use

9.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

9.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Architectural Testing.

9.3 Reference to the Architectural Testing internet web site address at www.ati-es.com is recommended to ascertain the current version and status of this report.

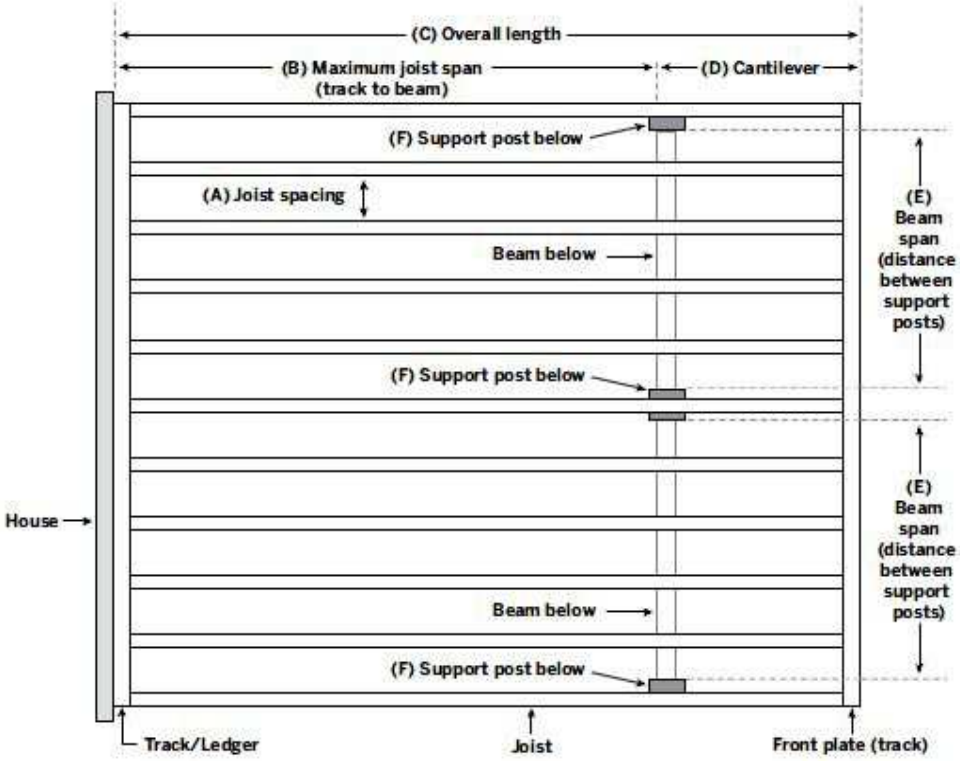


Figure 1 – Single Beam Plan

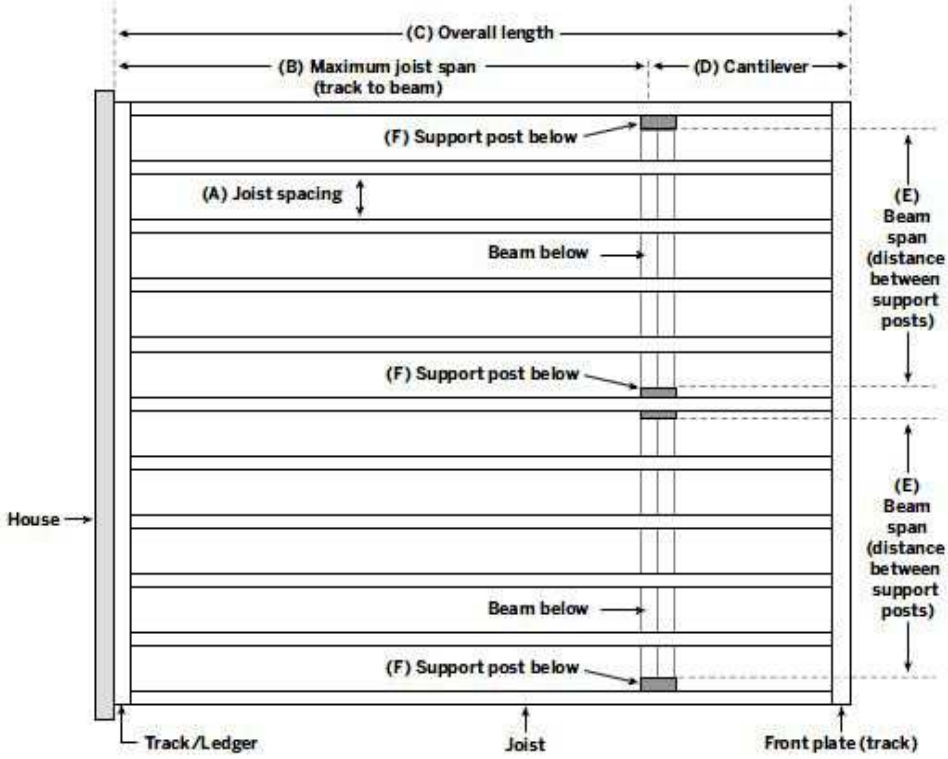


Figure 2 – Double Beam Plan

Table 1 – 50 PSF Span Chart - Residential

Table Instructions:	Enter the table with a joist span and cantilever length, then read the maximum allowable box beam span.

JOIST SPAN LIMITS (FEET / CENTIMETERS)					
12" JOIST SPACING O.C.			16" JOIST SPACING O.C.		
MAXIMUM JOIST SPAN (LEDGER TO BOX BEAM)	15' - 0"	457.2 cm	MAXIMUM JOIST SPAN (LEDGER TO BOX BEAM)	13' - 0"	396.2 cm
MAXIMUM CANTILEVER LENGTH	4' - 0"	121.9 cm	MAXIMUM CANTILEVER LENGTH	4' - 0"	121.9 cm
(Single Trex 1 5/8" Joist)			(Single Trex 1 5/8" Joist)		

MAXIMUM BOX BEAM SPAN (SINGLE BOX BEAM BETWEEN POSTS)

		JOIST SPAN (LEDGER TO BOX BEAM) (FEET / CENTIMETERS)															
		0' - 0" 0.0	1' - 0" 30.5	2' - 0" 61.0	3' - 0" 91.4	4' - 0" 121.9	5' - 0" 152.4	6' - 0" 182.9	7' - 0" 213.4	8' - 0" 243.8	9' - 0" 274.3	10' - 0" 304.8	11' - 0" 335.3	12' - 0" 365.8	13' - 0" 396.2	14' - 0" 426.7	15' - 0" 457.2
CANTILEVER LENGTH (FEET/CENTIMET	0' - 0" 0.0		29' - 9" 908.0	23' - 8" 720.7	20' - 8" 629.6	18' - 9" 572.0	17' - 5" 531.0	16' - 5" 499.7	15' - 7" 474.7	14' - 11" 454.0	14' - 4" 436.5	13' - 10" 421.5	13' - 5" 408.3	13' - 0" 396.6	12' - 8" 386.2	12' - 4" 376.8	12' - 1" 368.2
	0' - 6" 15.2		23' - 8" 720.7	20' - 8" 629.6	18' - 9" 572.0	17' - 5" 531.0	16' - 5" 499.7	15' - 7" 474.7	14' - 11" 454.0	14' - 4" 436.5	13' - 10" 421.5	13' - 5" 408.3	13' - 0" 396.6	12' - 8" 386.2	12' - 4" 376.8	12' - 1" 368.2	11' - 10" 360.4
	1' - 0" 30.5			18' - 9" 572.0	17' - 5" 531.0	16' - 5" 499.7	15' - 7" 474.7	14' - 11" 454.0	14' - 4" 436.5	13' - 10" 421.5	13' - 5" 408.3	13' - 0" 396.6	12' - 8" 386.2	12' - 4" 376.8	12' - 1" 368.2	11' - 10" 360.4	11' - 7" 353.1
	1' - 6" 45.7				16' - 5" 499.7	15' - 7" 474.7	14' - 11" 454.0	14' - 4" 436.5	13' - 10" 421.5	13' - 5" 408.3	13' - 0" 396.6	12' - 8" 386.2	12' - 4" 376.8	12' - 1" 368.2	11' - 10" 360.4	11' - 7" 353.1	11' - 4" 344.6
	2' - 0" 61.0					14' - 11" 454.0	14' - 4" 436.5	13' - 10" 421.5	13' - 5" 408.3	13' - 0" 396.6	12' - 8" 386.2	12' - 4" 376.8	12' - 1" 368.2	11' - 10" 360.4	11' - 7" 353.1	11' - 4" 344.6	11' - 0" 335.4
	2' - 6" 76.2						13' - 10" 421.5	13' - 5" 408.3	13' - 0" 396.6	12' - 8" 386.2	12' - 4" 376.8	12' - 1" 368.2	11' - 10" 360.4	11' - 7" 353.1	11' - 4" 344.6	11' - 0" 335.4	10' - 9" 326.9
	3' - 0" 91.4							13' - 0" 396.6	12' - 8" 386.2	12' - 4" 376.8	12' - 1" 368.2	11' - 10" 360.4	11' - 7" 353.1	11' - 4" 344.6	11' - 0" 335.4	10' - 9" 326.9	10' - 6" 319.0
	3' - 6" 106.7								12' - 4" 376.8	12' - 1" 368.2	11' - 10" 360.4	11' - 7" 353.1	11' - 4" 344.6	11' - 0" 335.4	10' - 9" 326.9	10' - 6" 319.0	10' - 3" 311.7
	4' - 0" 121.9									11' - 10" 360.4	11' - 7" 353.1	11' - 4" 344.6	11' - 0" 335.4	10' - 9" 326.9	10' - 6" 319.0	10' - 3" 311.7	10' - 0" 304.8

Table 1 – 50 PSF Span Chart – Residential (continued)

MAXIMUM BOX BEAM SPAN (DOUBLE BOX BEAM BETWEEN POSTS)

CANTILEVER LENGTH (FEET/CENTIMETERS)	JOIST SPAN (LEDGER TO BOX BEAM) (FEET / CENTIMETERS)															
	0' - 0" 0.0	1' - 0" 30.5	2' - 0" 61.0	3' - 0" 91.4	4' - 0" 121.9	5' - 0" 152.4	6' - 0" 182.9	7' - 0" 213.4	8' - 0" 243.8	9' - 0" 274.3	10' - 0" 304.8	11' - 0" 335.3	12' - 0" 365.8	13' - 0" 396.2	14' - 0" 426.7	15' - 0" 457.2
0' - 0" 0.0		37' - 6" 1144.1	29' - 9" 908.0	26' - 0" 793.2	23' - 8" 720.7	21' - 11" 669.1	20' - 8" 629.6	19' - 7" 598.1	18' - 9" 572.0	18' - 1" 550.0	17' - 5" 531.0	16' - 11" 514.4	16' - 5" 499.7	16' - 0" 486.6	15' - 7" 474.7	15' - 3" 463.9
0' - 6" 15.2		29' - 9" 908.0	26' - 0" 793.2	23' - 8" 720.7	21' - 11" 669.1	20' - 8" 629.6	19' - 7" 598.1	18' - 9" 572.0	18' - 1" 550.0	17' - 5" 531.0	16' - 11" 514.4	16' - 5" 499.7	16' - 0" 486.6	15' - 7" 474.7	15' - 3" 463.9	14' - 11" 454.0
1' - 0" 30.5			23' - 8" 720.7	21' - 11" 669.1	20' - 8" 629.6	19' - 7" 598.1	18' - 9" 572.0	18' - 1" 550.0	17' - 5" 531.0	16' - 11" 514.4	16' - 5" 499.7	16' - 0" 486.6	15' - 7" 474.7	15' - 3" 463.9	14' - 11" 454.0	14' - 7" 444.9
1' - 6" 45.7				20' - 8" 629.6	19' - 7" 598.1	18' - 9" 572.0	18' - 1" 550.0	17' - 5" 531.0	16' - 11" 514.4	16' - 5" 499.7	16' - 0" 486.6	15' - 7" 474.7	15' - 3" 463.9	14' - 11" 454.0	14' - 7" 444.9	14' - 4" 436.5
2' - 0" 61.0					18' - 9" 572.0	18' - 1" 550.0	17' - 5" 531.0	16' - 11" 514.4	16' - 5" 499.7	16' - 0" 486.6	15' - 7" 474.7	15' - 3" 463.9	14' - 11" 454.0	14' - 7" 444.9	14' - 4" 436.5	14' - 1" 428.7
2' - 6" 76.2						17' - 5" 531.0	16' - 11" 514.4	16' - 5" 499.7	16' - 0" 486.6	15' - 7" 474.7	15' - 3" 463.9	14' - 11" 454.0	14' - 7" 444.9	14' - 4" 436.5	14' - 1" 428.7	13' - 10" 421.5
3' - 0" 91.4							16' - 5" 499.7	16' - 0" 486.6	15' - 7" 474.7	15' - 3" 463.9	14' - 11" 454.0	14' - 7" 444.9	14' - 4" 436.5	14' - 1" 428.7	13' - 10" 421.5	13' - 7" 414.7
3' - 6" 106.7								15' - 7" 474.7	15' - 3" 463.9	14' - 11" 454.0	14' - 7" 444.9	14' - 4" 436.5	14' - 1" 428.7	13' - 10" 421.5	13' - 7" 414.7	13' - 5" 408.3
4' - 0" 121.9									14' - 11" 454.0	14' - 7" 444.9	14' - 4" 436.5	14' - 1" 428.7	13' - 10" 421.5	13' - 7" 414.7	13' - 5" 408.3	13' - 2" 402.3

NOTES:

1. All loads and load combinations are determined using ASCE 7-05. DL=Dead Load, LL=Live Load, SL=Snow Load.
   When LL<SL, the total load (TL) is 1.2DL+1.6SL+0.5LL, otherwise TL=1.2DL+1.6LL+0.5SL.
2. Loads used to produce the tables above are as follows: DL=10psf, LL=40psf, SL=0psf.
3. Deflection limits for joists are determined using IBC-2009 Section R505, Steel Floor Framing.
   Joists - Live load deflection is limited to L/480, total deflection is limited to L/240, where L is the span length.
   Box Beams - Live load deflection is limited to L/360, total deflection is limited to L/240, where L is the span length.
4. Grey areas in tables indicate instances where the joists do not backspan twice the cantilever distance or where the maximum joist span is exceeded.
5. Grey areas are established based on 12 in. O.C. joist capacity.
6. A partial list of section properties for each member is provided in the Trex Elevations Deck Framing / Inspection Details Table.
7. Joist and box beam capacity are determined with AISI-S100-07 (LRFD).
8. Joist yield stress is assumed as 33ksi.
9. Box beam yield stress is assumed as 50ksi.
10. If a box beam is supported by more than two posts, then its span selected above should be multiplied by 0.85 for a single box beam and 0.90 for a double box beam.
11. If a box beam is provided as an intermediate joist support, then its span selected above or modified by Note 10 should be multiplied by 0.60 for a "dropped" box beam and 0.70 for a "flush" box beam.
12. This span chart should not be used for decks located in a hurricane zone (minimum load of 125 psf should be considered in hurricane zones).

Table 2 – 75 PSF Span Chart - Residential

Table Instructions:	Enter the table with a joist span and cantilever length, then read the maximum allowable box beam span.

JOIST SPAN LIMITS (FEET / CENTIMETERS)					
12" JOIST SPACING O.C.			16" JOIST SPACING O.C.		
MAXIMUM JOIST SPAN (LEDGER TO BOX BEAM)	14' - 0"	426.7 cm	MAXIMUM JOIST SPAN (LEDGER TO BOX BEAM)	12' - 0"	365.8 cm
MAXIMUM CANTILEVER LENGTH	4' - 0"	121.9 cm	MAXIMUM CANTILEVER LENGTH	4' - 0"	121.9 cm
(Single Trex 1 5/8" Joist)			(Single Trex 1 5/8" Joist)		

MAXIMUM BOX BEAM SPAN (SINGLE BOX BEAM BETWEEN POSTS)

CANTILEVER LENGTH (FEET/CENTIMETERS)	JOIST SPAN (LEDGER TO BOX BEAM) (FEET / CENTIMETERS)															
	0' - 0" 0.0	1' - 0" 30.5	2' - 0" 61.0	3' - 0" 91.4	4' - 0" 121.9	5' - 0" 152.4	6' - 0" 182.9	7' - 0" 213.4	8' - 0" 243.8	9' - 0" 274.3	10' - 0" 304.8	11' - 0" 335.3	12' - 0" 365.8	13' - 0" 396.2	14' - 0" 426.7	15' - 0" 457.2
0' - 0" 0.0		27' - 8" 843.0	21' - 11" 669.1	19' - 2" 584.5	17' - 5" 531.0	16' - 2" 493.0	15' - 3" 463.9	14' - 5" 440.7	13' - 10" 421.5	13' - 4" 405.2	12' - 10" 391.3	12' - 5" 379.0	12' - 1" 368.2	11' - 9" 358.5	11' - 6" 349.8	
0' - 6" 15.2		21' - 11" 669.1	19' - 2" 584.5	17' - 5" 531.0	16' - 2" 493.0	15' - 3" 463.9	14' - 5" 440.7	13' - 10" 421.5	13' - 4" 405.2	12' - 10" 391.3	12' - 5" 379.0	12' - 1" 368.2	11' - 9" 358.5	11' - 6" 349.8	11' - 3" 341.8	
1' - 0" 30.5			17' - 5" 531.0	16' - 2" 493.0	15' - 3" 463.9	14' - 5" 440.7	13' - 10" 421.5	13' - 4" 405.2	12' - 10" 391.3	12' - 5" 379.0	12' - 1" 368.2	11' - 9" 358.5	11' - 6" 349.8	11' - 3" 341.8	11' - 0" 334.5	
1' - 6" 45.7				15' - 3" 463.9	14' - 5" 440.7	13' - 10" 421.5	13' - 4" 405.2	12' - 10" 391.3	12' - 5" 379.0	12' - 1" 368.2	11' - 9" 358.5	11' - 6" 349.8	11' - 3" 341.8	11' - 0" 334.5	10' - 9" 327.8	
2' - 0" 61.0					13' - 10" 421.5	13' - 4" 405.2	12' - 10" 391.3	12' - 5" 379.0	12' - 1" 368.2	11' - 9" 358.5	11' - 6" 349.8	11' - 3" 341.8	11' - 0" 334.5	10' - 9" 327.8	10' - 6" 319.3	
2' - 6" 76.2						12' - 10" 391.3	12' - 5" 379.0	12' - 1" 368.2	11' - 9" 358.5	11' - 6" 349.8	11' - 3" 341.8	11' - 0" 334.5	10' - 9" 327.8	10' - 6" 319.3	10' - 2" 310.8	
3' - 0" 91.4							12' - 1" 368.2	11' - 9" 358.5	11' - 6" 349.8	11' - 3" 341.8	11' - 0" 334.5	10' - 9" 327.8	10' - 6" 319.3	10' - 2" 310.8	9' - 11" 302.9	
3' - 6" 106.7								11' - 6" 349.8	11' - 3" 341.8	11' - 0" 334.5	10' - 9" 327.8	10' - 6" 319.3	10' - 2" 310.8	9' - 11" 302.9	9' - 8" 295.6	
4' - 0" 121.9									11' - 0" 334.5	10' - 9" 327.8	10' - 6" 319.3	10' - 2" 310.8	9' - 11" 302.9	9' - 8" 295.6	9' - 6" 288.8	

Table 2 – 75 PSF Span Chart – Residential (continued)

MAXIMUM BOX BEAM SPAN (DOUBLE BOX BEAM BETWEEN POSTS)

CANTILEVER LENGTH (FEET/CENTIMETERS)	JOIST SPAN (LEDGER TO BOX BEAM) (FEET / CENTIMETERS)														
	0' - 0" 0.0	1' - 0" 30.5	2' - 0" 61.0	3' - 0" 91.4	4' - 0" 121.9	5' - 0" 152.4	6' - 0" 182.9	7' - 0" 213.4	8' - 0" 243.8	9' - 0" 274.3	10' - 0" 304.8	11' - 0" 335.3	12' - 0" 365.8	13' - 0" 396.2	14' - 0" 426.7	15' - 0" 457.2
0' - 0" 0.0		34' - 10" 1062.1	27' - 8" 843.0	24' - 2" 736.4	21' - 11" 669.1	20' - 5" 621.1	19' - 2" 584.5	18' - 3" 555.2	17' - 5" 531.0	16' - 9" 510.6	16' - 2" 493.0	15' - 8" 477.5	15' - 3" 463.9	14' - 10" 451.7	14' - 5" 440.7	
0' - 6" 15.2		27' - 8" 843.0	24' - 2" 736.4	21' - 11" 669.1	20' - 5" 621.1	19' - 2" 584.5	18' - 3" 555.2	17' - 5" 531.0	16' - 9" 510.6	16' - 2" 493.0	15' - 8" 477.5	15' - 3" 463.9	14' - 10" 451.7	14' - 5" 440.7	14' - 2" 430.6	
1' - 0" 30.5			21' - 11" 669.1	20' - 5" 621.1	19' - 2" 584.5	18' - 3" 555.2	17' - 5" 531.0	16' - 9" 510.6	16' - 2" 493.0	15' - 8" 477.5	15' - 3" 463.9	14' - 10" 451.7	14' - 5" 440.7	14' - 2" 430.6	13' - 10" 421.5	
1' - 6" 45.7				19' - 2" 584.5	18' - 3" 555.2	17' - 5" 531.0	16' - 9" 510.6	16' - 2" 493.0	15' - 8" 477.5	15' - 3" 463.9	14' - 10" 451.7	14' - 5" 440.7	14' - 2" 430.6	13' - 10" 421.5	13' - 7" 413.0	
2' - 0" 61.0					17' - 5" 531.0	16' - 9" 510.6	16' - 2" 493.0	15' - 8" 477.5	15' - 3" 463.9	14' - 10" 451.7	14' - 5" 440.7	14' - 2" 430.6	13' - 10" 421.5	13' - 7" 413.0	13' - 4" 405.2	
2' - 6" 76.2						16' - 2" 493.0	15' - 8" 477.5	15' - 3" 463.9	14' - 10" 451.7	14' - 5" 440.7	14' - 2" 430.6	13' - 10" 421.5	13' - 7" 413.0	13' - 4" 405.2	13' - 1" 398.0	
3' - 0" 91.4							15' - 3" 463.9	14' - 10" 451.7	14' - 5" 440.7	14' - 2" 430.6	13' - 10" 421.5	13' - 7" 413.0	13' - 4" 405.2	13' - 1" 398.0	12' - 10" 391.3	
3' - 6" 106.7								14' - 5" 440.7	14' - 2" 430.6	13' - 10" 421.5	13' - 7" 413.0	13' - 4" 405.2	13' - 1" 398.0	12' - 10" 391.3	12' - 8" 385.0	
4' - 0" 121.9									13' - 10" 421.5	13' - 7" 413.0	13' - 4" 405.2	13' - 1" 398.0	12' - 10" 391.3	12' - 8" 385.0	12' - 5" 379.0	

NOTES:

1. All loads and load combinations are determined using ASCE 7-05. DL=Dead Load, LL=Live Load, SL=Snow Load.
   When LL<SL, the total load (TL) is 1.2DL+1.6SL+0.5LL, otherwise TL=1.2DL+1.6LL+0.5SL.
2. Loads used to produce the tables above are as follows: DL=10psf, LL=40psf, SL=25psf.
3. Deflection limits for joists are determined using IBC-2009 Section R505, Steel Floor Framing.
   Joists - Live load deflection is limited to L/480, total deflection is limited to L/240, where L is the span length.
   Box Beams - Live load deflection is limited to L/360, total deflection is limited to L/240, where L is the span length.
4. Grey areas in tables indicate instances where the joists do not backspan twice the cantilever distance or where the maximum joist span is exceeded.
5. Grey areas are established based on 12 in. O.C. joist capacity.
6. A partial list of section properties for each member is provided in the Trex Elevations Deck Framing / Inspection Details Table.
7. Joist and box beam capacity are determined with AISI-S100-07 (LRFD).
8. Joist yield stress is assumed as 33ksi.
9. Box beam yield stress is assumed as 50ksi.
10. If a box beam is supported by more than two posts, then its span selected above should be multiplied by 0.85 for a single box beam and 0.90 for a double box beam.
11. If a box beam is provided as an intermediate joist support, then its span selected above or modified by Note 10 should be multiplied by 0.60 for a "dropped" box beam and 0.70 for a "flush" box beam.
12. This span chart should not be used for decks located in a hurricane zone (minimum load of 125 psf should be considered in hurricane zones).

Table 3 – 100 PSF Span Chart - Residential

Table Instructions:	Enter the table with a joist span and cantilever length, then read the maximum allowable box beam span.

JOIST SPAN LIMITS (FEET / CENTIMETERS)					
12" JOIST SPACING O.C.			16" JOIST SPACING O.C.		
MAXIMUM JOIST SPAN (LEDGER TO BOX BEAM)	12' - 0"	365.8 cm	MAXIMUM JOIST SPAN (LEDGER TO BOX BEAM)	11' - 0"	335.3 cm
MAXIMUM CANTILEVER LENGTH	4' - 0"	121.9 cm	MAXIMUM CANTILEVER LENGTH	3' - 0"	91.4 cm
(Single Trex 1 5/8" Joist)			(Single Trex 1 5/8" Joist)		

MAXIMUM BOX BEAM SPAN (SINGLE BOX BEAM BETWEEN POSTS)

CANTILEVER LENGTH (FEET/CENTIMETERS)	JOIST SPAN (LEDGER TO BOX BEAM) (FEET / CENTIMETERS)															
	0' - 0" 0.0	1' - 0" 30.5	2' - 0" 61.0	3' - 0" 91.4	4' - 0" 121.9	5' - 0" 152.4	6' - 0" 182.9	7' - 0" 213.4	8' - 0" 243.8	9' - 0" 274.3	10' - 0" 304.8	11' - 0" 335.3	12' - 0" 365.8	13' - 0" 396.2	14' - 0" 426.7	15' - 0" 457.2
0' - 0" 0.0		25' - 2" 765.9	19' - 11" 607.9	17' - 5" 531.0	15' - 10" 482.5	14' - 8" 447.9	13' - 10" 421.5	13' - 2" 400.4	12' - 7" 382.9	12' - 1" 368.2	11' - 8" 355.5	11' - 4" 344.4	11' - 0" 334.5			
0' - 6" 15.2		19' - 11" 607.9	17' - 5" 531.0	15' - 10" 482.5	14' - 8" 447.9	13' - 10" 421.5	13' - 2" 400.4	12' - 7" 382.9	12' - 1" 368.2	11' - 8" 355.5	11' - 4" 344.4	11' - 0" 334.5	10' - 8" 325.7			
1' - 0" 30.5			15' - 10" 482.5	14' - 8" 447.9	13' - 10" 421.5	13' - 2" 400.4	12' - 7" 382.9	12' - 1" 368.2	11' - 8" 355.5	11' - 4" 344.4	11' - 0" 334.5	10' - 8" 325.7	10' - 5" 317.8			
1' - 6" 45.7				13' - 10" 421.5	13' - 2" 400.4	12' - 7" 382.9	12' - 1" 368.2	11' - 8" 355.5	11' - 4" 344.4	11' - 0" 334.5	10' - 8" 325.7	10' - 5" 317.8	10' - 2" 310.5			
2' - 0" 61.0					12' - 7" 382.9	12' - 1" 368.2	11' - 8" 355.5	11' - 4" 344.4	11' - 0" 334.5	10' - 8" 325.7	10' - 5" 317.8	10' - 2" 310.5	9' - 11" 301.1			
2' - 6" 76.2						11' - 8" 355.5	11' - 4" 344.4	11' - 0" 334.5	10' - 8" 325.7	10' - 5" 317.8	10' - 2" 310.5	9' - 11" 301.1	9' - 7" 292.1			
3' - 0" 91.4							11' - 0" 334.5	10' - 8" 325.7	10' - 5" 317.8	10' - 2" 310.5	9' - 11" 301.1	9' - 7" 292.1	9' - 4" 283.9			
3' - 6" 106.7								10' - 5" 317.8	10' - 2" 310.5	9' - 11" 301.1	9' - 7" 292.1	9' - 4" 283.9	9' - 1" 276.3			
4' - 0" 121.9									9' - 11" 301.1	9' - 7" 292.1	9' - 4" 283.9	9' - 1" 276.3	8' - 10" 269.3			

Table 3 – 100 PSF Span Chart – Residential (continued)

MAXIMUM BOX BEAM SPAN (DOUBLE BOX BEAM BETWEEN POSTS)

CANTILEVER LENGTH (FEET/CENTIMETERS)	JOIST SPAN (LEDGER TO BOX BEAM) (FEET / CENTIMETERS)															
	0' - 0" 0.0	1' - 0" 30.5	2' - 0" 61.0	3' - 0" 91.4	4' - 0" 121.9	5' - 0" 152.4	6' - 0" 182.9	7' - 0" 213.4	8' - 0" 243.8	9' - 0" 274.3	10' - 0" 304.8	11' - 0" 335.3	12' - 0" 365.8	13' - 0" 396.2	14' - 0" 426.7	15' - 0" 457.2
0' - 0" 0.0		31' - 8" 964.9	25' - 2" 765.9	21' - 11" 669.1	19' - 11" 607.9	18' - 6" 564.3	17' - 5" 531.0	16' - 7" 504.4	15' - 10" 482.5	15' - 3" 463.9	14' - 8" 447.9	14' - 3" 433.9	13' - 10" 421.5			
0' - 6" 15.2		25' - 2" 765.9	21' - 11" 669.1	19' - 11" 607.9	18' - 6" 564.3	17' - 5" 531.0	16' - 7" 504.4	15' - 10" 482.5	15' - 3" 463.9	14' - 8" 447.9	14' - 3" 433.9	13' - 10" 421.5	13' - 6" 410.4			
1' - 0" 30.5			19' - 11" 607.9	18' - 6" 564.3	17' - 5" 531.0	16' - 7" 504.4	15' - 10" 482.5	15' - 3" 463.9	14' - 8" 447.9	14' - 3" 433.9	13' - 10" 421.5	13' - 6" 410.4	13' - 2" 400.4			
1' - 6" 45.7				17' - 5" 531.0	16' - 7" 504.4	15' - 10" 482.5	15' - 3" 463.9	14' - 8" 447.9	14' - 3" 433.9	13' - 10" 421.5	13' - 6" 410.4	13' - 2" 400.4	12' - 10" 391.3			
2' - 0" 61.0					15' - 10" 482.5	15' - 3" 463.9	14' - 8" 447.9	14' - 3" 433.9	13' - 10" 421.5	13' - 6" 410.4	13' - 2" 400.4	12' - 10" 391.3	12' - 7" 382.9			
2' - 6" 76.2						14' - 8" 447.9	14' - 3" 433.9	13' - 10" 421.5	13' - 6" 410.4	13' - 2" 400.4	12' - 10" 391.3	12' - 7" 382.9	12' - 4" 375.3			
3' - 0" 91.4							13' - 10" 421.5	13' - 6" 410.4	13' - 2" 400.4	12' - 10" 391.3	12' - 7" 382.9	12' - 4" 375.3	12' - 1" 368.2			
3' - 6" 106.7								13' - 2" 400.4	12' - 10" 391.3	12' - 7" 382.9	12' - 4" 375.3	12' - 1" 368.2	11' - 10" 361.6			
4' - 0" 121.9									12' - 7" 382.9	12' - 4" 375.3	12' - 1" 368.2	11' - 10" 361.6	11' - 8" 355.5			

NOTES:

1. All loads and load combinations are determined using ASCE 7-05. DL=Dead Load, LL=Live Load, SL=Snow Load.
   When LL<SL, the total load (TL) is 1.2DL+1.6SL+0.5LL, otherwise TL=1.2DL+1.6LL+0.5SL.
2. Loads used to produce the tables above are as follows: DL=10psf, LL=40psf, SL=50psf.
3. Deflection limits for joists are determined using IBC-2009 Section R505, Steel Floor Framing.
   Joists - Live load deflection is limited to L/480, total deflection is limited to L/240, where L is the span length.
   Box Beams - Live load deflection is limited to L/360, total deflection is limited to L/240, where L is the span length.
4. Grey areas in tables indicate instances where the joists do not backspan twice the cantilever distance or where the maximum joist span is exceeded.
5. Grey areas are established based on 12 in. O.C. joist capacity.
6. A partial list of section properties for each member is provided in the Trex Elevations Deck Framing / Inspection Details Table.
7. Joist and box beam capacity are determined with AISI-S100-07 (LRFD).
8. Joist yield stress is assumed as 33ksi.
9. Box beam yield stress is assumed as 50ksi.
10. If a box beam is supported by more than two posts, then its span selected above should be multiplied by 0.85 for a single box beam and 0.90 for a double box beam.
11. If a box beam is provided as an intermediate joist support, then its span selected above or modified by Note 10 should be multiplied by 0.60 for a "dropped" box beam and 0.70 for a "flush" box beam.
12. This span chart should not be used for decks located in a hurricane zone (minimum load of 125 psf should be considered in hurricane zones).

Table 4 – 125 PSF Span Chart – Residential

Table Instructions:	Enter the table with a joist span and cantilever length, then read the maximum allowable box beam span.

JOIST SPAN LIMITS (FEET / CENTIMETERS)					
12" JOIST SPACING O.C.			16" JOIST SPACING O.C.		
MAXIMUM JOIST SPAN (LEDGER TO BOX BEAM)	10' - 0"	304.8 cm	MAXIMUM JOIST SPAN (LEDGER TO BOX BEAM)	9' - 0"	274.3 cm
MAXIMUM CANTILEVER LENGTH	3' - 0"	91.4 cm	MAXIMUM CANTILEVER LENGTH	2' - 0"	61.0 cm
(Single Trex 1 5/8" Joist)			(Single Trex 1 5/8" Joist)		

MAXIMUM BOX BEAM SPAN (SINGLE BOX BEAM BETWEEN POSTS)

CANTILEVER LENGTH (FEET/CENTIMETERS)	JOIST SPAN (LEDGER TO BOX BEAM) (FEET / CENTIMETERS)															
	0' - 0" 0.0	1' - 0" 30.5	2' - 0" 61.0	3' - 0" 91.4	4' - 0" 121.9	5' - 0" 152.4	6' - 0" 182.9	7' - 0" 213.4	8' - 0" 243.8	9' - 0" 274.3	10' - 0" 304.8	11' - 0" 335.3	12' - 0" 365.8	13' - 0" 396.2	14' - 0" 426.7	15' - 0" 457.2
0' - 0" 0.0		23' - 4" 711.0	18' - 6" 564.3	16' - 2" 493.0	14' - 8" 447.9	13' - 8" 415.8	12' - 10" 391.3	12' - 2" 371.7	11' - 8" 355.5	11' - 3" 341.8	10' - 9" 326.9					
0' - 6" 15.2		18' - 6" 564.3	16' - 2" 493.0	14' - 8" 447.9	13' - 8" 415.8	12' - 10" 391.3	12' - 2" 371.7	11' - 8" 355.5	11' - 3" 341.8	10' - 9" 326.9	10' - 3" 311.7					
1' - 0" 30.5			14' - 8" 447.9	13' - 8" 415.8	12' - 10" 391.3	12' - 2" 371.7	11' - 8" 355.5	11' - 3" 341.8	10' - 9" 326.9	10' - 3" 311.7	9' - 9" 298.4					
1' - 6" 45.7				12' - 10" 391.3	12' - 2" 371.7	11' - 8" 355.5	11' - 3" 341.8	10' - 9" 326.9	10' - 3" 311.7	9' - 9" 298.4	9' - 5" 286.7					
2' - 0" 61.0					11' - 8" 355.5	11' - 3" 341.8	10' - 9" 326.9	10' - 3" 311.7	9' - 9" 298.4	9' - 5" 286.7	9' - 1" 276.3					
2' - 6" 76.2						10' - 9" 326.9	10' - 3" 311.7	9' - 9" 298.4	9' - 5" 286.7	9' - 1" 276.3	8' - 9" 266.9					
3' - 0" 91.4							9' - 9" 298.4	9' - 5" 286.7	9' - 1" 276.3	8' - 9" 266.9	8' - 6" 258.4					
3' - 6" 106.7																
4' - 0" 121.9																

Table 4 – 125 PSF Span Chart – Residential (continued)

MAXIMUM BOX BEAM SPAN (DOUBLE BOX BEAM BETWEEN POSTS)

CANTILEVER LENGTH (FEET/CENTIMETERS)	JOIST SPAN (LEDGER TO BOX BEAM) (FEET / CENTIMETERS)															
	0' - 0" 0.0	1' - 0" 30.5	2' - 0" 61.0	3' - 0" 91.4	4' - 0" 121.9	5' - 0" 152.4	6' - 0" 182.9	7' - 0" 213.4	8' - 0" 243.8	9' - 0" 274.3	10' - 0" 304.8	11' - 0" 335.3	12' - 0" 365.8	13' - 0" 396.2	14' - 0" 426.7	15' - 0" 457.2
0' - 0" 0.0		29' - 5" 895.8	23' - 4" 711.0	20' - 5" 621.1	18' - 6" 564.3	17' - 2" 523.8	16' - 2" 493.0	15' - 4" 468.3	14' - 8" 447.9	14' - 2" 430.6	13' - 8" 415.8					
0' - 6" 15.2		23' - 4" 711.0	20' - 5" 621.1	18' - 6" 564.3	17' - 2" 523.8	16' - 2" 493.0	15' - 4" 468.3	14' - 8" 447.9	14' - 2" 430.6	13' - 8" 415.8	13' - 3" 402.8					
1' - 0" 30.5			18' - 6" 564.3	17' - 2" 523.8	16' - 2" 493.0	15' - 4" 468.3	14' - 8" 447.9	14' - 2" 430.6	13' - 8" 415.8	13' - 3" 402.8	12' - 10" 391.3					
1' - 6" 45.7				16' - 2" 493.0	15' - 4" 468.3	14' - 8" 447.9	14' - 2" 430.6	13' - 8" 415.8	13' - 3" 402.8	12' - 10" 391.3	12' - 6" 381.0					
2' - 0" 61.0					14' - 8" 447.9	14' - 2" 430.6	13' - 8" 415.8	13' - 3" 402.8	12' - 10" 391.3	12' - 6" 381.0	12' - 2" 371.7					
2' - 6" 76.2						13' - 8" 415.8	13' - 3" 402.8	12' - 10" 391.3	12' - 6" 381.0	12' - 2" 371.7	11' - 11" 363.2					
3' - 0" 91.4							12' - 10" 391.3	12' - 6" 381.0	12' - 2" 371.7	11' - 11" 363.2	11' - 8" 355.5					
3' - 6" 106.7																
4' - 0" 121.9																

NOTES:

1. All loads and load combinations are determined using ASCE 7-05. DL=Dead Load, LL=Live Load, SL=Snow Load.
   When LL<SL, the total load (TL) is 1.2DL+1.6SL+0.5LL, otherwise TL=1.2DL+1.6LL+0.5SL.
2. Loads used to produce the tables above are as follows: DL=10psf, LL=40psf, SL=75psf.
3. Deflection limits for joists are determined using IBC-2009 Section R505, Steel Floor Framing.
   Joists - Live load deflection is limited to L/480, total deflection is limited to L/240, where L is the span length.
   Box Beams - Live load deflection is limited to L/360, total deflection is limited to L/240, where L is the span length.
4. Grey areas in tables indicate instances where the joists do not backspan twice the cantilever distance or where the maximum joist span is exceeded.
5. Grey areas are established based on 12 in. O.C. joist capacity.
6. A partial list of section properties for each member is provided in the Trex Elevations Deck Framing / Inspection Details Table.
7. Joist and box beam capacity are determined with AISI-S100-07 (LRFD).
8. Joist yield stress is assumed as 33ksi.
9. Box beam yield stress is assumed as 50ksi.
10. If a box beam is supported by more than two posts, then its span selected above should be multiplied by 0.85 for a single box beam and 0.90 for a double box beam.
11. If a box beam is provided as an intermediate joist support, then its span selected above or modified by Note 10 should be multiplied by 0.60 for a "dropped" box beam and 0.70 for a "flush" box beam.

Table 5 – 150 PSF Span Chart – Residential

Table Instructions:	Enter the table with a joist span and cantilever length, then read the maximum allowable box beam span.

JOIST SPAN LIMITS (FEET / CENTIMETERS)					
12" JOIST SPACING O.C.			16" JOIST SPACING O.C.		
MAXIMUM JOIST SPAN (LEDGER TO BOX BEAM)	9' - 0"	274.3 cm	MAXIMUM JOIST SPAN (LEDGER TO BOX BEAM)	8' - 0"	243.8 cm
MAXIMUM CANTILEVER LENGTH	2' - 6"	76.2 cm	MAXIMUM CANTILEVER LENGTH	1' - 6"	45.7 cm
(Single Trex 1 5/8" Joist)			(Single Trex 1 5/8" Joist)		

MAXIMUM BOX BEAM SPAN (SINGLE BOX BEAM BETWEEN POSTS)

		JOIST SPAN (LEDGER TO BOX BEAM) (FEET / CENTIMETERS)															
		0' - 0" 0.0	1' - 0" 30.5	2' - 0" 61.0	3' - 0" 91.4	4' - 0" 121.9	5' - 0" 152.4	6' - 0" 182.9	7' - 0" 213.4	8' - 0" 243.8	9' - 0" 274.3	10' - 0" 304.8	11' - 0" 335.3	12' - 0" 365.8	13' - 0" 396.2	14' - 0" 426.7	15' - 0" 457.2
CANTILEVER LENGTH (FEET/CENTIME	0' - 0" 0.0		21' - 11" 669.1	17' - 5" 531.0	15' - 3" 463.9	13' - 10" 421.5	12' - 10" 391.3	12' - 1" 368.2	11' - 5" 347.7	10' - 8" 325.2	10' - 1" 306.6						
	0' - 6" 15.2		17' - 5" 531.0	15' - 3" 463.9	13' - 10" 421.5	12' - 10" 391.3	12' - 1" 368.2	11' - 5" 347.7	10' - 8" 325.2	10' - 1" 306.6	9' - 7" 290.9						
	1' - 0" 30.5			13' - 10" 421.5	12' - 10" 391.3	12' - 1" 368.2	11' - 5" 347.7	10' - 8" 325.2	10' - 1" 306.6	9' - 7" 290.9	9' - 1" 277.3						
	1' - 6" 45.7				12' - 1" 368.2	11' - 5" 347.7	10' - 8" 325.2	10' - 1" 306.6	9' - 7" 290.9	9' - 1" 277.3	8' - 9" 265.5						
	2' - 0" 61.0					10' - 8" 325.2	10' - 1" 306.6	9' - 7" 290.9	9' - 1" 277.3	8' - 9" 265.5	8' - 4" 255.1						
	2' - 6" 76.2						9' - 7" 290.9	9' - 1" 277.3	8' - 9" 265.5	8' - 4" 255.1	8' - 1" 245.8						
	3' - 0" 91.4																
	3' - 6" 106.7																
	4' - 0" 121.9																

Table 5 – 150 PSF Span Chart – Residential (continued)

MAXIMUM BOX BEAM SPAN (DOUBLE BOX BEAM BETWEEN POSTS)

CANTILEVER LENGTH (FEET/CENTIMETERS)	JOIST SPAN (LEDGER TO BOX BEAM) (FEET / CENTIMETERS)															
	0' - 0" 0.0	1' - 0" 30.5	2' - 0" 61.0	3' - 0" 91.4	4' - 0" 121.9	5' - 0" 152.4	6' - 0" 182.9	7' - 0" 213.4	8' - 0" 243.8	9' - 0" 274.3	10' - 0" 304.8	11' - 0" 335.3	12' - 0" 365.8	13' - 0" 396.2	14' - 0" 426.7	15' - 0" 457.2
0' - 0" 0.0		27' - 8" 843.0	21' - 11" 669.1	19' - 2" 584.5	17' - 5" 531.0	16' - 2" 493.0	15' - 3" 463.9	14' - 5" 440.7	13' - 10" 421.5	13' - 4" 405.2						
0' - 6" 15.2		21' - 11" 669.1	19' - 2" 584.5	17' - 5" 531.0	16' - 2" 493.0	15' - 3" 463.9	14' - 5" 440.7	13' - 10" 421.5	13' - 4" 405.2	12' - 10" 391.3						
1' - 0" 30.5			17' - 5" 531.0	16' - 2" 493.0	15' - 3" 463.9	14' - 5" 440.7	13' - 10" 421.5	13' - 4" 405.2	12' - 10" 391.3	12' - 5" 379.0						
1' - 6" 45.7				15' - 3" 463.9	14' - 5" 440.7	13' - 10" 421.5	13' - 4" 405.2	12' - 10" 391.3	12' - 5" 379.0	12' - 1" 368.2						
2' - 0" 61.0					13' - 10" 421.5	13' - 4" 405.2	12' - 10" 391.3	12' - 5" 379.0	12' - 1" 368.2	11' - 9" 358.5						
2' - 6" 76.2						12' - 10" 391.3	12' - 5" 379.0	12' - 1" 368.2	11' - 9" 358.5	11' - 4" 345.7						
3' - 0" 91.4																
3' - 6" 106.7																
4' - 0" 121.9																

NOTES:

1. All loads and load combinations are determined using ASCE 7-05. DL=Dead Load, LL=Live Load, SL=Snow Load.
   When LL<SL, the total load (TL) is 1.2DL+1.6SL+0.5LL, otherwise TL=1.2DL+1.6LL+0.5SL.
2. Loads used to produce the tables above are as follows: DL=10psf, LL=40psf, SL=100psf.
3. Deflection limits for joists are determined using IBC-2009 Section R505, Steel Floor Framing.
   Joists - Live load deflection is limited to L/480, total deflection is limited to L/240, where L is the span length.
   Box Beams - Live load deflection is limited to L/360, total deflection is limited to L/240, where L is the span length.
4. Grey areas in tables indicate instances where the joists do not backspan twice the cantilever distance or where the maximum joist span is exceeded.
5. Grey areas are established based on 12 in. O.C. joist capacity.
6. A partial list of section properties for each member is provided in the Trex Elevations Deck Framing / Inspection Details Table.
7. Joist and box beam capacity are determined with AISI-S100-07 (LRFD).
8. Joist yield stress is assumed as 33ksi.
9. Box beam yield stress is assumed as 50ksi.
10. If a box beam is supported by more than two posts, then its span selected above should be multiplied by 0.85 for a single box beam and 0.90 for a double box beam.
11. If a box beam is provided as an intermediate joist support, then its span selected above or modified by Note 10 should be multiplied by 0.60 for a "dropped" box beam and 0.70 for a "flush" box beam.

Table 6 – 200 PSF Span Chart – Residential

Table Instructions:	Enter the table with a joist span and cantilever length, then read the maximum allowable box beam span.

JOIST SPAN LIMITS (FEET / CENTIMETERS)					
12" JOIST SPACING O.C.			16" JOIST SPACING O.C.		
MAXIMUM JOIST SPAN (LEDGER TO BOX BEAM)	8' - 0"	243.8 cm	MAXIMUM JOIST SPAN (LEDGER TO BOX BEAM)	7' - 0"	213.4 cm
MAXIMUM CANTILEVER LENGTH	1' - 0"	30.5 cm	MAXIMUM CANTILEVER LENGTH	0' - 6"	15.2 cm
(Single Trex 1 5/8" Joist)			(Single Trex 1 5/8" Joist)		

MAXIMUM BOX BEAM SPAN (SINGLE BOX BEAM BETWEEN POSTS)

CANTILEVER LENGTH (FEET/CENTIMETERS)	JOIST SPAN (LEDGER TO BOX BEAM) (FEET / CENTIMETERS)															
	0' - 0" 0.0	1' - 0" 30.5	2' - 0" 61.0	3' - 0" 91.4	4' - 0" 121.9	5' - 0" 152.4	6' - 0" 182.9	7' - 0" 213.4	8' - 0" 243.8	9' - 0" 274.3	10' - 0" 304.8	11' - 0" 335.3	12' - 0" 365.8	13' - 0" 396.2	14' - 0" 426.7	15' - 0" 457.2
0' - 0" 0.0		19' - 11" 607.9	15' - 10" 482.5	13' - 10" 421.5	12' - 7" 382.9	11' - 4" 345.6	10' - 4" 315.5	9' - 7" 292.1	9' - 0" 273.2							
0' - 6" 15.2		15' - 10" 482.5	13' - 10" 421.5	12' - 7" 382.9	11' - 4" 345.6	10' - 4" 315.5	9' - 7" 292.1	9' - 0" 273.2	8' - 5" 257.6							
1' - 0" 30.5			12' - 7" 382.9	11' - 4" 345.6	10' - 4" 315.5	9' - 7" 292.1	9' - 0" 273.2	8' - 5" 257.6	8' - 0" 244.4							
1' - 6" 45.7																
2' - 0" 61.0																
2' - 6" 76.2																
3' - 0" 91.4																
3' - 6" 106.7																
4' - 0" 121.9																

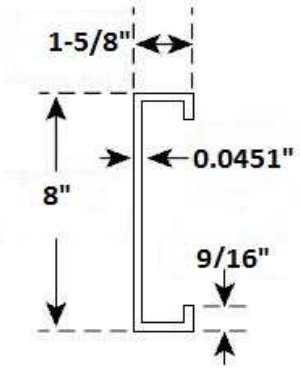
Table 6 – 200 PSF Span Chart – Residential (continued)

MAXIMUM BOX BEAM SPAN (DOUBLE BOX BEAM BETWEEN POSTS)

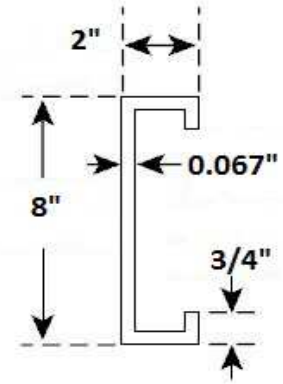
CANTILEVER LENGTH (FEET/CENTIMETERS)	JOIST SPAN (LEDGER TO BOX BEAM) (FEET / CENTIMETERS)															
	0' - 0" 0.0	1' - 0" 30.5	2' - 0" 61.0	3' - 0" 91.4	4' - 0" 121.9	5' - 0" 152.4	6' - 0" 182.9	7' - 0" 213.4	8' - 0" 243.8	9' - 0" 274.3	10' - 0" 304.8	11' - 0" 335.3	12' - 0" 365.8	13' - 0" 396.2	14' - 0" 426.7	15' - 0" 457.2
0' - 0" 0.0		25' - 2" 765.9	19' - 11" 607.9	17' - 5" 531.0	15' - 10" 482.5	14' - 8" 447.9	13' - 10" 421.5	13' - 2" 400.4	12' - 7" 382.9							
0' - 6" 15.2		19' - 11" 607.9	17' - 5" 531.0	15' - 10" 482.5	14' - 8" 447.9	13' - 10" 421.5	13' - 2" 400.4	12' - 7" 382.9	11' - 11" 362.2							
1' - 0" 30.5			15' - 10" 482.5	14' - 8" 447.9	13' - 10" 421.5	13' - 2" 400.4	12' - 7" 382.9	11' - 11" 362.2	11' - 3" 343.6							
1' - 6" 45.7																
2' - 0" 61.0																
2' - 6" 76.2																
3' - 0" 91.4																
3' - 6" 106.7																
4' - 0" 121.9																

NOTES:

1. All loads and load combinations are determined using ASCE 7-05. DL=Dead Load, LL=Live Load, SL=Snow Load.
   When LL<SL, the total load (TL) is 1.2DL+1.6SL+0.5LL, otherwise TL=1.2DL+1.6LL+0.5SL.
2. Loads used to produce the tables above are as follows: DL=10psf, LL=40psf, SL=150psf.
3. Deflection limits for joists are determined using IBC-2009 Section R505, Steel Floor Framing.
   Joists - Live load deflection is limited to L/480, total deflection is limited to L/240, where L is the span length.
   Box Beams - Live load deflection is limited to L/360, total deflection is limited to L/240, where L is the span length.
4. Grey areas in tables indicate instances where the joists do not backspan twice the cantilever distance or where the maximum joist span is exceeded.
5. Grey areas are established based on 12 in. O.C. joist capacity.
6. A partial list of section properties for each member is provided in the Trex Elevations Deck Framing / Inspection Details Table.
7. Joist and box beam capacity are determined with AISI-S100-07 (LRFD).
8. Joist yield stress is assumed as 33ksi.
9. Box beam yield stress is assumed as 50ksi.
10. If a box beam is supported by more than two posts, then its span selected above should be multiplied by 0.85 for a single box beam and 0.90 for a double box beam.
11. If a box beam is provided as an intermediate joist support, then its span selected above or modified by Note 10 should be multiplied by 0.60 for a "dropped" box beam and 0.70 for a "flush" box beam.

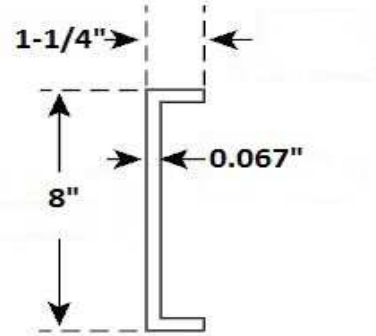


1-5/8” Joist



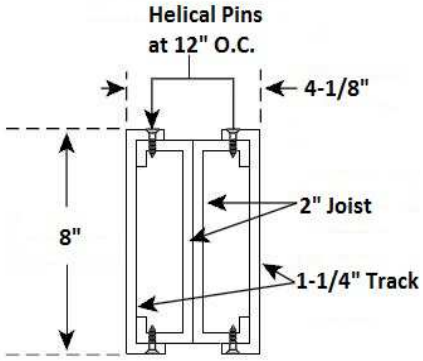
2” Joist

Figure 3 – Steel Joists

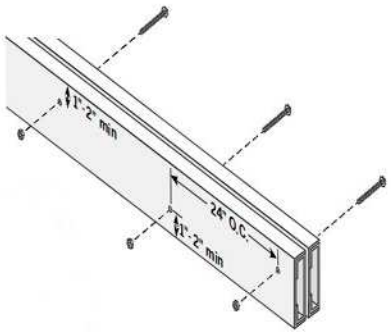


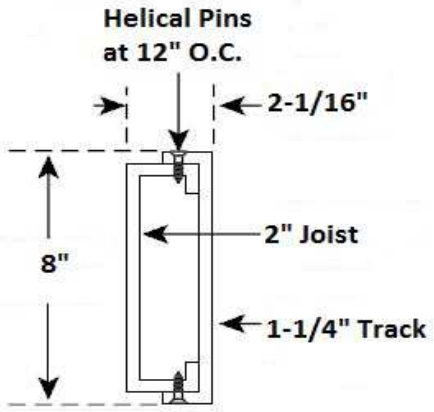
1-1/4” Track

Figure 4 – Track/Ledger



Double Box Beam





Single Box Beam

Figure 5 – Box Beams

Table 7 – Component Fastening Schedule – Metal to Metal

Connection	Fasteners
1-5/8 joist to dropped box beam	(1) #10 screw from joist bottom flange to dropped beam top flange
1-5/8 joist to flush box beam	Simpson 16 gauge L70 angle bracket w/ (8) - #10 screws
1-5/8 joist to continuous track/ledger	(1) - #10 screw into top and bottom flange of 1-5/8 joist + Simpson 16 gauge L70 angle bracket w/ (8) - #10 screws
1-5/8 joist to continuous track (front plate)	(1) - #10 screw into top and bottom flange of 1-5/8 joist
Joist blocking to dropped box beam	Non-Hurricane Zone: (1) - #10 screw from blocking bottom flange to dropped beam top flange
	Hurricane Zone: (4) - #10 screws from blocking bottom flange to dropped beam top flange
Joist blocking to 1-5/8 joist	Simpson 16 gauge L70 angle bracket w/ (8) - #10 screws
1-5/8 joist to continuous track (outer rim)	#10 screw into top and bottom flange of 1-5/8 joist at 12” on center

1. **Fasteners shall be #10 x 3/4", 16 threads per inch, #2 drill point, corrosion-resistant, self-drilling, self-tapping hex head screws.**
2. **Quantity of fasteners indicated for Non-Hurricane Zone is based on the following parameters: Kz = 0.90; Kzt = 1.0; Kd = 0.85; V = 90 mph; I = 1.00**
3. **Quantity of fasteners indicated for Hurricane Zone is based on the following parameters: Kz = 0.90; Kzt = 1.0; Kd = 0.85; V = 150 mph; I = 1.00**

Table 8 – Single Box Beam to Notched Wood Support Post Fastening Schedule

Location	Fasteners
Non-Hurricane Zone	(2) 1/2" diameter, 8” long A307 carriage bolts
Hurricane Zone	(4) 1/2" diameter, 8” long A307 carriage bolts and (2) Simpson MSTA18 post to beam connectors. Each Simpson MSTA18 connector shall be fastened to box beam with (5) - #10 screws and fastened to wood support post with (20) – 10d nails

1. **Wood support post shall have a specific gravity of 0.50 or greater.**
2. **Unless noted otherwise, fasteners shall be self-drilling, self-tapping hex head screws.**

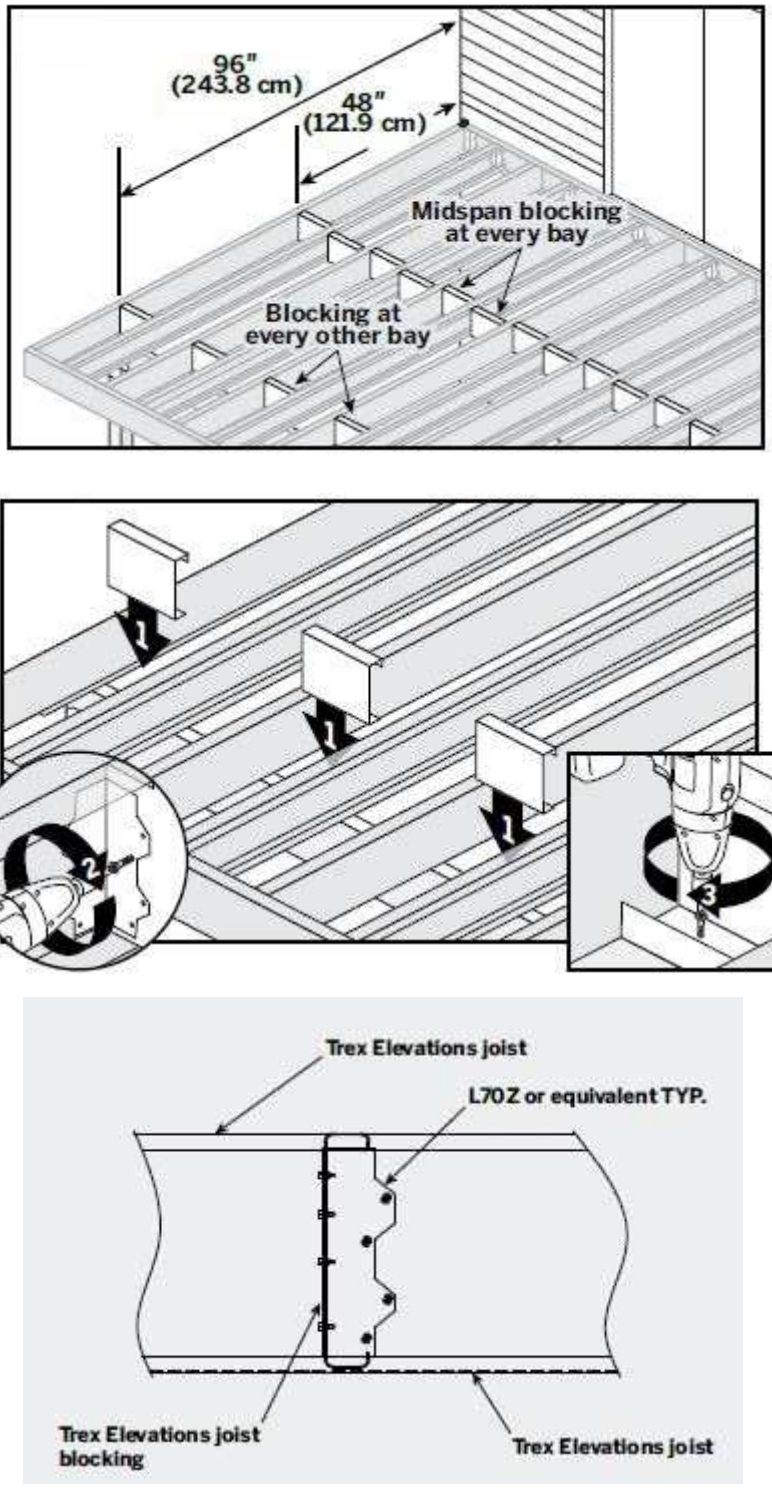


Figure 6 – 1-5/8 Joist Blocking Details

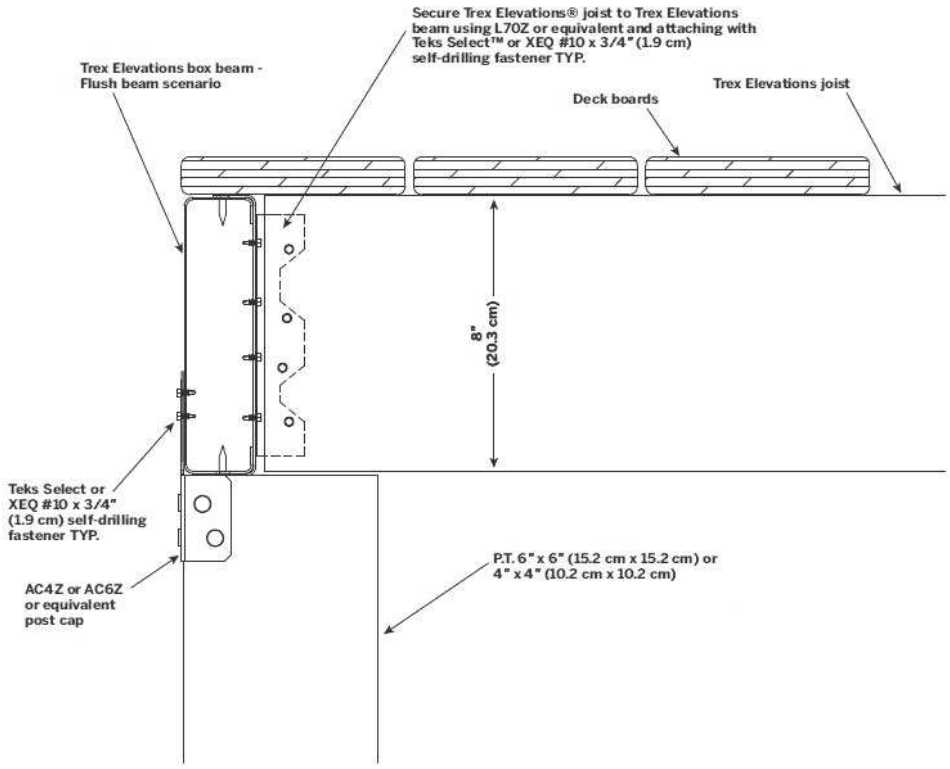


Figure 7 – 1-5/8 Joist to Box Beam Construction Detail – Flush Beam Scenario

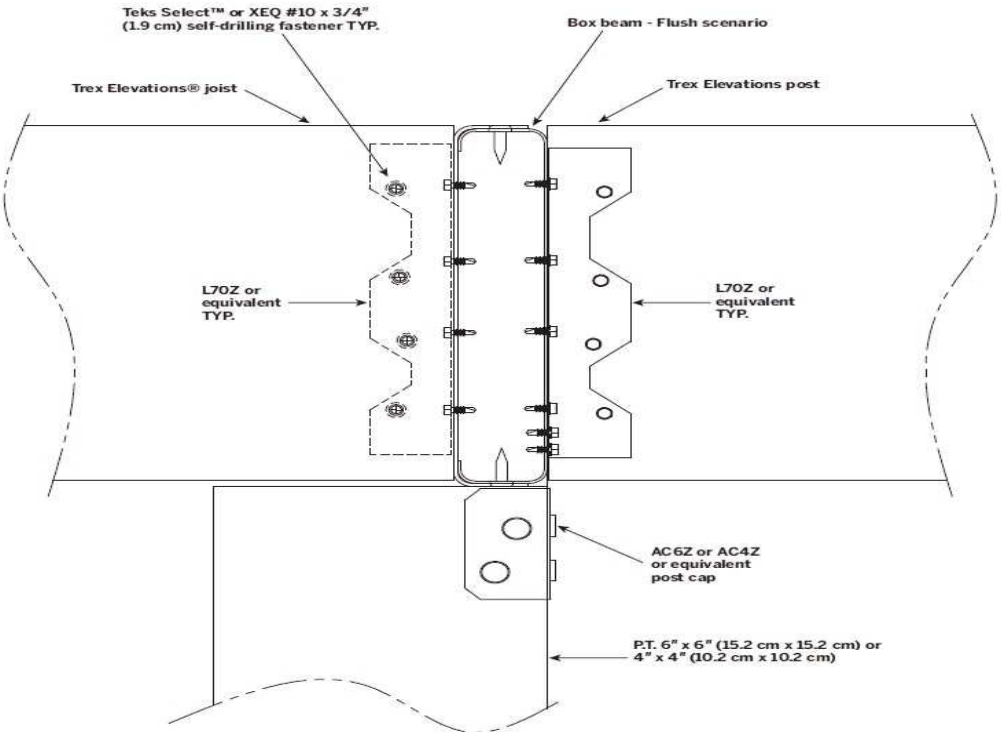


Figure 8 – 1-5/8 Joist to Box Beam Construction Detail – Sharing Flush Beam Scenario

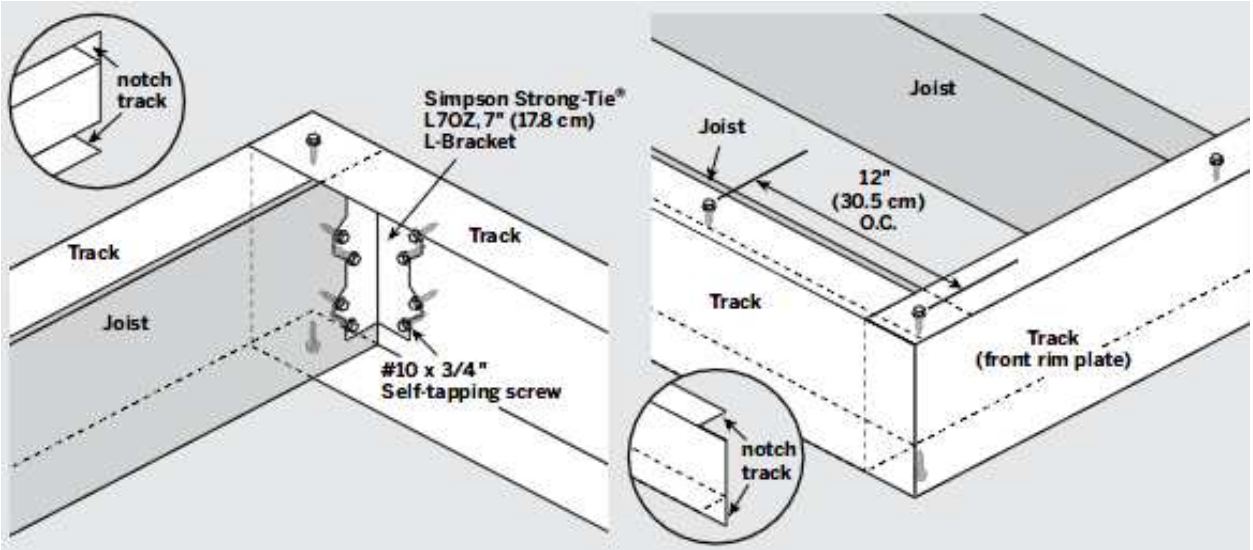
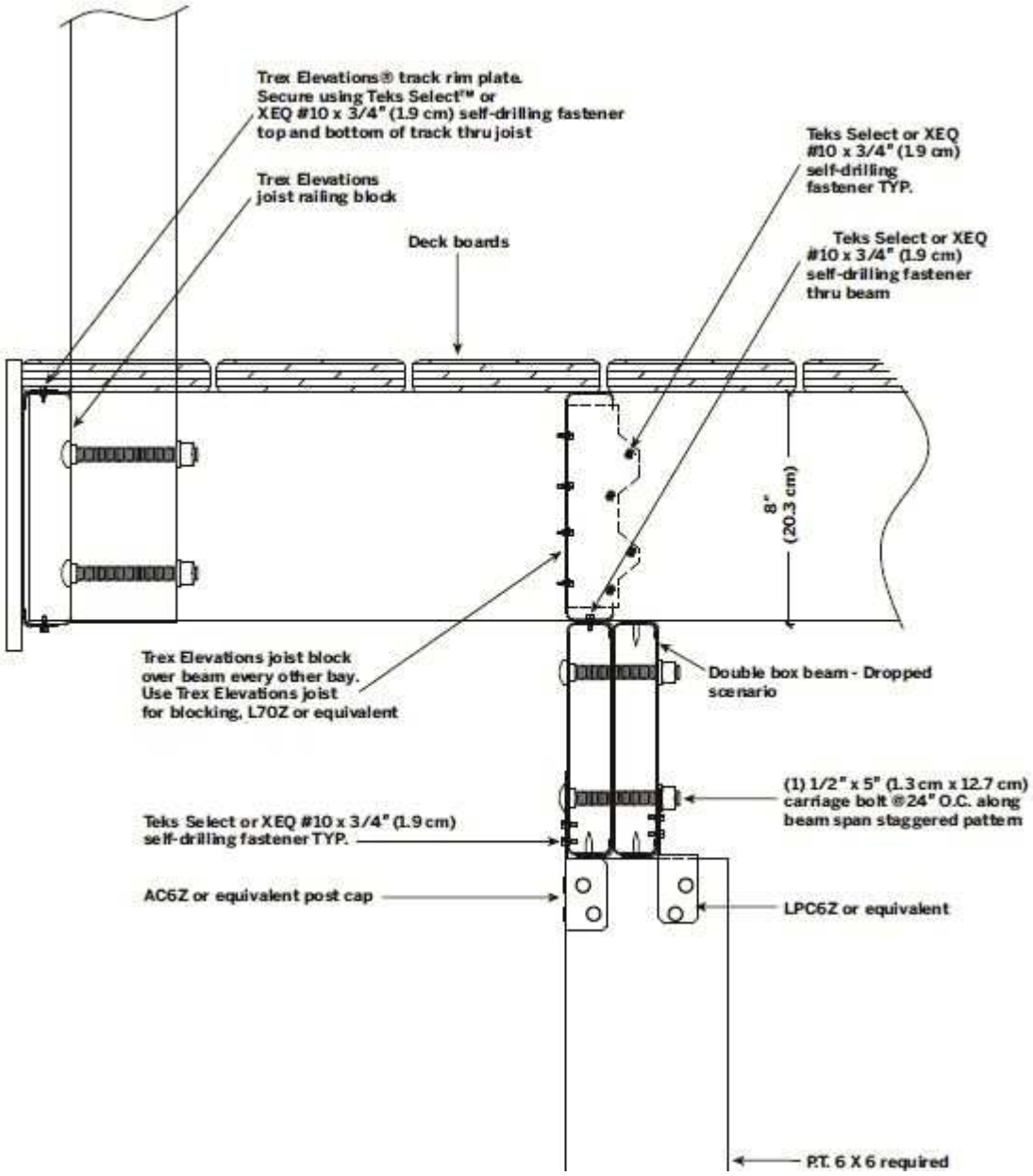
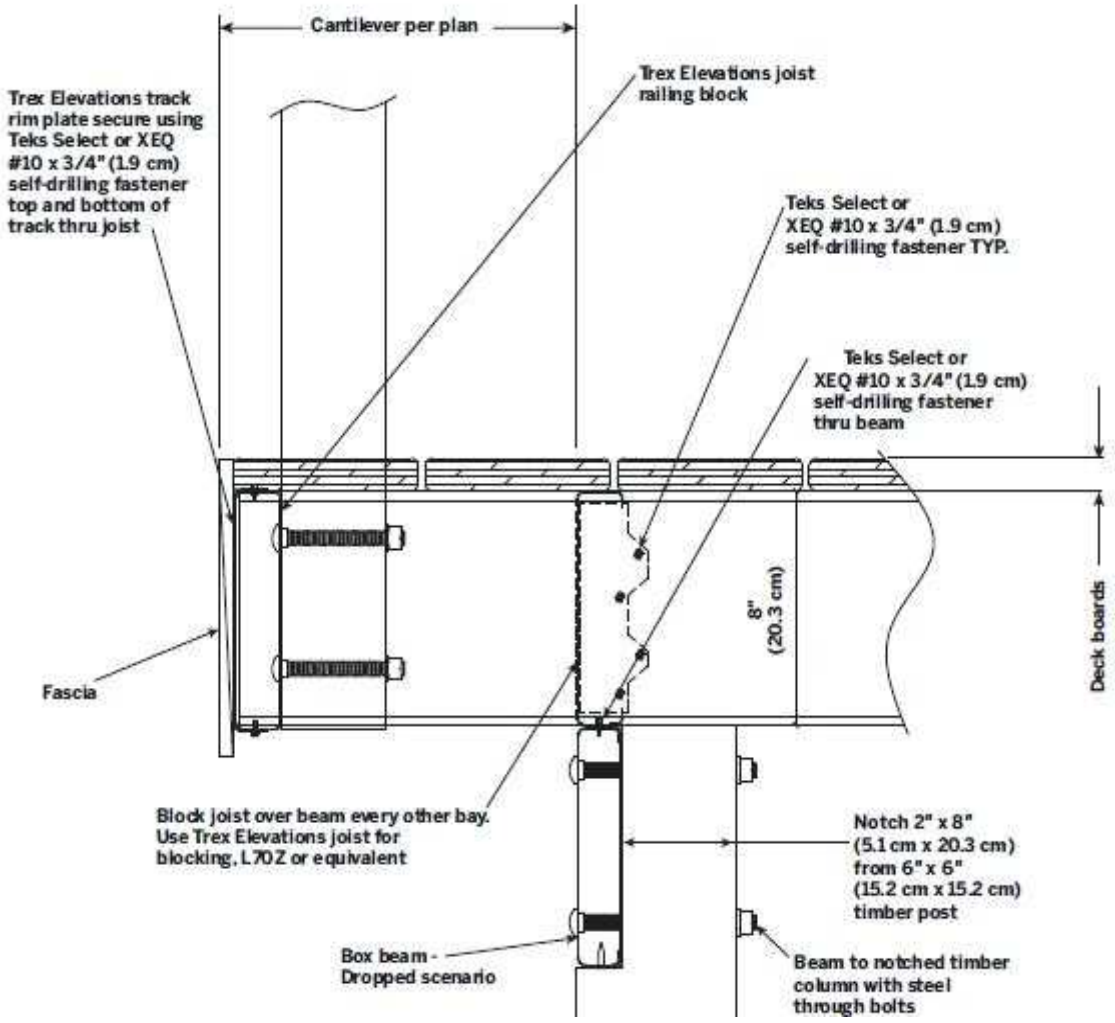


Figure 9 – 1-5/8 Joist to Track/Ledger and Joist to Track (front plate) Connection Details



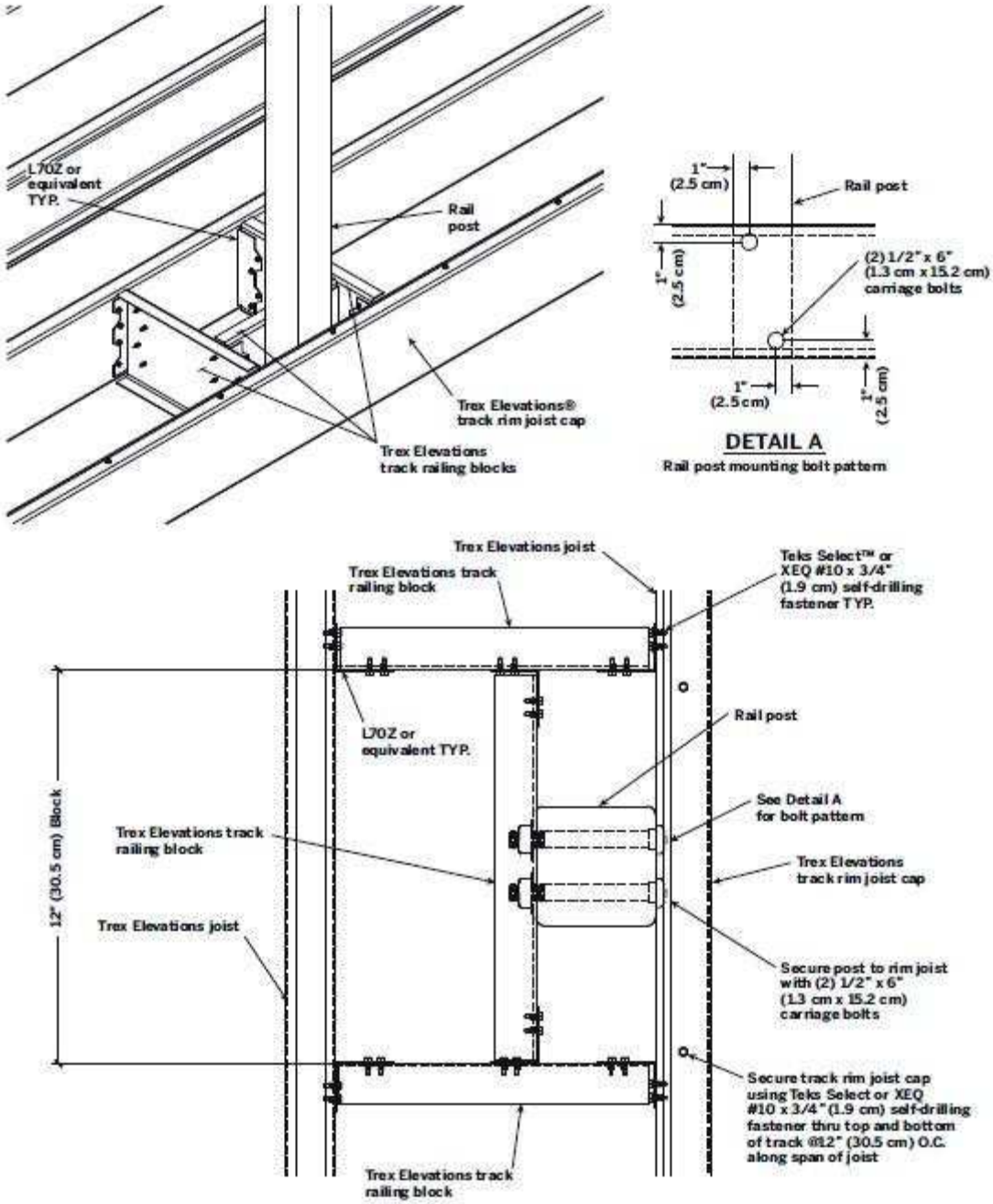
Double Box Beam

Figure 10 – Box Beam to Post Detail – Dropped Beam Construction



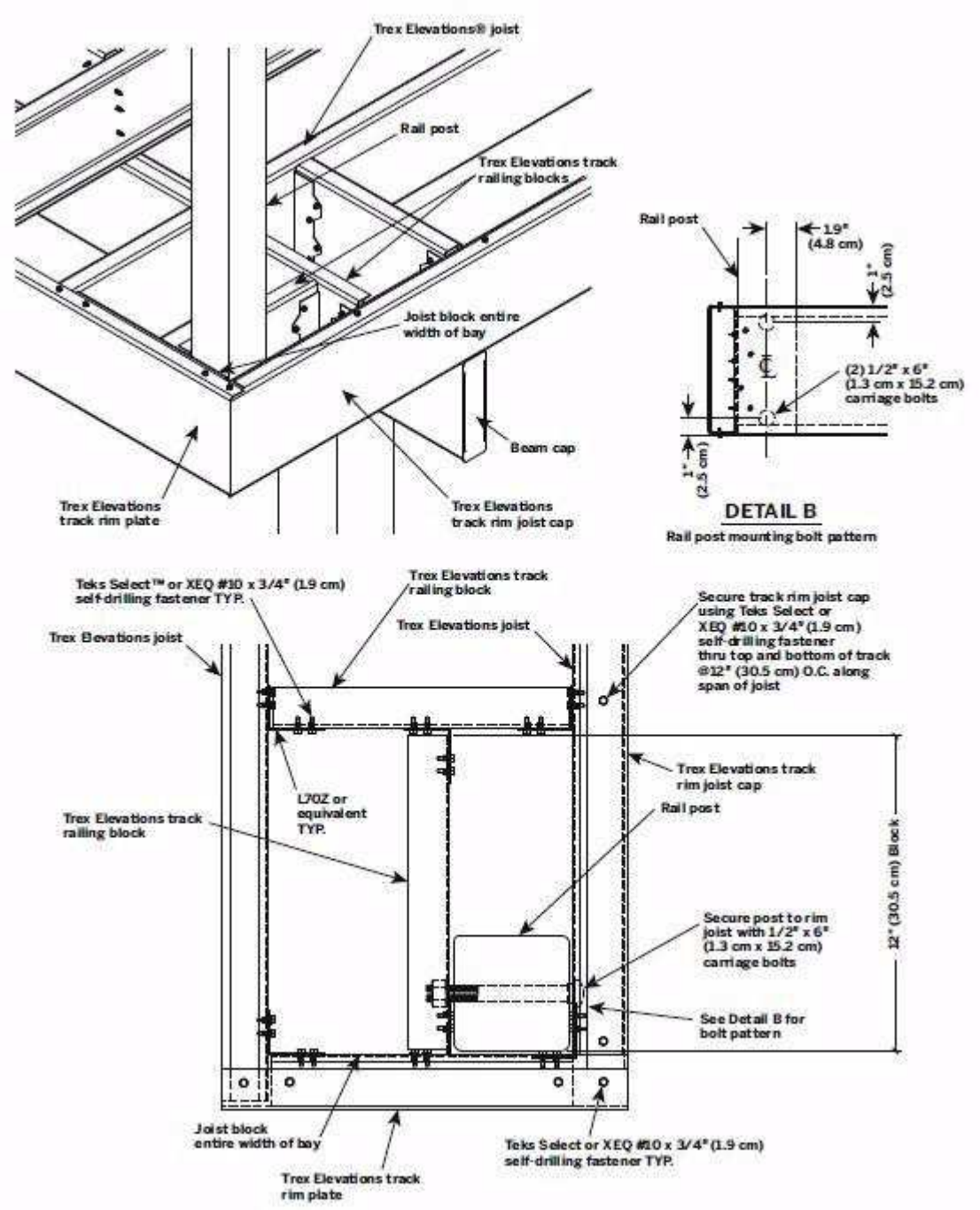
Single Box Beam – 6x6 post

Figure 10 – Box Beam to Post Detail – Dropped Beam Construction (continued)



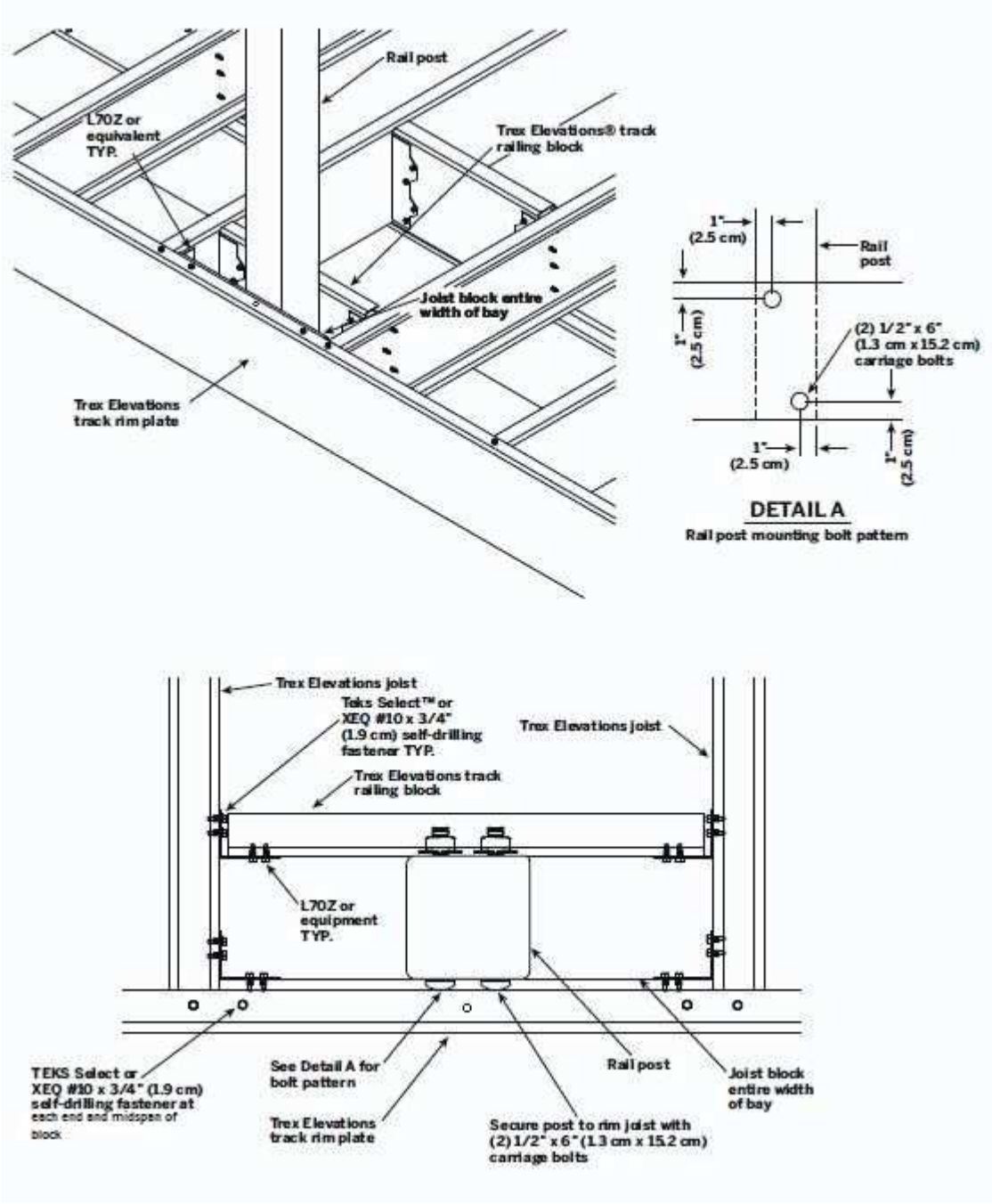
Outer Joist Condition

Figure 11 – Rail Post Installation Details



Corner Condition

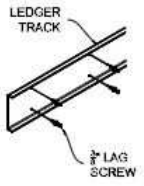
Figure 11 – Rail Post Installation Details (continued)



Front Plate Condition

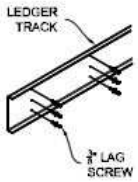
Figure 11 – Rail Post Installation Details (continued)

Table 9 – Continuous track/ledger fastening schedule



On Center Spacing -3/8" x 2.5" Hot-dipped Galvanized Lag Screws

2 Screws	Joist Span														
Combined Load	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'
50 psf	24"							16"				12"			
75 psf	24"						16"			12"			10"		
100 psf	24"					16"		12"			9"				
Over 100 psf	Consult with your engineer or local building code official.														



On Center Spacing -3/8" x 2.5" Hot-dipped Galvanized Lag Screws

3 Screws	Joist Span														
Combined Load	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'
50 psf	24"											16"			
75 psf	24"										16"				
100 psf	24"							16"				14"			
Over 100 psf	Consult with your engineer or local building code official.														

Requirements:

- ⅜" lag screws are used to connect the steel ledger to the wood Rim Plate of the structure
- Screws are long enough to penetrate through the entire thickness of the wood Rim Plate
- The maximum length of unthreaded shank of the lag screws is ¾ inch
- The minimum length of unthreaded shank of the lag screws is 3/16 inch
- Wood Rim Plate is assumed to be 1.5 in. thick and from southern pine (specific gravity of 0.55)
- 5 in. end spacing is required from two ends of the wood Rim Plate
- 2 or 3 rows of fasteners are considered
- 1.5 in. minimum edge distance from the top and bottom fasteners to the edge of the wood Rim Plate is required
- When 2 rows of lag screws are used, minimum vertical distance of 4 in. between the rows of fasteners is required
- When 3 rows of lag screws are used, minimum vertical distance of 2 in. between the rows of fasteners is required

Table10 – Trex Elevations Fasteners

Metal to Metal	**Decking to Metal[1] – Face Attachment**
Simpson Strong-Tie XEQ34B1016	FastenMaster® Cortex Driller™ **
ITW Buildex Teks Select™ P/N 1076000 (10-16 x ¾" HWH Teks 3)	DeckFast® Metal 410 SS w/ Epoxy Coating
	Simpson Strong-Tie Quik Drive DCSD238(xxxx) * xxxx denotes color code of product

1. Decking to Metal Fasteners must be evaluated for wind uplift capacity.