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Revised Date: 04-05-2024  
Renewal Date: 04-30-2025

**DIVISION: 05 00 00 METALS**

Section: 05 40 00 Cold-Formed Metal Framing

**REPORT HOLDER:**

New Castle Steel, Inc.  
1000 Pine Mill Drive  
Marietta, GA 30066  
678-982-4173  
[newcastlega.com](http://newcastlega.com)

**REPORT SUBJECT:**

*New Castle Steel Deck System*

### 1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2021, 2018, 2015, 2012 *International Building Code*® (IBC)
- 2021, 2018, 2015, 2012 *International Residential Code*® (IRC)

NOTE: This report references the most recent code editions cited. Section numbers in earlier editions may differ.

1.2 *New Castle Steel Deck System* has been evaluated for the following properties:

- Structural Performance

1.3 *New Castle Steel Deck System* has been evaluated for the following uses:

- As described in this report, *New Castle Steel Deck System* is a cold-formed steel framing system used as the substructure of an exterior deck.

### 2.0 STATEMENT OF COMPLIANCE

*New Castle Steel Deck System* complies with the Codes listed in Section 1.1, for the properties stated in Section 1.2, and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in Section 6.0.

### 3.0 DESCRIPTION

3.1 *New Castle Steel Deck System* is an assemblage of cold-formed steel components installed with metal hangers and fasteners.

3.1.1 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.

3.1.2 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.

3.1.3 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 0.100 inch 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.

3.1.4 Double box beams are field- assembled with two 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.

### 4.0 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** *New Castle Steel Deck System* is designed to resist a concentrated load as described in IRC Table R301.5 for up to 36-inch-high rail posts. See Figure 11 for installation configurations.

## 5.0 INSTALLATION

**5.1 General:** *New Castle Steel Deck System* must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. A copy of the manufacturer's instructions must be available on the jobsite during installation.

**5.2** Joists may bear on the top flange of the box beam (dropped beam construction) or joists may be fastened to the 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.

**5.3** Joist blocking is required every other bay above dropped beams for all joist spans and every bay at joist mid-span 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 joist blocking details.

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

**5.5** See Table 7 for metal-to-metal component fastening schedule.

**5.6** See Table 10 for approved *New Castle Steel Deck System* fasteners.

**5.7** 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.

**5.8** 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.

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

**5.10** 1-5/8-inch joists are attached to continuous track/ledger as illustrated in Figure 9.

**5.11** 1-5/8-inch joists are attached to continuous track (front plate) as illustrated in Figure 9.

**5.12** 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.

**5.13** Deck framing anchorage for lateral load shall comply with IRC Sections R301 and R507.9.1.3, and IBC Section 1604.8.3. See Paragraph 7.3

**5.14** Deck boards shall be positively fastened to each joist.

## 6.0 CONDITIONS OF USE

**6.1** Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict, this report governs.

**6.2** *New Castle Steel Deck System*, identified in this report, is deemed to comply with the intent of the provisions of the referenced building codes subject to the following conditions:

**6.3** 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.

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

**6.5** Additional design and construction are required for anchorage of lateral loads to the primary framing in accordance with IRC Sections R301 and R507.9.1.3, and IBC Section 1604.8.3.





**6.6** *New Castle Steel Deck System* 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.

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

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

**6.9** 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.

**6.10** 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.

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

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

**6.13** 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.

**6.14** *New Castle Steel Deck System* is manufactured in accordance with the manufacturer's approved quality control system with inspections by Intertek Testing Services NA, Inc.

## 7.0 SUPPORTING EVIDENCE

**7.1** Manufacturer's drawings and installation instructions.

**7.2** Reports of engineering analysis in accordance with ICC-ES AC46, Acceptance Criteria for Cold-Formed Steel Framing Members, approved October 2019, editorially revised December 2020.

**7.3** Reports of testing and engineering analysis in accordance with AISI S100-16(2020), North American Specification for the Design of Cold-Formed Steel Structural Members.

**7.4** Documentation of an Intertek approved quality control system for the manufacturing of products recognized in this report.

## 8.0 IDENTIFICATION

**8.1** *New Castle Steel Deck System* 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:

- Manufacturer's identification (New Castle Steel)
- The product name (New Castel Steel Deck System)
- The material minimum base steel thickness in mils or decimal inches
- Minimum coating designation (G60)
- Minimum yield strength (ksi)
- Bundle labels shall include the Intertek Mark as shown below, the Code Compliance Research Report number (CCRR-0449), and the statement, "See CCRR-0449 at <https://bpdirectory.intertek.com> for uses and performance levels."



## 9.0 OTHER CODES

This section is not applicable.

## 10.0 CODE COMPLIANCE RESEARCH REPORT USE

**10.1** 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.



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**10.2** Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

**10.3** Reference to the <https://bpdirectory.intertek.com> is recommended to ascertain the current version and status of this report.

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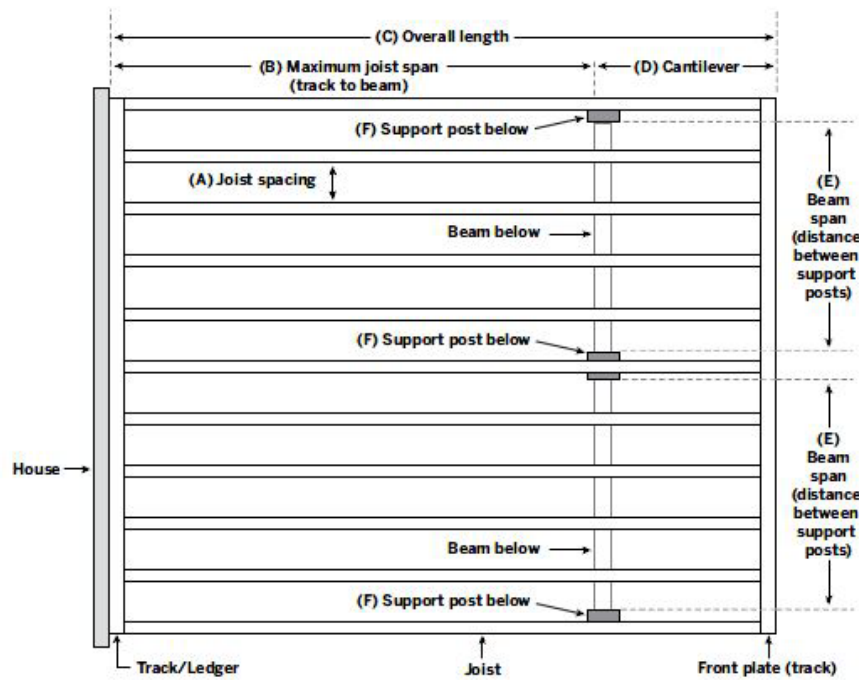


FIGURE 1 – SINGLE BEAM PLAN

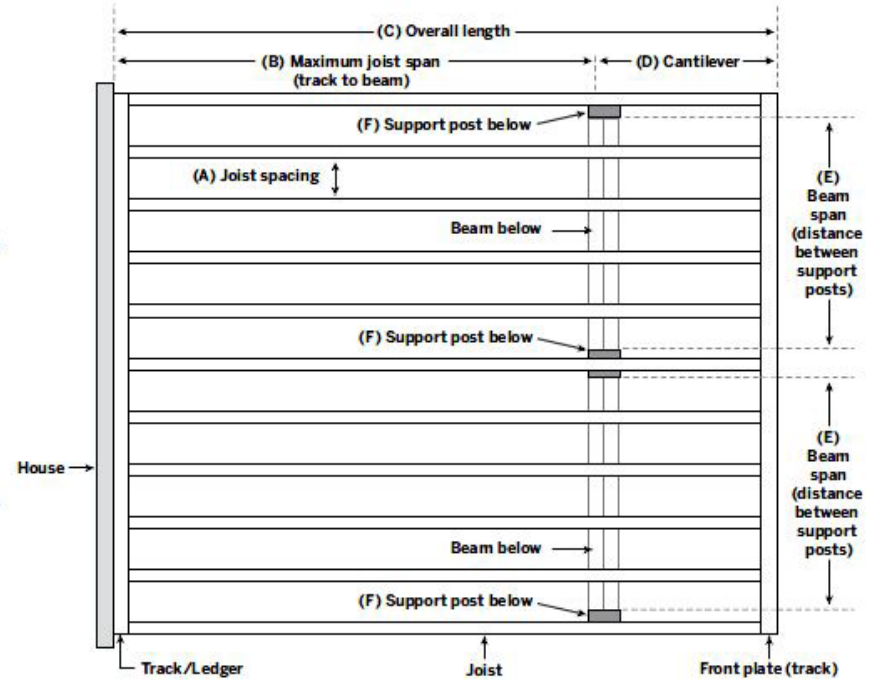


FIGURE 2 – DOUBLE BEAM PLAN

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**TABLE 1 – 50 PSF SPAN CHART – RESIDENTIAL**

<b>Table Instructions:</b>	Enter the table with a joist span and cantilever length, then read the maximum allowable box beam span.
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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 1-5/8" Joist)

(Single 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			
<b>CANTILEVER LENGTH (FEET/CENTIMETER)</b>	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	11' - 10" 368.2	11' - 4" 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" 368.2	11' - 4" 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" 368.2	11' - 4" 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" 368.2	11' - 4" 368.2	11' - 10" 360.4	11' - 7" 353.1	11' - 4" 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" 368.2	11' - 7" 360.4	11' - 4" 353.1	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" 368.2	11' - 7" 360.4	11' - 4" 353.1	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" 368.2	11' - 7" 360.4	11' - 4" 353.1	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" 368.2	11' - 7" 360.4	11' - 4" 353.1	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' - 10" 360.4	11' - 7" 353.1	11' - 4" 344.6	10' - 9" 326.9	10' - 6" 319.0	10' - 3" 311.7	10' - 0" 304.8	10' - 0" 304.8

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TABLE 1 – 50 PSF SPAN CHART – RESIDENTIAL (CONTINUED)

MAXIMUM BOX BEAM SPAN (DOUBLE 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/CENTIMETER)	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			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

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**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 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 New Castle Steel Deck Framing / Inspection Details Table.
7. Joist and box beam capacity are determined with AISI-S100(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).



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**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 1-5/8" Joist)

(Single 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				
<b>CANTILEVER LENGTH (FEET/CENTIMETER)</b>	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	11' - 3" 341.8				
	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	11' - 0" 334.5	10' - 9" 327.8			
	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	10' - 9" 327.8	10' - 6" 319.3	10' - 3" 310.8		
	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	10' - 6" 319.3	10' - 3" 310.8	10' - 0" 295.6	9' - 9" 288.8	
	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	10' - 3" 310.8	10' - 0" 295.6	9' - 9" 288.8	9' - 6" 281.9	
	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' - 3" 310.8	10' - 0" 295.6	9' - 9" 288.8	9' - 6" 281.9	9' - 3" 275.0	
	3' - 0" 91.4							12' - 10" 391.3	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' - 3" 310.8	10' - 0" 295.6	9' - 9" 288.8	9' - 6" 281.9	9' - 3" 275.0	9' - 0" 268.1	
	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' - 3" 310.8	10' - 0" 295.6	9' - 9" 288.8	9' - 6" 281.9	9' - 3" 275.0	9' - 0" 268.1	8' - 9" 261.2	
	4' - 0" 121.9									11' - 0" 334.5	10' - 9" 327.8	10' - 6" 319.3	10' - 3" 310.8	10' - 0" 295.6	9' - 9" 288.8	9' - 6" 281.9	9' - 3" 275.0	9' - 0" 268.1	8' - 9" 261.2	8' - 6" 254.3	

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TABLE 2 – 75 PSF SPAN CHART – RESIDENTIAL (CONTINUED)

MAXIMUM BOX BEAM SPAN (DOUBLE 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/CENTIMETER)	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' - 5" 379.0	

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**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 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 New Castle Steel Deck Framing / Inspection Details Table.
7. Joist and box beam capacity are determined with AISI-S100(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).



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TABLE 3 – 100 PSF SPAN CHART - RESIDENTIAL

<b>Table Instructions:</b>	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"	385.8 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 1-5/8" Joist)

(Single 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/CENTIMETER)	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			

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TABLE 3 – 100 PSF SPAN CHART – RESIDENTIAL (CONTINUED)

**MAXIMUM BOX BEAM SPAN (DOUBLE 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
<b>CANTILEVER LENGTH (FEET/CENTIMETER)</b>	0' - 0" 0.0		31' - 8" 964.9	25' - 2" 765.9	21' - 11" 669.1	19' - 11" 607.9	18' - 8" 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' - 8" 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' - 8" 410.4			
	1' - 0" 30.5			19' - 11" 607.9	18' - 8" 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' - 8" 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' - 8" 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' - 8" 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' - 8" 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' - 8" 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			

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**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 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 New Castle Steel Deck Framing / Inspection Details Table.
7. Joist and box beam capacity are determined with AISI-S100(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).



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TABLE 4 – 125 PSF SPAN CHART – RESIDENTIAL

<b>Table Instructions:</b>	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 1-5/8" Joist)

(Single 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/CENTIMETER)	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" 256.4						
	3' - 6" 106.7																	
	4' - 0" 121.9																	

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TABLE 4 – 125 PSF SPAN CHART – RESIDENTIAL (CONTINUED)

**MAXIMUM BOX BEAM SPAN (DOUBLE 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	
<b>CANTILEVER LENGTH (FEET / CENTIMETER)</b>	0' - 0" 0.0		29' - 5" 895.8	23' - 4" 711.0	20' - 5" 621.1	18' - 8" 564.3	17' - 2" 523.8	16' - 2" 493.0	15' - 4" 468.3	14' - 8" 447.9	14' - 2" 430.8	13' - 8" 415.8						
	0' - 6" 15.2		23' - 4" 711.0	20' - 5" 621.1	18' - 8" 564.3	17' - 2" 523.8	16' - 2" 493.0	15' - 4" 468.3	14' - 8" 447.9	14' - 2" 430.8	13' - 8" 415.8	13' - 3" 402.8						
	1' - 0" 30.5			18' - 8" 564.3	17' - 2" 523.8	16' - 2" 493.0	15' - 4" 468.3	14' - 8" 447.9	14' - 2" 430.8	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" 430.8	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" 430.8	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																	

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**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 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 New Castle Steel Deck Framing / Inspection Details Table.
7. Joist and box beam capacity are determined with AISI-S100(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).



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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 1-5/8" Joist)

(Single 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/CENTIMETERS)	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																

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TABLE 5 – 150 PSF SPAN CHART – RESIDENTIAL (CONTINUED)

MAXIMUM BOX BEAM SPAN (DOUBLE 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/CENTIMETER)	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																	

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**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 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 New Castle Steel Deck Framing / Inspection Details Table.
7. Joist and box beam capacity are determined with AISI-S100(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 0.15 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).



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TABLE 6 – 200 PSF SPAN CHART – RESIDENTIAL

<b>Table Instructions:</b>	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 1-5/8" Joist)

(Single 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/CENTIMETER)	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																	

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TABLE 6 – 200 PSF SPAN CHART – RESIDENTIAL (CONTINUED)

**MAXIMUM BOX BEAM SPAN (DOUBLE 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
<b>CANTILEVER LENGTH (FEET/CENTIMETER)</b>	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																

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**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 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 New Castle Steel Deck Framing / Inspection Details Table.
7. Joist and box beam capacity are determined with AISI-S100(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).



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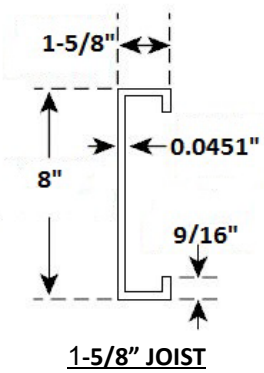


FIGURE 3 – STEEL JOISTS

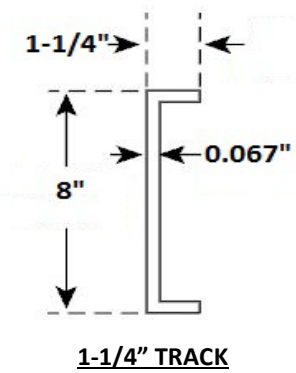
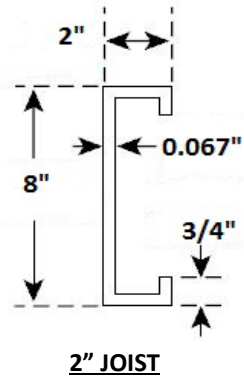
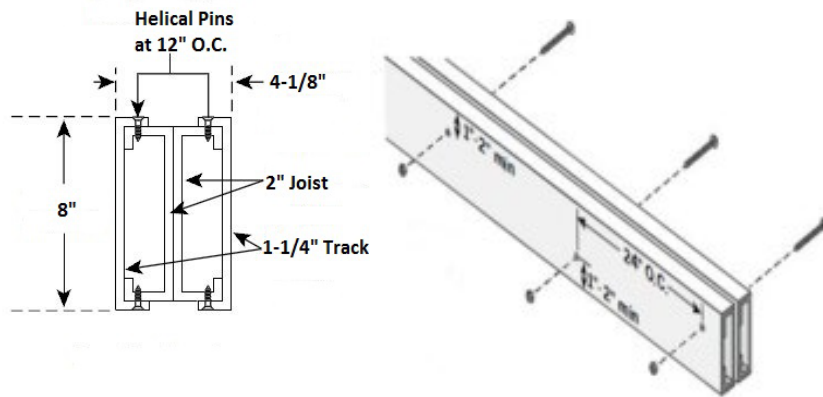
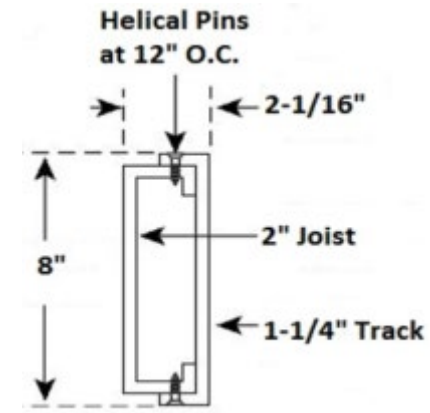


FIGURE 4 – TRACK/LEDGER



DOUBLE BOX BEAM



SINGLE BOX BEAM

FIGURE 5 – BOX BEAMS

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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

- Fasteners shall be #10 x 3/4", 16 threads per inch, #2 drill point, corrosion-resistant, self-drilling, self-tapping hex head screws.
- 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
- 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 MST18 post to beam connectors. Each Simpson MST18 connector shall be fastened to box beam with (5) - #10 screws and fastened to wood support post with (20) – 10d nails

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



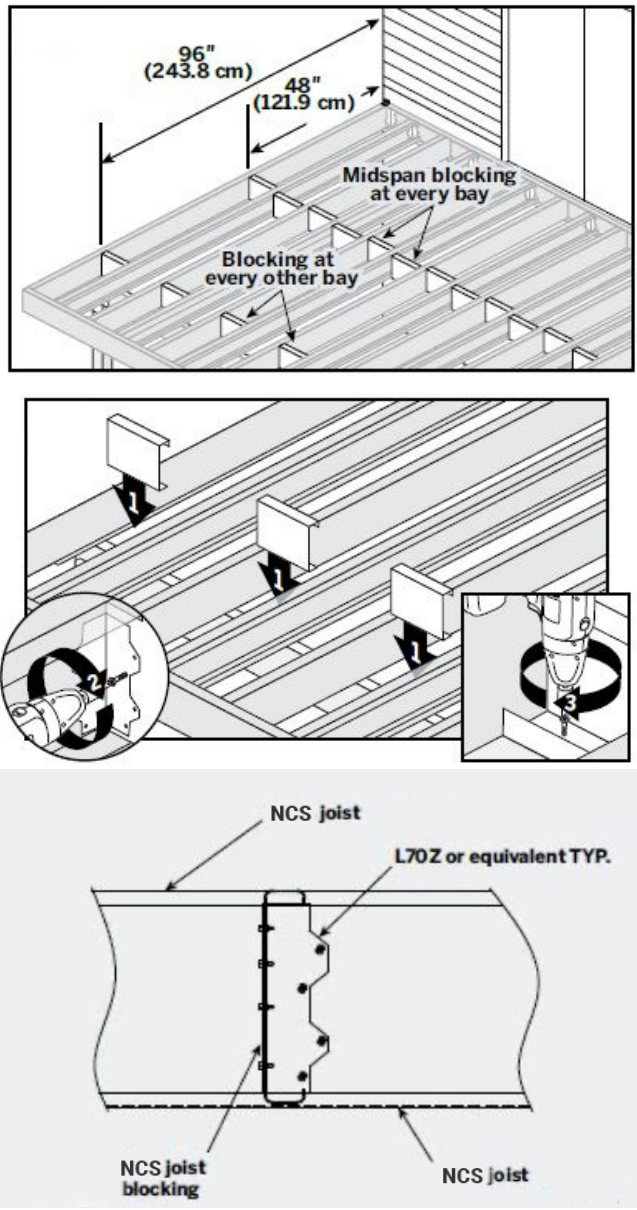


FIGURE 6 – 1-5/8 JOIST BLOCKING DETAILS

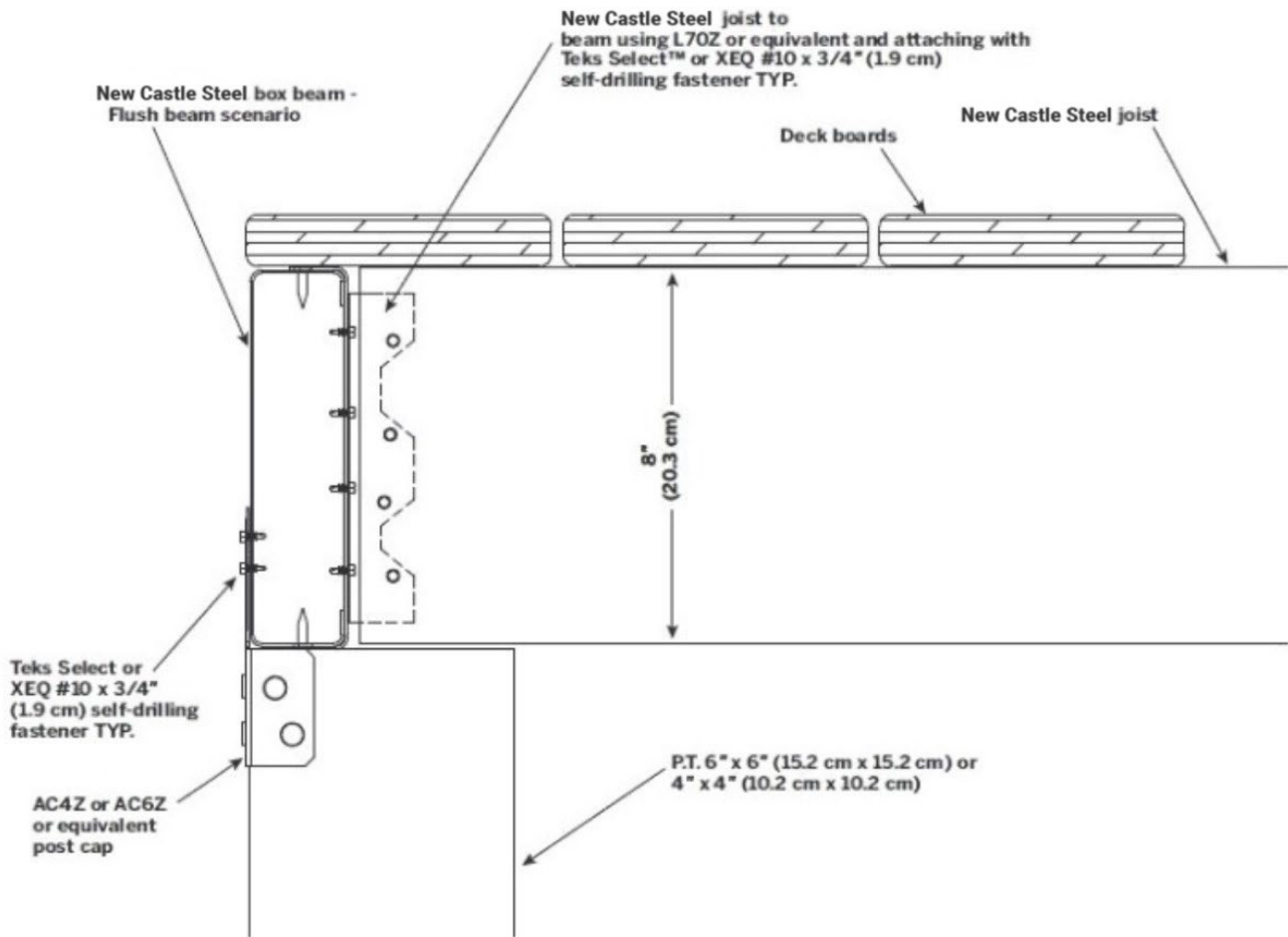


FIGURE 7 – 1-5/8 JOIST TO BOX BEAM CONSTRUCTION DETAIL – FLUSH BEAM SCENARIO

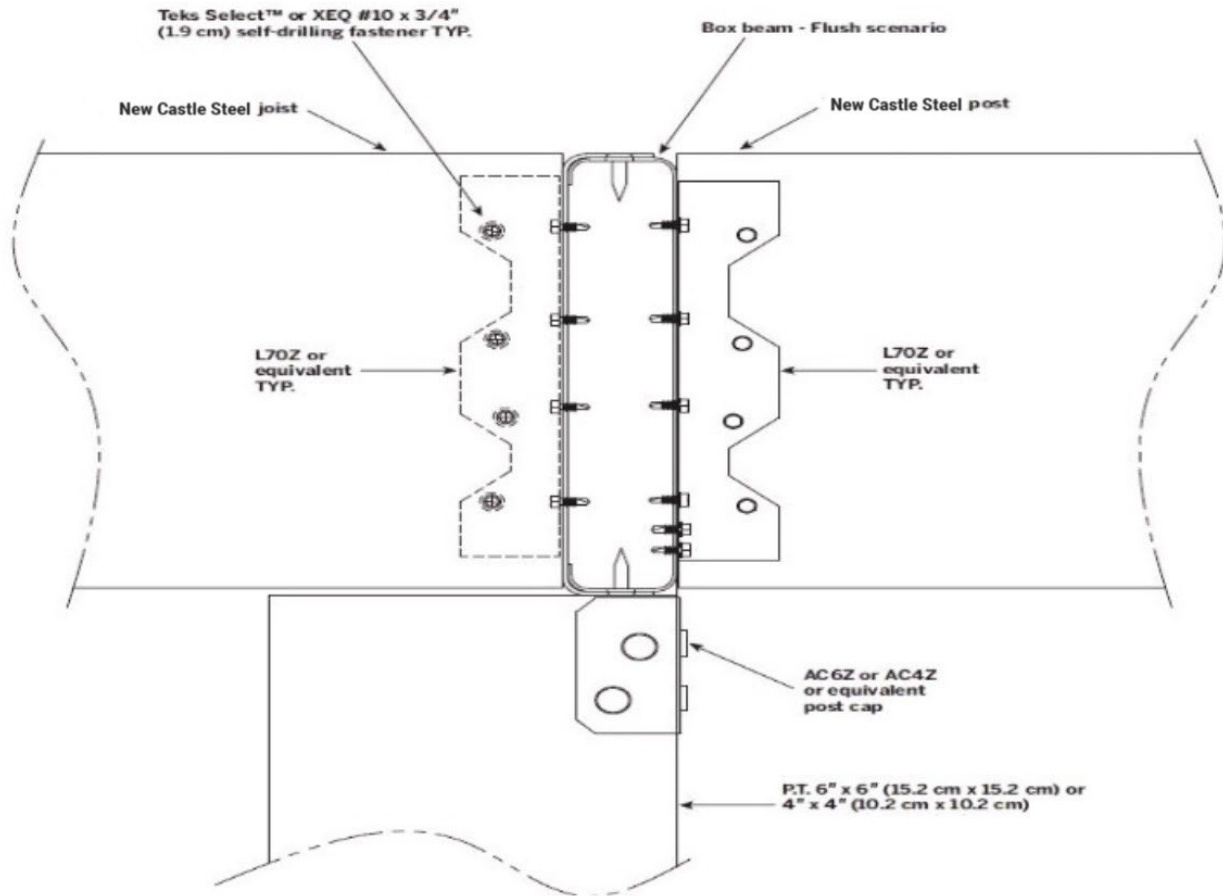


FIGURE 8 – 1-5/8 JOIST TO BOX BEAM CONSTRUCTION DETAIL – SHARING FLUSH BEAM SCENARIO

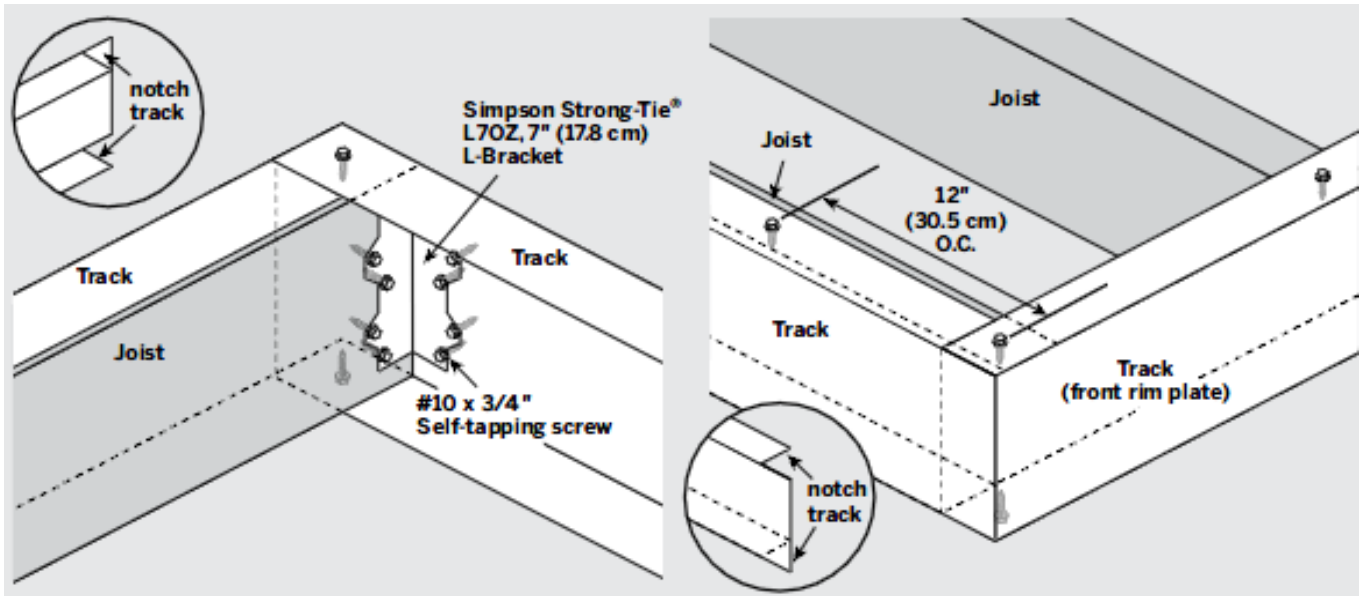


FIGURE 9 – 1-5/8 JOIST TO TRACK/LEDGER AND JOIST TO TRACK (FRONT PLATE) CONNECTION DETAILS

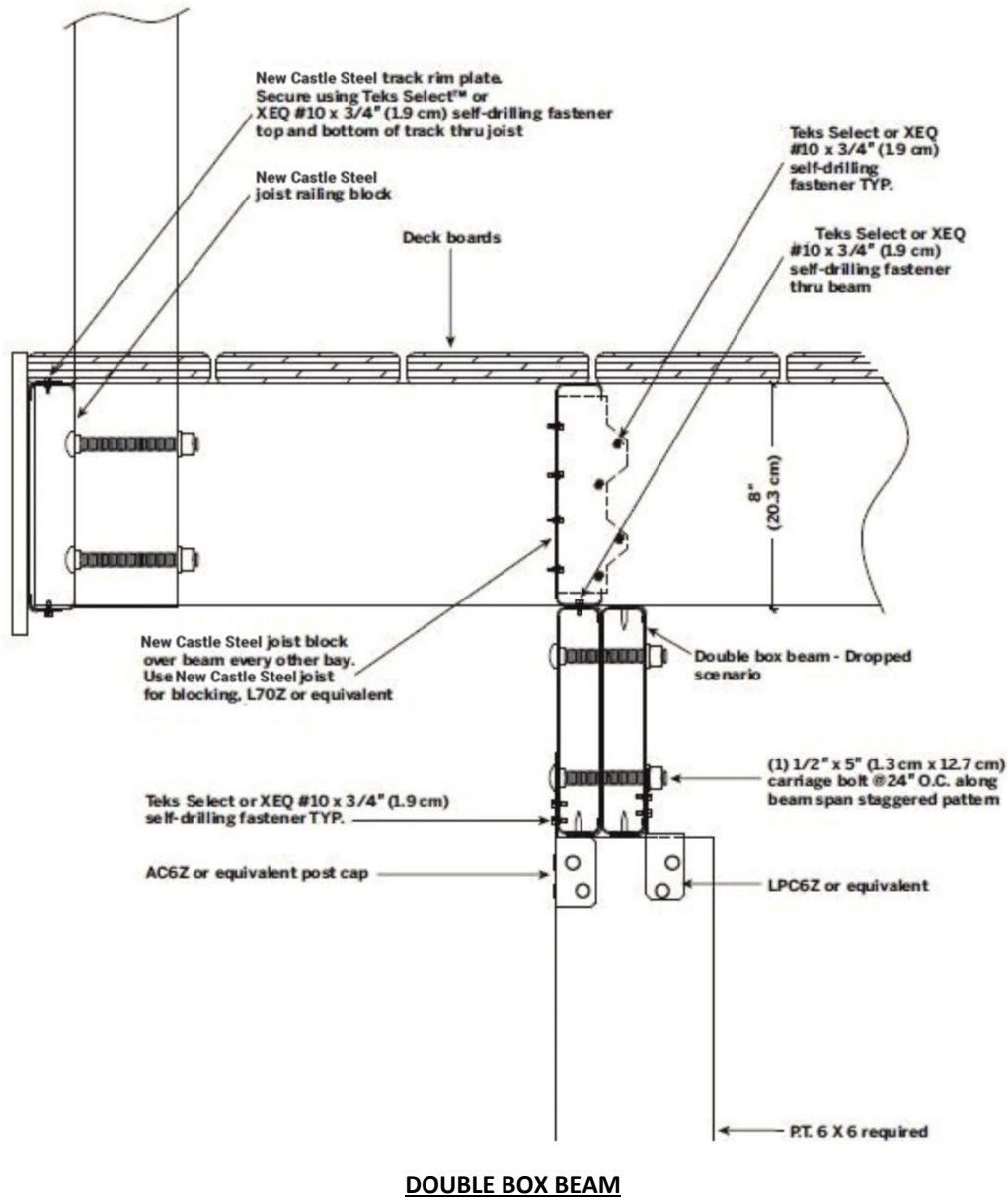
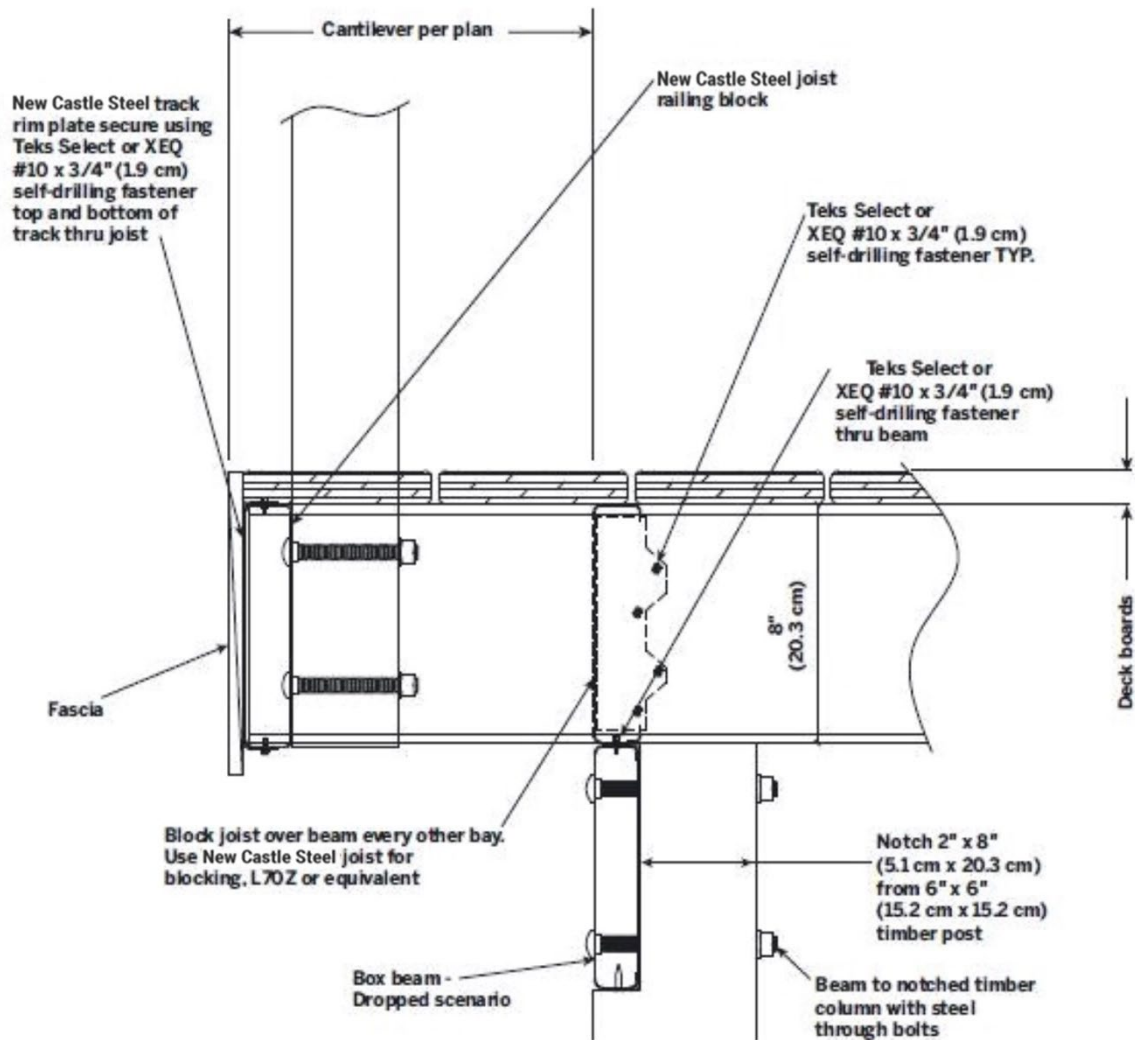


FIGURE 10 – BOX BEAM TO POST DETAIL – DROPPED BEAM CONSTRUCTION



**SINGLE BOX BEAM – 6X6 POST**

**FIGURE 10 – BOX BEAM TO POST DETAIL – DROPPED BEAM CONSTRUCTION (CONTINUED)**

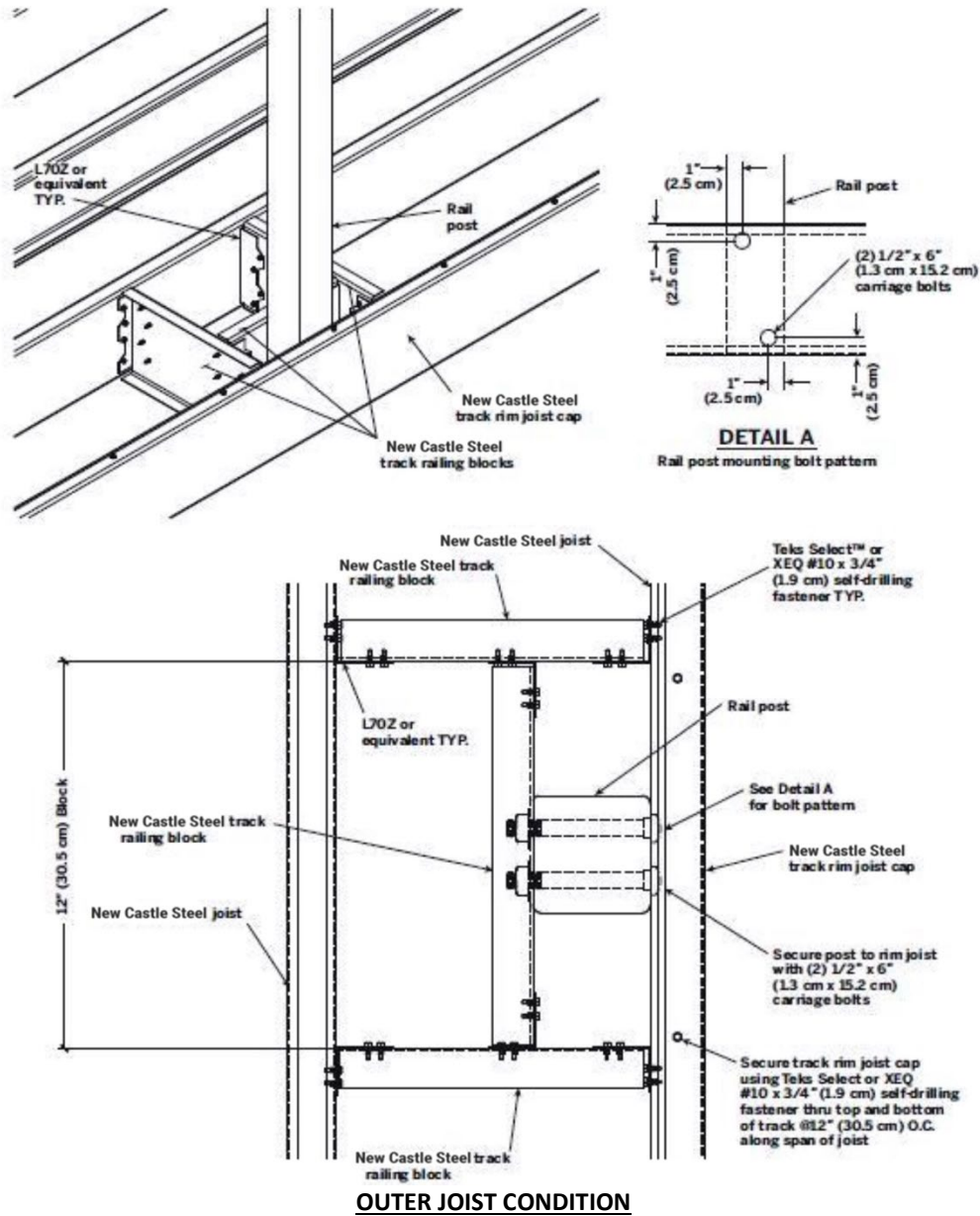


FIGURE 11 – RAIL POST INSTALLATION DETAILS



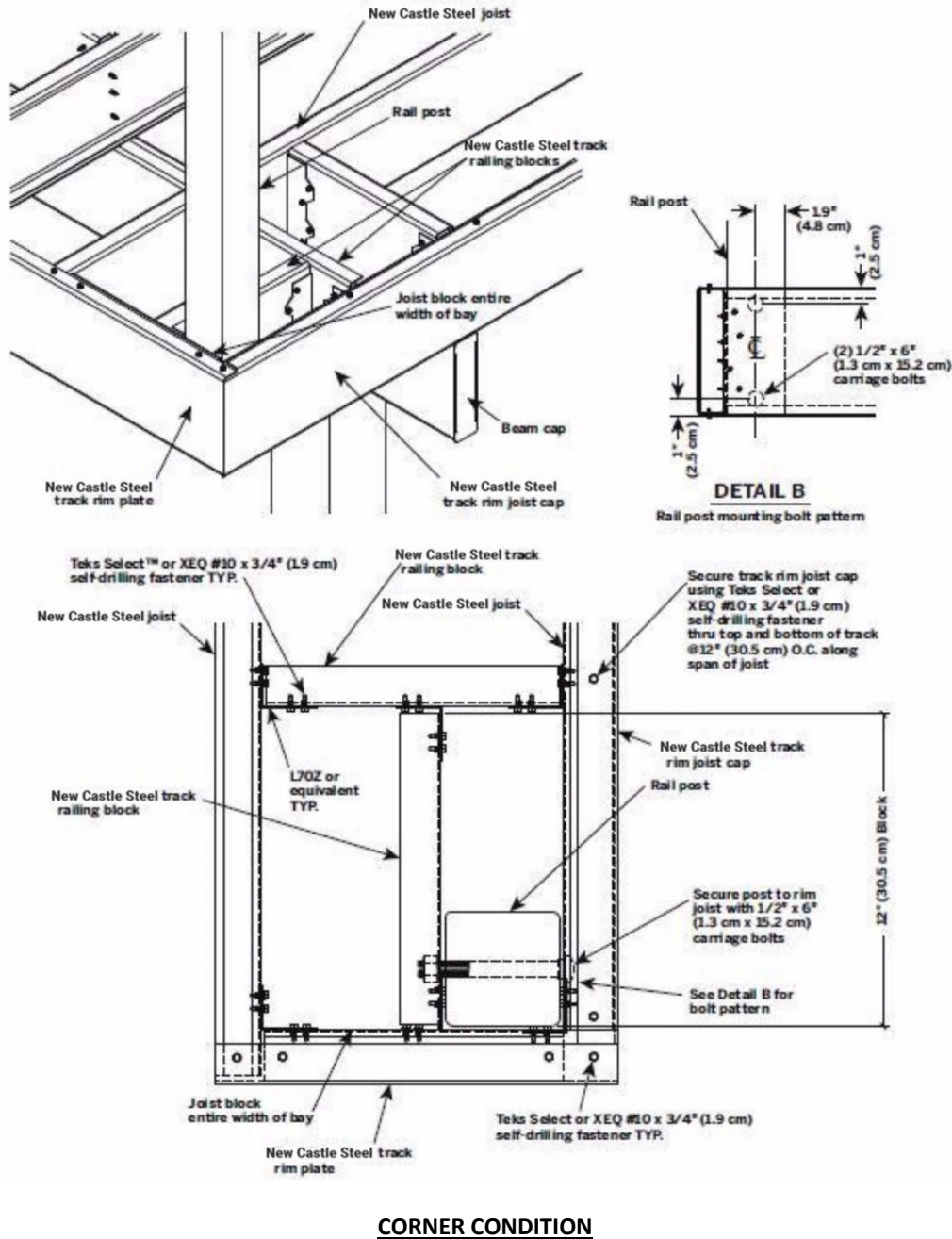
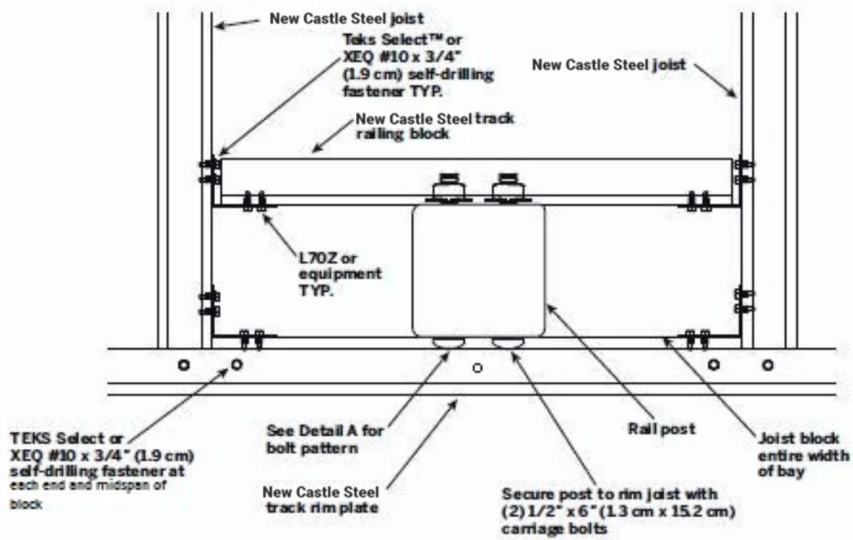
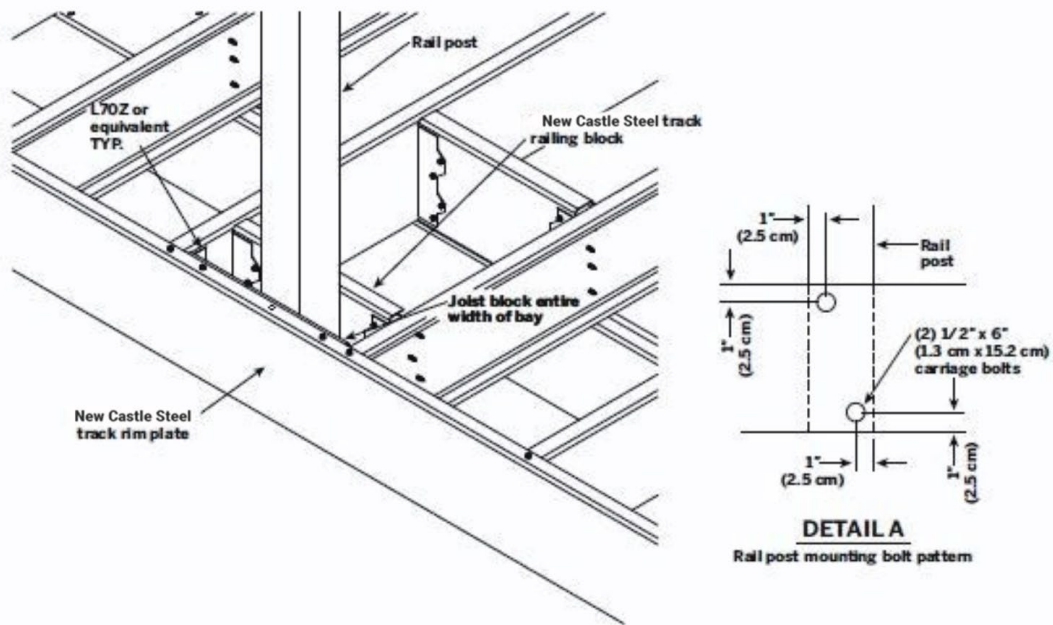


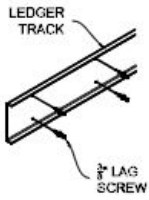
FIGURE 11 – RAIL POST INSTALLATION DETAILS (CONTINUED)



**FRONT PLATE CONDITION**

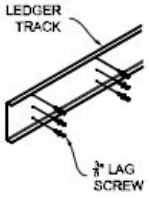
**FIGURE 11 – RAIL POST INSTALLATION DETAILS (CONTINUED)**

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"															
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"														
75 psf	24"							16"							
100 psf	24"					16"			14"						
Over 100 psf	Consult with your engineer or local building code official														

Requirements:

- 3/8" 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 3/4" inch
- The minimum length of unthreaded shank of the lag screws is 1/2" 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

TABLE 10 – NEW CASTLE STEEL DECK SYSTEM FASTENERS

Metal to Metal	Decking to Metal <sup>1</sup> – Face Attachment
Simpson Strong-Tie XEQ34B1016	FastenMaster® Cortex Driller™
ITW Buildex Tek Select™ P/N 1076000 (10-16 x 3/4" HWH Tek 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.