

Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	11 7/8" NI-40x	1	13
J1 DJ	16-00-00	11 7/8" NI-40x	2	4
J2	14-00-00	11 7/8" NI-40x	1	25
J2 DJ	14-00-00	11 7/8" NI-40x	2	4
J3	12-00-00	11 7/8" NI-40x	1	13
J3 DJ	12-00-00	11 7/8" NI-40x	2	4
J4	10-00-00	11 7/8" NI-40x	1	2
J5	6-00-00	11 7/8" NI-40x	1	4
J6	4-00-00	11 7/8" NI-40x	1	3
B3	14-00-00	1 3/4" x 11 7/8" (2.0E 3100) WestFraser LVL	2	2
B1	8-00-00	1 3/4" x 11 7/8" (2.0E 3100) WestFraser LVL	2	2
B13	8-00-00	1 3/4" x 11 7/8" (2.0E 3100) WestFraser LVL	2	2
B4	6-00-00	1 3/4" x 11 7/8" (2.0E 3100) WestFraser LVL	1	1
B5	6-00-00	1 3/4" x 11 7/8" (2.0E 3100) WestFraser LVL	1	1
B6	6-00-00	1 3/4" x 11 7/8" (2.0E 3100) WestFraser LVL	1	1
B7	4-00-00	1 3/4" x 11 7/8" (2.0E 3100) WestFraser LVL	2	2

Connector Summary		
Qty	Manuf	Product
3	H1	IUS2.56/11.88
12	H1	IUS2.56/11.88
6	H1	IUS2.56/11.88
6	H1	IUS2.56/11.88
2	H4	HUS1.81/10

DATE: 10/03/23

1st FLOOR FRAMING



FROM PLAN DATED: 2023-07-18  
BUILDER: GREENPARK HOMES  
SITE: Trinigroup Developments Inc.  
MODEL: VILLA 2  
ELEVATION: 1,2,3  
LOT:  
CITY: RICHMOND HILL  
SALESMAN: Rick DiCiano  
DESIGNER: PL  
REVISION:

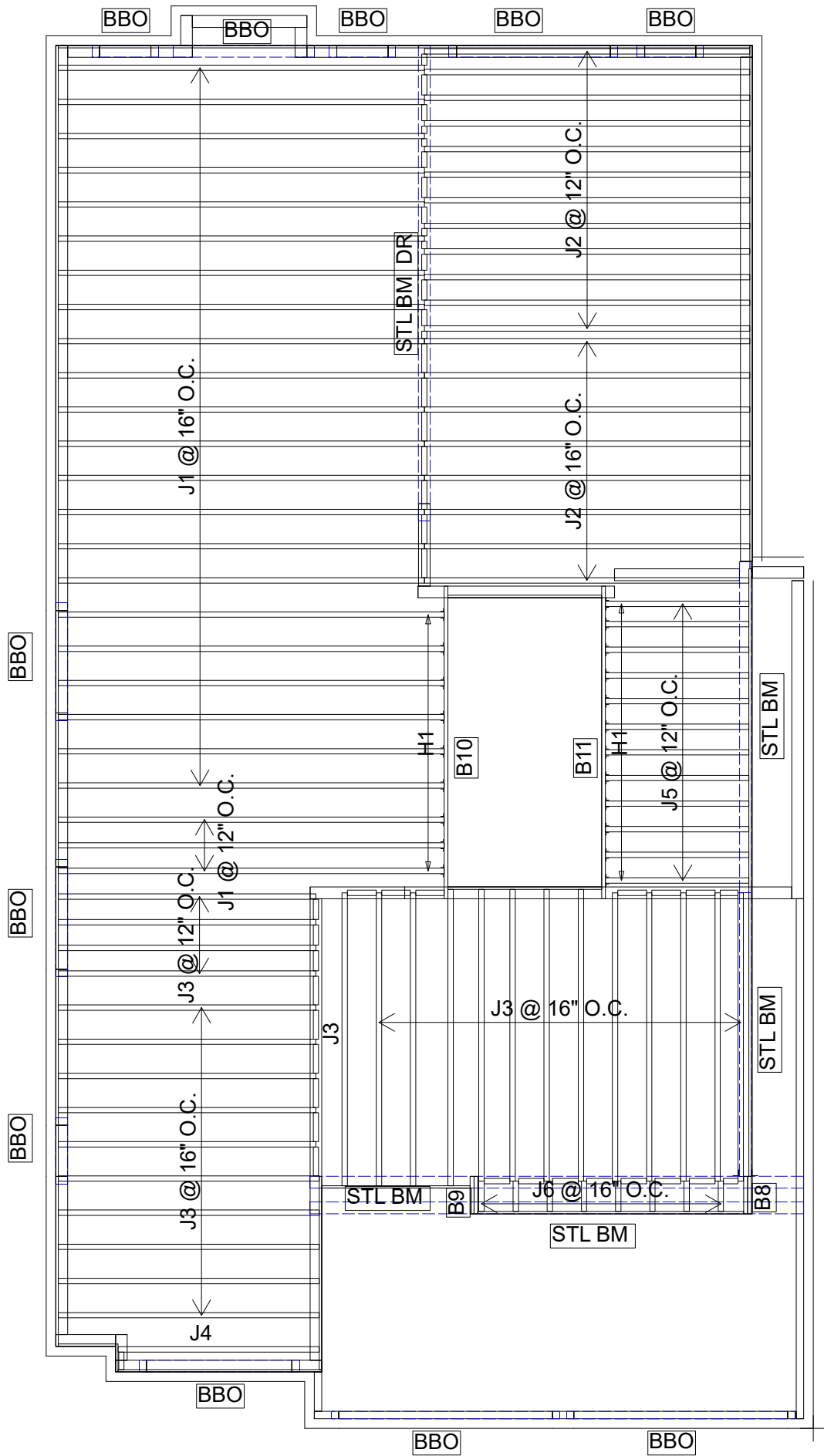
REFER TO THE NORDIC INSTALLATION GUIDE FOR PROPER STORAGE AND INSTALLATION.  
SQUASH BLOCKS OF 2x4, 2x6, 2x8 SPF #2 REQ'D UNDER INTERIOR UNIFORM LOAD BEARING WALLS.  
MULTIPLE SQUASH BLOCKS REQ'D UNDER CONCENTRATED LOADS. SEE FIGURE 1.  
CANTILEVERED JOISTS INCLUDING CANT' OVER BRICK REQ. I-JOIST BLOCKING ALONG BEARING AND RIMBOARD CLOSURE AT ENDS. SEE FIGURES 4/5 FOR REINFORCEMENT REQUIREMENTS.  
FOR HOLES INCLUDING DUCT CHASE AND FIELD CUT OPENINGS SEE FIGURE 6 AND TABLES 6.1/6.2.  
CERAMIC TILE APPLICATION AS PER OBC 9.30.6.

ALL CONNECTORS MUST BE INSTALLED AS PER THE MANUFACTURER'S SPECIFICATIONS USING THE MANUFACTURER SPECIFIED FASTENERS.  
ALL BEAM HANGER FASTENERS INSTALLED INTO THE SUPPORTING MEMBER MUST BE A MINIMUM OF 3.5" IN LENGTH UNLESS OTHERWISE SPECIFIED BY THE SUPPORTING MEMBER ENGINEER OF RECORD.

LOADING:  
LIVE LOAD: 40.0 lb/ft²  
DEAD LOAD: 15.0 lb/ft²  
TILE LOAD: +5.0 lb/ft²

JOIST LL DEFLECTION LIMIT: L/480  
SUBFLOOR: 3/4" GLUED AND NAILED

CITY OF RICHMOND HILL  
BUILDING DIVISION  
05/01/2024  
RECEIVED  
AND N/A



Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	11 7/8" NI-40x	1	25
J2	14-00-00	11 7/8" NI-40x	1	20
J3	12-00-00	11 7/8" NI-40x	1	27
J4	8-00-00	11 7/8" NI-40x	1	1
J5	6-00-00	11 7/8" NI-40x	1	12
J6	2-00-00	11 7/8" NI-40x	1	8
B10	14-00-00	1 3/4" x 11 7/8" (2.0E 3100) WestFraser LVL	1	1
B11	14-00-00	1 3/4" x 11 7/8" (2.0E 3100) WestFraser LVL	1	1
B8	2-00-00	1 3/4" x 11 7/8" (2.0E 3100) WestFraser LVL	2	2
B9	2-00-00	1 3/4" x 11 7/8" (2.0E 3100) WestFraser LVL	2	2

Connector Summary		
Qty	Manuf	Product
21	H1	IUS2.56/11.88

DATE: 2023-10-02

2nd FLOOR FRAMING



FROM PLAN DATED: 2023-07-18  
BUILDER: GREENPARK HOMES  
SITE: Trinigroup Developments Inc.  
MODEL: VILLA 2  
ELEVATION: 1,2,3  
LOT:  
CITY: RICHMOND HILL  
SALESMAN: Rick DiCiano  
DESIGNER: PL  
REVISION:

REFER TO THE NORDIC INSTALLATION GUIDE FOR PROPER STORAGE AND INSTALLATION.  
SQUASH BLOCKS OF 2x4, 2x6, 2x8 SPF #2 REQ'D UNDER INTERIOR UNIFORM LOAD BEARING WALLS.  
MULTIPLE SQUASH BLOCKS REQ'D UNDER CONCENTRATED LOADS. SEE FIGURE 1.  
CANTILEVERED JOISTS INCLUDING CANT' OVER BRICK REQ. I-JOIST BLOCKING ALONG BEARING AND RIMBOARD CLOSURE AT ENDS. SEE FIGURES 4/5 FOR REINFORCEMENT REQUIREMENTS.  
FOR HOLES INCLUDING DUCT CHASE AND FIELD CUT OPENINGS SEE FIGURE 6 AND TABLES 6.1/6.2.  
CERAMIC TILE APPLICATION AS PER OBC 9.30.6.

ALL CONNECTORS MUST BE INSTALLED AS PER THE MANUFACTURER'S SPECIFICATIONS USING THE MANUFACTURER SPECIFIED FASTENERS.  
ALL BEAM HANGER FASTENERS INSTALLED INTO THE SUPPORTING MEMBER MUST BE A MINIMUM OF 3.5" IN LENGTH UNLESS OTHERWISE SPECIFIED BY THE SUPPORTING MEMBER ENGINEER OF RECORD.

LOADING:  
LIVE LOAD: 40.0 lb/ft²  
DEAD LOAD: 15.0 lb/ft²  
TILE LOAD: +5.0 lb/ft²  
JOIST LL DEFLECTION LIMIT: L/480  
SUBFLOOR: 5/8" GLUED AND NAILED

CITY OF RICHMOND HILL  
BUILDING DIVISION  
05/01/2024  
RECEIVED  
AND NAILED

# NORDIC

## INSTALLATION GUIDE NORDIC JOIST

NS-G133   
ENGLISH  
VERSION  
2020-10-01

Engineered Wood Products

## BASIC INSTALLATION GUIDE FOR RESIDENTIAL FLOORS



NORDIC  
STRUCTURES

nordic.ca

### INSTALLING NORDIC I-JOISTS

1. Installation of Nordic I-joists shall be as shown in details 1.
2. Except for cutting to length, I-joist flanges should never be cut, drilled or notched.
3. Install I-joists so that top and bottom flanges are within 1/2 inch of true vertical alignment.
4. Concentrated loads should only be applied to the top surface of the top flange. Concentrated loads should not be suspended from the bottom flange with the exception of light loads, such as ceiling fans or light fixtures.
5. I-joists must be protected from the weather prior to installation.
6. I-joists must not be used in applications where they will be permanently exposed to weather, or will reach a moisture content of 15 percent or greater, such as in swimming pool or hot tub areas. They must not be installed where they will remain in direct contact with concrete or masonry.
7. End bearing length must be at least 1-3/4 inch. For multiple-span joists, intermediate bearing length must be at least 3-1/2 inches.
8. Ends of floor joists shall be restrained to prevent rollover. Use rim board or I-joist blocking panels.
9. I-joists installed beneath bearing walls perpendicular to the joists shall have full-depth blocking panels, rim board, or squash blocks (cripple blocks) to transfer gravity loads from above the floor system to the wall or foundation below.
10. For I-joists installed directly beneath bearing walls parallel to the joists or used as rim board or blocking panels, the maximum vertical load using a single I-joist is 3,300 plf, and 6,000 plf if double I-joists are used.
11. Continuous lateral support of the I-joist's compression flange is required to prevent rotation and buckling. In simple span uses, lateral support of the top flange is normally supplied by the floor sheathing. In multiple-span or cantilever applications, bracing of the I-joist's bottom flange is also required at interior supports of multiple-span joists, and at the end support next to the cantilever extension. The ends of all cantilever extensions must be laterally braced as shown in details 3, 4, or 5.
12. Nails installed in flange face or edge shall be spaced in accordance with the applicable building code requirements or approved building plans, but should not be closer than those specified on page 3.3 of the Nordic Joist Technical Guide (NS-GT3).
13. Details 1 show only I-joist-specific fastener requirements. For other fastener requirements, see the applicable building code.
14. For proper temporary bracing of wood I-joists and placement of temporary construction loads, see APA Technical Note: Temporary Construction Loads over I-Joist Roofs and Floors, Form J735.

All nails shown in the details are assumed to be common nails unless otherwise noted. Nails shall have a diameter not less than 0.128 inch for 2-1/2-inch nails, or 0.144 inch for 3-inch nails. Individual components not shown to scale for clarity.

### SAFETY AND CONSTRUCTION PRECAUTIONS

I-joists are not stable until completely installed, and will not carry any load until fully braced and sheathed.

#### Avoid Accidents by Following these Important Guidelines:

1. Brace and nail each I-joist as it is installed, using hangers, blocking panels, rim board, and/or cross-bridging at joist ends. When I-joists are applied continuous over interior supports and a load-bearing wall is planned at that location, blocking will be required at the interior support.
  2. When the building is completed, the floor sheathing will provide lateral support for the top flanges of the I-joists. Until this sheathing is applied, temporary bracing, often called struts, or temporary sheathing must be applied to prevent I-joist rollover or buckling.
    - Temporary bracing or struts must be 1x4 inch minimum, at least 8 feet long and spaced no more than 8 feet on centre, and must be secured with a minimum of two 2-1/2-inch nails fastened to the top surface of each I-joist. Nail the bracing to a lateral restraint at the end of each bay. Lap ends of adjoining bracing over at least two I-joists.
    - Or, sheathing (temporary or permanent) can be nailed to the top flange of the first 4 feet of I-joists at the end of the bay.
  3. For cantilevered I-joists, brace top and bottom flanges, and brace ends with closure panels, rim board, or cross-bridging.
  4. Install and fully nail permanent sheathing to each I-joist before placing loads on the floor system. Then, stack building materials over beams or walls only.
  5. Never install a damaged I-joist.
- Improper storage or installation, failure to follow applicable building codes, failure to follow span ratings for Nordic I-joists, failure to follow allowable hole sizes and locations, or failure to use web stiffeners when required can result in serious accidents. Follow these installation guidelines carefully.



Do not walk on I-joists until fully fastened and braced, or serious injuries can result.



Never stack building materials over unsheathed I-joists. Once sheathed, do not overstress I-joist with concentrated loads from building materials.

### NORDIC I-JOIST SERIES

#### RESIDENTIAL SERIES

<b>NI-20</b> <b>2x3</b> S-P-F No. 2 3/8 in. web
<b>Depths</b> 9-1/2 and 11-7/8 in.
33 pieces per unit

<b>NI-40x</b> <b>2x3</b> 1950F MSR 3/8 in. web
<b>Depths</b> 9-1/2, 11-7/8 and 14 in.
33 pieces per unit

<b>NI-60</b> <b>2x3</b> 2100F MSR 3/8 in. web
<b>Depths</b> 9-1/2, 11-7/8, 14 and 16 in.
33 pieces per unit

<b>NI-80</b> <b>2x4</b> 2400F MSR 3/8 in. web
<b>Depths</b> 11-7/8, 14 and 16 in.
23 pieces per unit

<b>NI-90</b> <b>2x4</b> 2400F MSR 3/8 in. web
<b>Depths</b> 11-7/8, 14 and 16 in.
23 pieces per unit

<b>RIM BOARDS</b>
<b>Width</b> 1-1/8 in.
<b>Length</b> 16 ft
<b>Depths</b> 9-1/2 to 16 in.
APA Rim Board Plus

### WEB STIFFENERS

**2**

**Concentrated Load (Load Stiffener)**

Tight joint, no gap

Gap

**End Bearing (Bearing Stiffener)**

Gap

Tight joint, no gap

Flange width 2-1/2" or 3-1/2"

Approx. 2"

1/8"-1/4" Gap

Four 2-1/2" nails, 3" nails required for I-joists with 3-1/2" flange width

No gap

**Stiffener Size Requirements**

Flange width (in.)	Web stiffener size each side of web (in.)
2-1/2	1 x 2-5/16 Minimum width
3-1/2	1-1/2 x 2-5/16 Minimum width

### NAIL SPACING

Nailing into flange face

Nailing into flange edge

**Nailed to Only One Flange Edge (Top View)**

Closest nail spacing

**Nailed to Both Flange Edges (Top View)**

Closest nail spacing

1/2 offset spacing <sup>(a)</sup>

**Recommended Closest Nail Spacing for Fastening Sheathing to I-joist Flanges to Minimize Splitting**

Fastener size (diameter x length)	Flange face nailing <sup>(a)</sup>			Flange edge nailing <sup>(a)</sup>		
	End distance (in.)	Nail spacing (in.)	End distance (in.)	Nail spacing (in.)	Nail spacing (in.)	
0.128" or smaller in diameter, and 3-1/4" or shorter in length	2	2	2	2	4	
					Nailed to both flange edges	
Greater than 0.128" up to 0.148" in diameter, and 3-1/4" or shorter in length	2	3	2	3	6	
					Nailed to both flange edges	

<sup>(a)</sup> If more than one row is required, offset rows a minimum of 1/2 inch and stagger.

<sup>(b)</sup> Closest nail spacing measured from one flange edge. Nails on opposite flange edge must be offset one-half the minimum spacing.

**1a**

Nordic I-joist blocking panel

2-1/2" nails at 6" o.c. to top plate (when used for lateral shear transfer, nail to bearing plate with same nailing as required for floor sheathing)

Attach I-joist to top plate per detail 1b

**1b**

Rim board

One 2-1/2" nail at top and bottom flange

Attach rim board to top plate using 2-1/2" toe-nails at 6" o.c.

One 2-1/2" face nail at each side at bearing

**Note:**  
1. To avoid splitting flange, start nails at least 1-1/2 inch from end of I-joist. Nails may be driven at an angle to avoid splitting of bearing plate.

**1g**

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

Blocking panel required over all interior supports under load-bearing walls or when floor joists are not continuous over support. The NBC requires blocking at load-bearing and non-load-bearing walls constructed with required braced wall panels (shearwalls).

Joist attachment per detail 1b

2-1/2" nails at 6" o.c. to top plate

Nordic I-joist blocking panel per detail 1a

**1h**

Use backer block if hanger load exceeds 360 lbf. Before installing a backer block to a double I-joist, drive three additional 3" nails through the webs and filler block where the backer block will fit. Clinch. Install backer block tight to top flange. Use twelve 3" nails, clinched when possible. Maximum resistance for hanger for this detail = 1,620 lbf.

Double I-joist header

Filler block per detail 1p

Top- or face-mount hanger

Backer block required:  
- Only on the loaded side for top-mount hangers  
- On both sides for face-mount hangers

Flange width (in.)	Material thickness required (in.) <sup>(a)</sup>	Minimum depth (in.) <sup>(b)</sup>
2-1/2	1	5-1/2
3-1/2	1-1/2	7-1/4

<sup>(a)</sup> Minimum grade for backer block material shall be S-P-F No. 2 or better for solid sawn lumber and wood structural panels conforming to CAN/CSA-Q325 Standard.

<sup>(b)</sup> For face-mount hangers use net joist depth minus 3-1/4 inches for joists with 1-1/2-inch-thick flanges.

**Notes:**  
1. Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.  
2. For hanger resistance, see manufacturer's recommendations.  
3. Verify double I-joist resistance to support concentrated loads.  
4. Backer blocks must be long enough to permit required nailing without splitting.

**1j**

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

**1k**

2x plate flush with inside face of wall or beam. 1/8" overhang allowed past inside face of wall or beam.

Top-mount hanger installed per manufacturer's recommendations

**1m**

Install hanger per manufacturer's recommendations

Multiple I-joist header with full depth filler block shown. Nordic Lam or SCL headers may also be used. Verify header resistance to support concentrated loads.

Backer block per detail 1h

**Note:**  
1. See detail 1h for maximum support resistance.

**1n**

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

Attach I-joist per detail 1b

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

**1p**

Filler block

Offset nails from opposite face by 6"

1/8" to 1/4" gap between top flange and filler block

**1q**

Filler block per detail 1p

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

**1r**

Blocking panel

Two 2-1/2" nails from blocking panel web to lumber piece

Two 2-1/2" nails from blocking panel web to lumber piece

**Notes:**  
1. This detail may be used to reduce floor vibration.  
2. Blocking panels may be of any I-joist series. Nails attaching lumber piece to I-joist web should be driven from the web side and clinched on the lumber side.  
3. One occasional blocking panel may be left out for the passage of plumbing or ventilation ducts. Otherwise, a hole of not more than 2/3 of the lesser dimension of the blocking depth or length may be drilled in the blocking panel.

**1s-1**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-2**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-3**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-4**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-5**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-6**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-7**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-8**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-9**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-10**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-11**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-12**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-13**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-14**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-15**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-16**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-17**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-18**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-19**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-20**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-21**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-22**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-23**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-24**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-25**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-26**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-27**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-28**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-29**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-30**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-31**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-32**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-33**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-34**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-35**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-36**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-37**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-38**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-39**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-40**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-41**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-42**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-43**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-44**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-45**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-46**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-47**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-48**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-49**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-50**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-51**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-52**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-53**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-54**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-55**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-56**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-57**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-58**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-59**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-60**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-61**

See note 2

1/8" gap minimum

One 2-1/2" nail at top and bottom flange

2-1/2" nails at 6" o.c.

One 2-1/2" nail, one side only

2x4 minimum

Blocking panel (note 1)

**1s-62**

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BUILDER: **GREENPARK HOMES**  
SITE: **Trinigroup Developments Inc.**  
MODEL: **VILLA 2**  
CITY: **RICHMOND HILL**

Job Name: **VILLA 2**  
Level: **2ND FLOOR**  
Label: **B9 - i859**  
Type: **Beam**

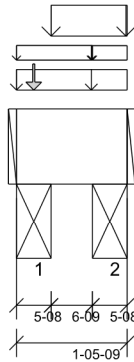
**2 Ply Member**  
**1 3/4" x 11 7/8" (2.0E 3100)**  
**WestFraser LVL**

Status:  
**Design Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version 8.6.3.353.Update16.11

Report Version: 2021.03.26 09/27/2023 07:46



#### DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)  
Design Methodology: LSD  
Service Condition: Dry  
LL Deflection Limit: L/360,  
TL Deflection Limit: L/240,

#### Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 0'- 6 9/16"

#### Factored Resistance of Support Material:

- 615 psi Beam @ 0'- 4 1/2"
- 615 psi Beam @ 1'- 1 1/16"

**PLY TO PLY CONNECTION:**  
**4 ROWS OF 3.25" PNEUMATIC GUN**  
**NAILS (0.120"x3.25") @ 4" O/C**

PLY TO PLY CONNECTION ASSUMES ANY  
SUPPORTED BEAM HANGERS ARE FASTENED  
TO THIS BEAM WITH MIN. 3.5" FASTENERS.

#### ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Moment:	1'- 1 1/16"	1.25D + 1.5S + L	1.00	49 lb ft	35345 lb ft	Passed - 0%
Factored Moment:				0 lb ft	0 lb ft	
Factored Moment:				0 lb ft	0 lb ft	
Factored Shear:	1'- 5 3/8"	1.25D + 1.5S + L	1.00	320 lb	13815 lb	Passed - 2%
Live Load (LL) Deflection:	0'- 8 3/4"	S + 0.5L		0.000"	L/360	Passed - L/999
Total Load (TL) Deflection:	0'- 9 1/4"	D + S + 0.5L		0.000"	L/240	Passed - L/999

#### SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	5-08	1.25D + 1.5S + L	1.00	485 lb		20020 lb	11839 lb	Passed - 4%
2	5-08	1.25D + 1.5S + L	1.00	520 lb		20020 lb	11839 lb	Passed - 4%

#### SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	1'- 5 9/16"	Self Weight	Top	12 lb/ft	-	-	-
Uniform	0'	1'- 5 9/16"	User Load	Top	60 lb/ft	-	77 lb/ft	-
Uniform	0'	1'- 1/16"	FC2 Floor Decking (Plan View Fill)	Top	4 lb/ft	8 lb/ft	-	-
Uniform	0'- 5 1/2"	1'- 5 9/16"	E43(i406)	Top	181 lb/ft	-	174 lb/ft	-
Uniform	1'- 1/16"	1'- 5 9/16"	FC2 Floor Decking (Plan View Fill)	Top	3 lb/ft	6 lb/ft	-	-
Point	0'- 2 3/4"	0'- 2 3/4"	E63(i422)	Top	62 lb	-	80 lb	-

#### UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'- 5 1/2"	STL BM (i380)	191 lb	6 lb	216 lb	-
2	1'- 1/16"	1'- 5 9/16"	STL BM (i379)	164 lb	5 lb	152 lb	-

#### DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Lateral stability factor (KL) was based on user preference to use the width of all plies. (Consult with manufacturer for guideline pertaining to this design option.)
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

#### PLY TO PLY CONNECTION

- Member design assumed proper ply to ply connection by others. Fastener spacing along length of member must not exceed 4 times depth of member. Verify connection between plies according to code specification and follow the manufacturer's installation instruction. Loads assumed to be distributed equally to each ply.



STRUCTURAL COMPONENT ONLY  
DWG # TF23091211

**RECEIVED**  
Per: joshua.nabua



BUILDER: **GREENPARK HOMES**  
SITE: **Trinigroup Developments Inc.**  
MODEL: **VILLA 2**  
CITY: **RICHMOND HILL**

Job Name: **VILLA 2**  
Level: **2ND FLOOR**  
Label: **B10 - i994**  
Type: **Beam**

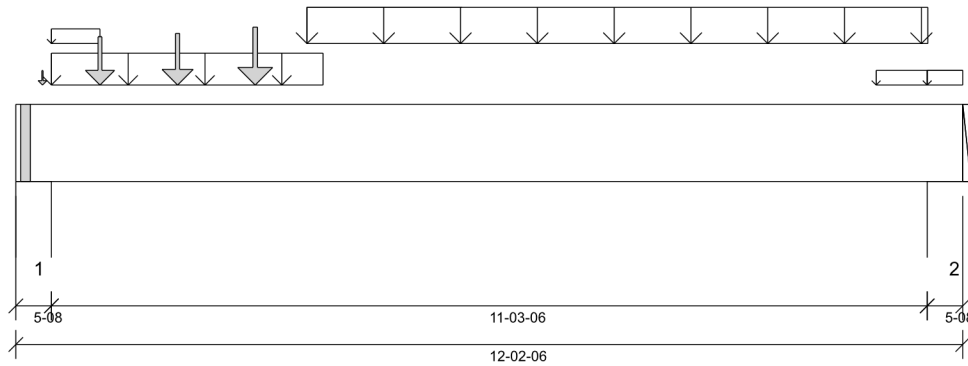
**1 Ply Member**  
**1 3/4" x 11 7/8" (2.0E 3100)**  
**WestFraser LVL**

Status:  
**Design Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version  
8.6.3.353.Update16.11

Report Version: 2021.03.26 09/27/2023 07:46



### DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)  
Design Methodology: LSD  
Service Condition: Dry  
LL Deflection Limit: L/360,  
TL Deflection Limit: L/240,

#### Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 1'- 1 1/2"

#### Factored Resistance of Support Material:

- 615 psi Wall @ 0'- 4 1/2"
- 615 psi Wall @ 11'- 9 7/8"

### ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	5'- 9"	1.25D + 1.5L	1.00	12378 lb ft	17672 lb ft	Passed - 70%
Factored Shear:	1'- 5 3/8"	1.25D + 1.5L	1.00	4865 lb	6908 lb	Passed - 70%
Live Load (LL) Pos. Defl.:	6'	L		0.288"	L/360	Passed - L/469
Total Load (TL) Pos. Defl.:	6'	D + L		0.437"	L/240	Passed - L/309
Permanent Deflection:	6'			-	L/360	Passed - L/935

### SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	5-08	1.25D + 1.5L	1.00	5030 lb		10010 lb	5921 lb	Passed - 85%
2	5-08	1.25D + 1.5L	1.00	3939 lb		10010 lb	5921 lb	Passed - 67%

### SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	12'- 2 3/8"	Self Weight	Top	6 lb/ft	-	-	-
Uniform	0'- 5 1/2"	3'- 11 1/2"	User Load	Front	120 lb/ft	240 lb/ft	-	-
Uniform	0'- 5 1/2"	1'- 1"	FC2 Floor Decking (Plan View Fill)	Top	2 lb/ft	3 lb/ft	-	-
Uniform	11'- 1"	11'- 8 7/8"	FC2 Floor Decking (Plan View Fill)	Top	2 lb/ft	3 lb/ft	-	-
Uniform	11'- 8 7/8"	12'- 2 3/8"	FC2 Floor Decking (Plan View Fill)	Top	2 lb/ft	4 lb/ft	-	-
Tapered	3'- 9"	11'- 9"	Smoothed Load	Back	151 To 150 lb/ft	301 To 300 lb/ft	-	-
Point	1'- 1"	1'- 1"	J1(i710)	Back	137 lb	274 lb	-	-
Point	2'- 1"	2'- 1"	J1(i729)	Back	150 lb	301 lb	-	-
Point	3'- 1"	3'- 1"	J1(i746)	Back	176 lb	351 lb	-	-
Point	0'- 4 1/8"	0'- 4 1/8"	FC2 Floor Decking (Plan View Fill)	Top	0 lb	1 lb	-	-

### UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'- 5 1/2"	1(i284)	1210 lb	2346 lb	-	-
2	11'- 8 7/8"	12'- 2 3/8"	5(i323)	953 lb	1831 lb	-	-

### DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- Beam Stability Factor used in the calculation for Allowable Max Pos Moment (KL) = 1.00
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.



STRUCTURAL COMPONENT ONLY  
DWG # TF23091212

CITY OF RICHMOND HILL  
BUILDING DIVISION  
05/01/2024  
RECEIVED  
Per: joshua.nabua



BUILDER: **GREENPARK HOMES**  
SITE: **Trinigroup Developments Inc.**  
MODEL: **VILLA 2**  
CITY: **RICHMOND HILL**

Job Name: **VILLA 2**  
Level: **2ND FLOOR**  
Label: **B11 - i996**  
Type: **Beam**

**1 Ply Member**  
**1 3/4" x 11 7/8" (2.0E 3100)**  
**WestFraser LVL**

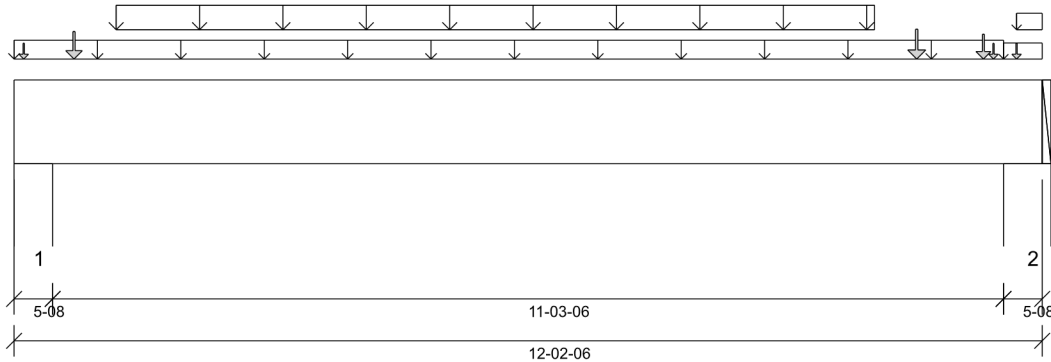
Status:  
**Design Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version  
8.6.3.353.Update16.11

Report Version: 2021.03.26

09/27/2023 07:46



### DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)  
Design Methodology: LSD  
Service Condition: Dry  
LL Deflection Limit: L/360,  
TL Deflection Limit: L/240,

#### Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 0'- 9 1/2"

#### Factored Resistance of Support Material:

- 615 psi Wall @ 0'- 4 1/2"
- 615 psi Wall @ 11'- 9 7/8"

### ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	5'- 9 5/16"	1.25D + 1.5L	0.98	5226 lb ft	17261 lb ft	Passed - 30%
Factored Shear:	1'- 5 3/8"	1.25D + 1.5L	0.98	1725 lb	6747 lb	Passed - 26%
Live Load (LL) Pos. Defl.:	6'- 1 3/16"	L		0.091"	L/360	Passed - L/999
Total Load (TL) Pos. Defl.:	6'- 1 3/16"	D + L		0.190"	L/240	Passed - L/713

### SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	5-08	1.25D + 1.5L	0.98	1849 lb		9777 lb	5783 lb	Passed - 32%
2	5-08	1.25D + 1.5L	0.98	1811 lb		9777 lb	5783 lb	Passed - 31%

### SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	12'- 2 3/8"	Self Weight	Top	6 lb/ft	-	-	-
Uniform	0'	11'- 8 7/8"	User Load	Top	60 lb/ft	-	-	-
Uniform	1'- 2 9/16"	10'- 2 9/16"	Smoothed Load	Front	56 lb/ft	112 lb/ft	-	-
Uniform	11'- 8 7/8"	12'- 2 3/8"	FC2 Floor Decking (Plan View Fill)	Top	2 lb/ft	4 lb/ft	-	-
Uniform	11'- 10 3/4"	12'- 2 3/8"	FC2 Floor Decking (Plan View Fill)	Top	5 lb/ft	10 lb/ft	-	-
Point	0'- 8 9/16"	0'- 8 9/16"	J5(i870)	Front	42 lb	84 lb	-	-
Point	10'- 8 9/16"	10'- 8 9/16"	J5(i818)	Front	50 lb	100 lb	-	-
Point	11'- 6 1/16"	11'- 6 1/16"	J5(i773)	Front	32 lb	65 lb	-	-
Point	0'- 1 3/8"	0'- 1 3/8"	FC2 Floor Decking (Plan View Fill)	Top	1 lb	2 lb	-	-
Point	11'- 7 1/2"	11'- 7 1/2"	FC2 Floor Decking (Plan View Fill)	Top	0 lb	1 lb	-	-
Point	11'- 10 3/4"	11'- 10 3/4"	FC2 Floor Decking (Plan View Fill)	Top	1 lb	1 lb	-	-

### UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'- 5 1/2"	1(i284)	719 lb	633 lb	-	-
2	11'- 8 7/8"	12'- 2 3/8"	5(i323)	690 lb	632 lb	-	-

### DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- Beam Stability Factor used in the calculation for Allowable Max Pos Moment (KL) = 1.00
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.



STRUCTURAL COMPONENT ONLY  
DWG # TF23091213

OFFICE OF THE BUILDING DIVISION  
05/01/2024  
RECEIVED  
Per: joshua.nabua





BUILDER: **GREENPARK HOMES**  
SITE: **Trinigroup Developments Inc.**  
MODEL: **VILLA 2**  
CITY: **RICHMOND HILL**

Job Name: **VILLA 2**  
Level: **1ST FLOOR**  
Label: **B13 - i1446**  
Type: **Beam**

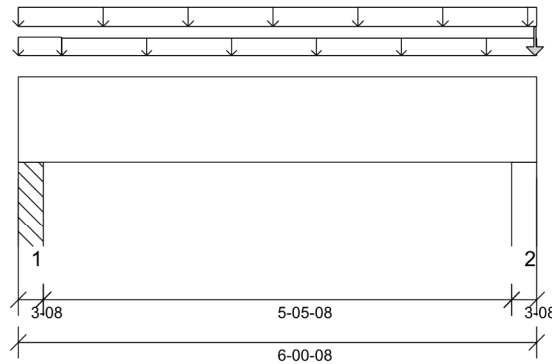
**2 Ply Member**  
**1 3/4" x 11 7/8" (2.0E 3100)**  
**WestFraser LVL**

Status:  
**Design Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version 8.6.3.353.Update16.11

Report Version: 2021.03.26 10/03/2023 14:32



#### DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)

Design Methodology: LSD

Service Condition: Dry

LL Deflection Limit: L/360,

TL Deflection Limit: L/240,

#### Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 5'- 9"

#### Factored Resistance of Support Material:

- 615 psi Column @ 0'- 2 1/2"
- 615 psi Wall @ 5'- 10"

#### ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	2'- 11 11/16"	1.25D + 1.5L	0.68	485 lb ft	23878 lb ft	Passed - 2%
Factored Shear:	4'- 9 1/8"	1.25D + 1.5L	0.68	227 lb	9333 lb	Passed - 2%

#### SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	3-08	1.25D + 1.5L	0.68	393 lb		8607 lb	5090 lb	Passed - 8%
2	3-08	1.25D + 1.5L	0.68	562 lb		8607 lb	5091 lb	Passed - 11%

#### SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	6'- 1/2"	Self Weight	Top	12 lb/ft	-	-	-
Uniform	0'	6'- 1/2"	User Load	Top	60 lb/ft	-	-	-
Uniform	-0'	0'- 6 1/16"	FC1 Floor Decking (Plan View Fill)	Top	15 lb/ft	31 lb/ft	-	-
Uniform	0'- 6 1/16"	6'- 1/2"	FC1 Floor Decking (Plan View Fill)	Top	9 lb/ft	18 lb/ft	-	-
Point	6'- 1/4"	6'- 1/4"	FC1 Floor Decking (Plan View Fill)	Top	111 lb	22 lb	-	-

#### UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'- 3 1/2"	PBO4(i53)	248 lb	63 lb	-	-
2	5'- 9"	6'- 1/2"	W20(i38)	353 lb	72 lb	-	-

#### DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Lateral stability factor (KL) was based on user preference to use the width of all plies. (Consult with manufacturer for guideline pertaining to this design option.)
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- Beam Stability Factor used in the calculation for Allowable Max Pos Moment (KL) = 1.00
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

#### PLY TO PLY CONNECTION

- Member design assumed proper ply to ply connection by others. Fastener spacing along length of member must not exceed 4 times depth of member. Verify connection between plies according to code specification and follow the manufacturer's installation instruction. Loads assumed to be distributed equally to each ply.



STRUCTURAL COMPONENT ONLY  
DWG # TF23100084

CITY OF RICHMOND HILL  
BUILDING DIVISION

05/01/2024

RECEIVED  
Per: joshua.nabua



BUILDER: **GREENPARK HOMES**  
SITE: **Trinigroup Developments Inc.**  
MODEL: **VILLA 2**  
CITY: **RICHMOND HILL**

Job Name: **VILLA 2**  
Level: **1ST FLOOR**  
Label: **B1 - i993**  
Type: **Beam**

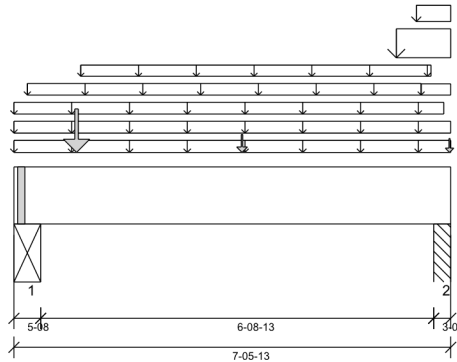
**2 Ply Member**  
**1 3/4" x 11 7/8" (2.0E 3100)**  
**WestFraser LVL**

Status:  
**Design Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version 8.6.3.353.Update16.11

Report Version: 2021.03.26 09/27/2023 07:46



### DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)  
Design Methodology: LSD  
Service Condition: Dry  
LL Deflection Limit: L/360,  
TL Deflection Limit: L/240,

#### Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 7'- 5/16"

#### Factored Resistance of Support Material:

- 615 psi Beam @ 0'- 4 1/2"
- 615 psi Column @ 7'- 3 5/16"

**PLY TO PLY CONNECTION:**  
**4 ROWS OF 3.25" PNEUMATIC GUN NAILS (0.120"x3.25") @ 12" O/C**

PLY TO PLY CONNECTION ASSUMES ANY SUPPORTED BEAM HANGERS ARE FASTENED TO THIS BEAM WITH MIN. 3.5" FASTENERS.

### ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	3'- 10 7/8"	1.25D + 1.5L	0.96	5082 lb ft	33961 lb ft	Passed - 15%
Factored Shear:	1'- 5 3/8"	1.25D + 1.5L	0.96	3360 lb	13274 lb	Passed - 25%
Live Load (LL) Pos. Defl.:	3'- 7 11/16"	L		0.015"	L/360	Passed - L/999
Total Load (TL) Pos. Defl.:	3'- 8 1/2"	D + L		0.034"	L/240	Passed - L/999

### SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	5'-08	1.25D + 1.5L	0.96	5319 lb		19236 lb	11375 lb	Passed - 47%
2	3'-08	1.25D + 1.5L	0.96	4228 lb		12241 lb	7239 lb	Passed - 58%

### SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	7'- 5 13/16"	Self Weight	Top	12 lb/ft	-	-	-
Uniform	-0'	7'- 5 13/16"	5(i323)	Top	81 lb/ft	-	-	-
Uniform	0'	7'- 5 13/16"	User Load	Top	60 lb/ft	-	-	-
Uniform	0'	7'- 4 3/8"	5(i323)	Top	60 lb/ft	-	-	-
Uniform	0'- 2 3/4"	6'- 11 11/16"	FC1 Floor Decking (Plan View Fill)	Top	13 lb/ft	27 lb/ft	-	-
Uniform	1'- 1 3/4"	7'- 1 3/4"	5(i323)	Top	10 lb/ft	14 lb/ft	-	-
Uniform	6'- 6 5/8"	7'- 5 13/16"	5(i323)	Top	632 lb/ft	579 lb/ft	-	-
Uniform	6'- 10 11/16"	7'- 5 13/16"	5(i323)	Top	294 lb/ft	68 lb/ft	-	-
Uniform	6'- 11 11/16"	7'- 5 13/16"	FC1 Floor Decking (Plan View Fill)	Top	9 lb/ft	18 lb/ft	-	-
Point	1'- 7/8"	1'- 7/8"	5(i323)	Top	953 lb	1831 lb	-	-
Point	3'- 10 7/8"	3'- 10 7/8"	User Load	Top	200 lb	400 lb	-	-
Point	7'- 5 9/16"	7'- 5 9/16"	5(i323)	Top	161 lb	104 lb	-	-

### UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'- 5 1/2"	STL BM (i45)	1859 lb	1975 lb	-	-
2	7'- 2 5/16"	7'- 5 13/16"	PBO3(i52)	1955 lb	1210 lb	-	-

### DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Lateral stability factor (KL) was based on user preference to use the width of all plies. (Consult with manufacturer for guideline pertaining to this design option.)
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- Beam Stability Factor used in the calculation for Allowable Max Pos Moment (KL) = 1.00
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.
- Bearing capacity of member at support 1, 2 was verified for the effect of concentrated load applied near the support. At support 1. Required Load Area: L=1.500", W=3.500". LDF=0.96, Pf=4098 lb, Q'=5460 lb, Result=75.06%.

### PLY TO PLY CONNECTION



STRUCTURAL COMPONENT ONLY  
DWG # TF23091215  
PG 1/2

CITY OF RICHMOND HILL  
BUILDING DIVISION  
09/27/2024

RECEIVED  
Per: joshua.nabua

	BUILDER:	GREENPARK HOMES	Job Name:	VILLA 2	2 Ply Member	Status:
	SITE:	Trinigroup Developments Inc.	Level:	1ST FLOOR	1 3/4" x 11 7/8" (2.0E 3100) WestFraser LVL	Design Passed
	MODEL:	VILLA 2	Label:	B1 - i993		
	CITY:	RICHMOND HILL	Type:	Beam		

PLY TO PLY CONNECTION

- Member design assumed proper ply to ply connection by others. Fastener spacing along length of member must not exceed 4 times depth of member. Verify connection between plies according to code specification and follow the manufacturer's installation instruction. Loads assumed to be distributed equally to each ply.



CITY OF RICHMOND HILL  
BUILDING DIVISION  
  
05/01/2024  
  
RECEIVED  
Per: joshua.nabua





BUILDER: **GREENPARK HOMES**  
SITE: **Trinigroup Developments Inc.**  
MODEL: **VILLA 2**  
CITY: **RICHMOND HILL**

Job Name: **VILLA 2**  
Level: **1ST FLOOR**  
Label: **B3 - i886**  
Type: **Beam**

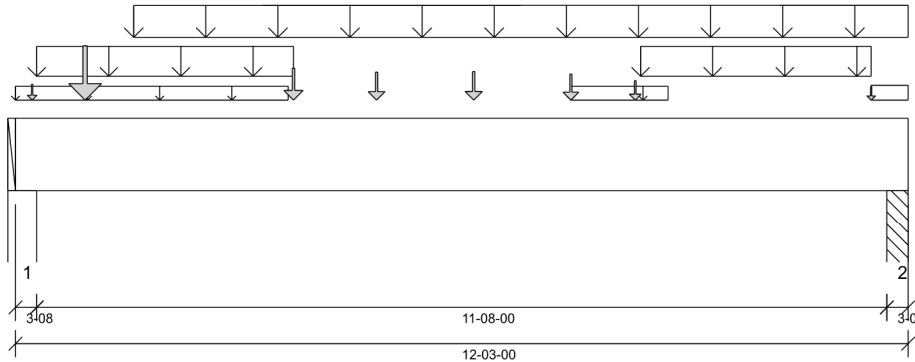
**2 Ply Member**  
**1 3/4" x 11 7/8" (2.0E 3100)**  
**WestFraser LVL**

Status:  
**Design Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version  
8.6.3.353.Update16.11

Report Version: 2021.03.26 09/27/2023 07:46



### DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)  
Design Methodology: LSD  
Service Condition: Dry  
LL Deflection Limit: L/360,  
TL Deflection Limit: L/240,

#### Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 1'- 1 1/2"

#### Factored Resistance of Support Material:

- 615 psi Wall @ 0'- 2 1/2"
- 615 psi Column @ 12'- 1/2"

**PLY TO PLY CONNECTION:**  
**4 ROWS OF 3.25" PNEUMATIC GUN**  
**NAILS (0.120"x3.25") @ 12" O/C**

PLY TO PLY CONNECTION ASSUMES ANY  
SUPPORTED BEAM HANGERS ARE FASTENED  
TO THIS BEAM WITH MIN. 3.5" FASTENERS.

### ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	6'- 3 7/16"	1.25D + 1.5L	1.00	16158 lb ft	35345 lb ft	Passed - 46%
Factored Shear:	10'- 11 5/8"	1.25D + 1.5L	1.00	5407 lb	13815 lb	Passed - 39%
Live Load (LL) Pos. Defl.:	6'- 1 7/16"	L		0.197"	L/360	Passed - L/711
Total Load (TL) Pos. Defl.:	6'- 1 5/16"	D + L		0.308"	L/240	Passed - L/453

### SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	3-08	1.25D + 1.5L	1.00	5832 lb		12740 lb	7536 lb	Passed - 77%
2	3-08	1.25D + 1.5L	1.00	5842 lb		12740 lb	7534 lb	Passed - 78%

### SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	12'- 3"	Self Weight	Top	12 lb/ft	-	-	-
Uniform	-0'	3'- 8 15/16"	FC1 Floor Decking (Plan View Fill)	Top	3 lb/ft	6 lb/ft	-	-
Uniform	0'- 3 1/2"	3'- 9 13/16"	User Load	Top	120 lb/ft	240 lb/ft	-	-
Uniform	7'- 7 7/16"	8'- 11 7/16"	FC1 Floor Decking (Plan View Fill)	Top	3 lb/ft	6 lb/ft	-	-
Uniform	8'- 6 15/16"	11'- 8 7/8"	User Load	Top	120 lb/ft	240 lb/ft	-	-
Uniform	11'- 8 7/8"	12'- 3"	FC1 Floor Decking (Plan View Fill)	Top	9 lb/ft	18 lb/ft	-	-
Tapered	1'- 7 7/16"	12'- 3"	Smoothed Load	Back	135 To 136 lb/ft	269 To 272 lb/ft	-	-
Point	3'- 9 13/16"	3'- 9 13/16"	B6(i957)	Front	170 lb	56 lb	-	-
Point	4'- 11 7/16"	4'- 11 7/16"	J5(i916)	Front	59 lb	119 lb	-	-
Point	6'- 3 7/16"	6'- 3 7/16"	J5(i931)	Front	62 lb	124 lb	-	-
Point	7'- 7 7/16"	7'- 7 7/16"	J5(i898)	Front	52 lb	104 lb	-	-
Point	8'- 6 1/16"	8'- 6 1/16"	B4(i885)	Front	33 lb	41 lb	-	-
Point	0'- 11 7/16"	0'- 11 7/16"	J2(i975)	Back	168 lb	336 lb	-	-
Point	0'- 2 3/4"	0'- 2 3/4"	3(i317)	Top	26 lb	5 lb	-	-
Point	11'- 8 7/8"	11'- 8 7/8"	FC1 Floor Decking (Plan View Fill)	Top	0 lb	1 lb	-	-

### UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'- 3 1/2"	W16(i28)	1512 lb	2623 lb	-	-
2	11'- 11 1/2"	12'- 3"	PBO2(i44)	1465 lb	2678 lb	-	-

### DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Lateral stability factor (KL) was based on user preference to use the width of all plies. (Consult with manufacturer for guideline pertaining to this design option.)
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- Beam Stability Factor used in the calculation for Allowable Max Pos Moment (KL) = 1.00
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.
- Bearing length at support 1 was calculated based on the actual bearing area divided by the supported member width and may not match expected value when bearing is not rectangular or when the supported member is not supported by its full width.



STRUCTURAL COMPONENT ONLY  
DWG # TF23091216 PG 1/2

CITY OF RICHMOND HILL  
05/01/2024  
RECEIVED  
Per: joshua.nabua

	BUILDER:	<b>GREENPARK HOMES</b>	Job Name:	<b>VILLA 2</b>	<b>2 Ply Member</b> <b>1 3/4" x 11 7/8" (2.0E 3100)</b> <b>WestFraser LVL</b>	Status: <b>Design Passed</b>
	SITE:	<b>Trinigroup Developments Inc.</b>	Level:	<b>1ST FLOOR</b>		
	MODEL:	<b>VILLA 2</b>	Label:	<b>B3 - i886</b>		
	CITY:	<b>RICHMOND HILL</b>	Type:	<b>Beam</b>		

**PLY TO PLY CONNECTION**

- Member design assumed proper ply to ply connection by others. Fastener spacing along length of member must not exceed 4 times depth of member. Verify connection between plies according to code specification and follow the manufacturer's installation instruction. Loads assumed to be distributed equally to each ply.



CITY OF RICHMOND HILL  
BUILDING DIVISION

05/01/2024

RECEIVED  
Per: joshua.nabua



BUILDER: **GREENPARK HOMES**  
SITE: **Trinigroup Developments Inc.**  
MODEL: **VILLA 2**  
CITY: **RICHMOND HILL**

Job Name: **VILLA 2**  
Level: **1ST FLOOR**  
Label: **B4 - i885**  
Type: **Beam**

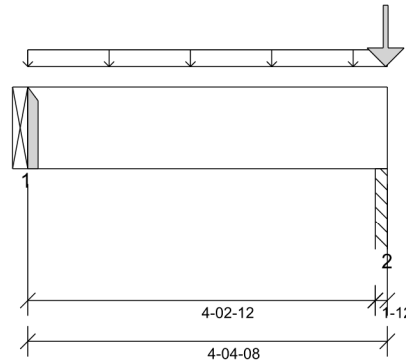
**1 Ply Member**  
**1 3/4" x 11 7/8" (2.0E 3100)**  
**WestFraser LVL**

Status:  
**Design Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version 8.6.3.353.Update16.11

Report Version: 2021.03.26 09/27/2023 07:46



### DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)

Design Methodology: LSD

Service Condition: Dry

LL Deflection Limit: L/360,

TL Deflection Limit: L/240,

#### Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 4'- 4 1/2"

#### Factored Resistance of Support Material:

- 615 psi Beam @ 0'
- 615 psi Column @ 4'- 3 3/4"

### ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	1'- 10 1/4"	1.25D + 1.5L	1.00	83 lb ft	17672 lb ft	Passed - 0%
Factored Neg. Moment:	4'- 3 3/4"	1.25D + 1.5L	1.00	62 lb ft	10260 lb ft	Passed - 1%
Factored Shear:	3'- 2 7/8"	1.25D + 1.5L	1.00	67 lb	6908 lb	Passed - 1%

### SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	1-08	1.25D + 1.5L	1.00	89 lb		2730 lb	-	Passed - 3%
2	1-12	1.25D + 1.5L	1.00	1614 lb		3185 lb	1883 lb	Passed - 86%

### CONNECTOR INFORMATION

ID	Part No.	Manufacturer	Nailing Requirements			Other Information or Requirement for Reinforcement Accessories
			Top	Face	Member	
1	HUS1.81/10		-	-	-	Connector manually specified by the user.

\* Connectors: Refer to manufacturer's specifications, fasteners requirements and installation instruction. Where header fasteners are longer than the width of the supporting member, install backer block or clinch header nails.

### SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	4'- 4 1/2"	Self Weight	Top	6 lb/ft	-	-	-
Uniform	0'	4'- 4 1/2"	FC1 Floor Decking (Plan View Fill)	Top	10 lb/ft	19 lb/ft	-	-
Point	4'- 4 1/4"	4'- 4 1/4"	User Load	Top	350 lb	700 lb	-	-

### UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'	B3(i886)	33 lb	41 lb	-	-
2	4'- 2 3/4"	4'- 4 1/2"	PBO5(i54)	386 lb	745 lb	-	-

### DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- Beam Stability Factor used in the calculation for Allowable Max Pos Moment (KL) = 1.00
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.



STRUCTURAL COMPONENT ONLY  
DWG # TF23091217

CITY OF RICHMOND HILL  
BUILDING DIVISION

05/01/2024

RECEIVED  
Per: joshua.nabua





BUILDER: **GREENPARK HOMES**  
SITE: **Trinigroup Developments Inc.**  
MODEL: **VILLA 2**  
CITY: **RICHMOND HILL**

Job Name: **VILLA 2**  
Level: **1ST FLOOR**  
Label: **B5 - i887**  
Type: **Beam**

**1 Ply Member**  
**1 3/4" x 11 7/8" (2.0E 3100)**  
**WestFraser LVL**

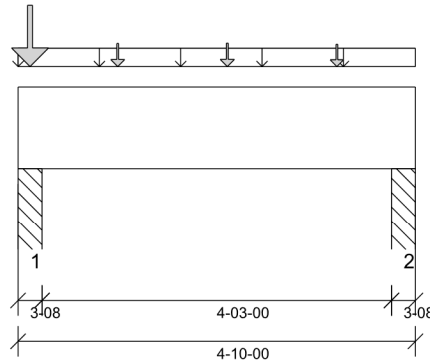
Status:  
**Design Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version 8.6.3.353.Update16.11

Report Version: 2021.03.26

09/27/2023 07:46



#### DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)

Design Methodology: LSD

Service Condition: Dry

LL Deflection Limit: L/360,

TL Deflection Limit: L/240,

#### Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 1'- 1 1/2"

#### Factored Resistance of Support Material:

- 615 psi Column @ 0'- 2 1/2"
- 615 psi Column @ 4'- 7 1/2"

#### ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	2'- 6 9/16"	1.25D + 1.5L	1.00	654 lb ft	17672 lb ft	Passed - 4%
Factored Neg. Moment:	0'- 2 1/2"	1.25D + 1.5L	1.00	95 lb ft	17672 lb ft	Passed - 1%
Factored Shear:	1'- 3 3/8"	1.25D + 1.5L	1.00	472 lb	6908 lb	Passed - 7%

#### SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	3'-08"	1.25D + 1.5L	1.00	2065 lb		6370 lb	3767 lb	Passed - 55%
2	3'-08"	1.25D + 1.5L	1.00	563 lb		6370 lb	3767 lb	Passed - 15%

#### SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	4'- 10"	Self Weight	Top	6 lb/ft	-	-	-
Uniform	0'	4'- 10"	User Load	Top	60 lb/ft	-	-	-
Point	1'- 2 9/16"	1'- 2 9/16"	J5(i916)	Back	59 lb	119 lb	-	-
Point	2'- 6 9/16"	2'- 6 9/16"	J5(i931)	Back	62 lb	124 lb	-	-
Point	3'- 10 9/16"	3'- 10 9/16"	J5(i898)	Back	53 lb	107 lb	-	-
Point	0'- 1 3/4"	0'- 1 3/4"	User Load	Top	350 lb	700 lb	-	-

#### UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'- 3 1/2"	PBO6(i55)	610 lb	901 lb	-	-
2	4'- 6 1/2"	4'- 10"	PBO5(i54)	233 lb	149 lb	-	-

#### DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- Beam Stability Factor used in the calculation for Allowable Max Pos Moment (KL) = 1.00
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.



STRUCTURAL COMPONENT ONLY  
DWG # TF23091218

CITY OF RICHMOND HILL  
BUILDING DIVISION

05/01/2024

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BUILDER: **GREENPARK HOMES**  
SITE: **Trinigroup Developments Inc.**  
MODEL: **VILLA 2**  
CITY: **RICHMOND HILL**

Job Name: **VILLA 2**  
Level: **1ST FLOOR**  
Label: **B6 - i957**  
Type: **Beam**

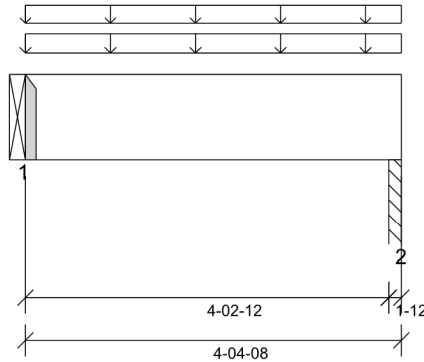
**1 Ply Member**  
**1 3/4" x 11 7/8" (2.0E 3100)**  
**WestFraser LVL**

Status:  
**Design Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version 8.6.3.353.Update16.11

Report Version: 2021.03.26 09/27/2023 07:46



#### DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)

Design Methodology: LSD

Service Condition: Dry

LL Deflection Limit: L/360,

TL Deflection Limit: L/240,

#### Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 4'- 4 1/2"

#### Factored Resistance of Support Material:

• 615 psi Beam @ 0'

• 615 psi Column @ 4'- 3 3/4"

#### ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	2'- 1 7/8"	1.25D + 1.5L	0.76	311 lb ft	13396 lb ft	Passed - 2%
Factored Shear:	0'- 11 7/8"	1.25D + 1.5L	0.76	156 lb	5236 lb	Passed - 3%

#### SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	1-08	1.25D + 1.5L	0.76	296 lb		2069 lb	-	Passed - 14%
2	1-12	1.25D + 1.5L	0.76	305 lb		2414 lb	1428 lb	Passed - 21%

#### CONNECTOR INFORMATION

ID	Part No.	Manufacturer	Nailing Requirements			Other Information or Requirement for Reinforcement Accessories
			Top	Face	Member	
1	HUS1.81/10		-	-	-	Connector manually specified by the user.
* Connectors: Refer to manufacturer's specifications, fasteners requirements and installation instruction. Where header fasteners are longer than the width of the supporting member, install backer block or clinch header nails.						

#### SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	4'- 4 1/2"	Self Weight	Top	6 lb/ft	-	-	-
Uniform	0'	4'- 4 1/2"	User Load	Top	60 lb/ft	-	-	-
Uniform	0'	4'- 4 1/2"	FC1 Floor Decking (Plan View Fill)	Top	12 lb/ft	24 lb/ft	-	-

#### UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'	B3(i886)	170 lb	56 lb	-	-
2	4'- 2 3/4"	4'- 4 1/2"	PBO6(i55)	175 lb	57 lb	-	-

#### DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- Beam Stability Factor used in the calculation for Allowable Max Pos Moment (KL) = 1.00
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.



STRUCTURAL COMPONENT ONLY  
DWG # TF23091219

CITY OF RICHMOND HILL  
BUILDING DIVISION

05/01/2024

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BUILDER: **GREENPARK HOMES**  
SITE: **Trinigroup Developments Inc.**  
MODEL: **VILLA 2**  
CITY: **RICHMOND HILL**

Job Name: **VILLA 2**  
Level: **1ST FLOOR**  
Label: **B7 - i928**  
Type: **Beam**

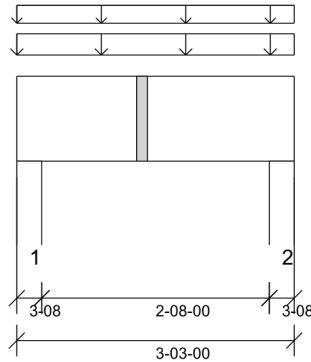
**2 Ply Member**  
**1 3/4" x 11 7/8" (2.0E 3100)**  
**WestFraser LVL**

Status:  
**Design Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version 8.6.3.353.Update16.11

Report Version: 2021.03.26 09/27/2023 07:46



#### DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)

Design Methodology: LSD

Service Condition: Dry

LL Deflection Limit: L/360,

TL Deflection Limit: L/240,

#### Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 1'- 6 7/8"

#### Factored Resistance of Support Material:

- 615 psi Wall @ 0'- 2 1/2"
- 615 psi Wall @ 3'- 1/2"

**PLY TO PLY CONNECTION:**  
4 ROWS OF 3.25" PNEUMATIC GUN NAILS (0.120"x3.25") @ 4" O/C

PLY TO PLY CONNECTION ASSUMES ANY SUPPORTED BEAM HANGERS ARE FASTENED TO THIS BEAM WITH MIN. 3.5" FASTENERS.

#### ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	1'- 7 1/2"	1.25D + 1.5L	0.66	193 lb ft	23478 lb ft	Passed - 1%
Factored Shear:	1'- 11 5/8"	1.25D + 1.5L	0.66	68 lb	9177 lb	Passed - 1%

#### SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	3-08	1.25D + 1.5L	0.66	319 lb		8463 lb	5006 lb	Passed - 6%
2	3-08	1.25D + 1.5L	0.66	319 lb		8463 lb	5006 lb	Passed - 6%

#### SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	3'- 3"	Self Weight	Top	12 lb/ft	-	-	-
Uniform	-0'	3'- 3"	E33(i338)	Top	100 lb/ft	-	-	-
Uniform	-0'	3'- 3"	FC1 Floor Decking (Plan View Fill)	Top	13 lb/ft	27 lb/ft	-	-

#### UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'- 3 1/2"	W25(i119)	203 lb	43 lb	-	-
2	2'- 11 1/2"	3'- 3"	W18(i19)	203 lb	43 lb	-	-

#### DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Lateral stability factor (KL) was based on user preference to use the width of all plies. (Consult with manufacturer for guideline pertaining to this design option.)
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- Beam Stability Factor used in the calculation for Allowable Max Pos Moment (KL) = 1.00
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

#### PLY TO PLY CONNECTION

- Member design assumed proper ply to ply connection by others. Fastener spacing along length of member must not exceed 4 times depth of member. Verify connection between plies according to code specification and follow the manufacturer's installation instruction. Loads assumed to be distributed equally to each ply.



STRUCTURAL COMPONENT ONLY  
DWG # TF23091220

CITY OF RICHMOND HILL  
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### Maximum Floor Spans – S2.1

#### Design Criteria

Spans:	Simple span
Loads:	Live load = 40 psf and dead load = 15 psf
Deflection limits:	L/480 under live load and L/240 under total load
Sheathing:	5/8 in. nailed-glued oriented strand board (OSB) sheathing

#### Maximum Floor Spans

Joist depth	Joist series	Bare On centre spacing				1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-1"	14'-3"	13'-10"	-	15'-7"	14'-9"	14'-3"	-
	NI-40x	16'-2"	15'-3"	14'-8"	-	16'-7"	15'-8"	15'-1"	-
	NI-60	16'-4"	15'-4"	14'-10"	-	16'-9"	15'-9"	15'-3"	-
	NI-80	17'-3"	16'-3"	15'-8"	-	17'-8"	16'-7"	16'-0"	-
11-7/8"	NI-20	17'-0"	16'-0"	15'-6"	-	17'-6"	16'-7"	16'-0"	-
	NI-40x	18'-2"	17'-1"	16'-6"	-	18'-9"	17'-6"	16'-11"	-
	NI-60	18'-5"	17'-3"	16'-8"	-	19'-0"	17'-8"	17'-1"	-
	NI-80	19'-9"	18'-3"	17'-7"	-	20'-4"	18'-10"	18'-0"	-
	NI-90	20'-2"	18'-8"	17'-10"	-	20'-9"	19'-2"	18'-4"	-
14"	NI-40x	20'-1"	18'-8"	17'-10"	-	20'-10"	19'-4"	18'-6"	-
	NI-60	20'-6"	18'-11"	18'-2"	-	21'-2"	19'-8"	18'-9"	-
	NI-80	21'-11"	20'-3"	19'-4"	-	22'-7"	20'-11"	20'-0"	-
	NI-90	22'-5"	20'-8"	19'-9"	-	23'-0"	21'-4"	20'-4"	-
16"	NI-60	22'-4"	20'-8"	19'-9"	-	23'-1"	21'-5"	20'-6"	-
	NI-80	23'-11"	22'-1"	21'-1"	-	24'-8"	22'-10"	21'-9"	-
	NI-90	24'-5"	22'-6"	21'-6"	-	25'-1"	23'-2"	22'-2"	-

Joist depth	Joist series	Mid-span blocking with 1x4 inch strap On centre spacing				Mid-span blocking and 1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	16'-8"	15'-3"	14'-5"	-	16'-8"	15'-3"	14'-5"	-
	NI-40x	17'-11"	17'-0"	16'-1"	-	18'-5"	17'-1"	16'-1"	-
	NI-60	18'-2"	17'-1"	16'-4"	-	18'-8"	17'-4"	16'-4"	-
	NI-80	19'-5"	18'-0"	17'-5"	-	19'-10"	18'-5"	17'-8"	-
11-7/8"	NI-20	19'-7"	18'-2"	17'-3"	-	19'-11"	18'-3"	17'-3"	-
	NI-40x	21'-1"	19'-7"	18'-8"	-	21'-8"	20'-2"	19'-2"	-
	NI-60	21'-4"	19'-9"	18'-11"	-	21'-11"	20'-5"	19'-6"	-
	NI-80	22'-9"	21'-1"	20'-2"	-	23'-3"	21'-8"	20'-8"	-
	NI-90	23'-3"	21'-6"	20'-6"	-	23'-9"	22'-0"	21'-0"	-
14"	NI-40x	23'-8"	21'-11"	20'-11"	-	24'-4"	22'-8"	21'-8"	-
	NI-60	24'-0"	22'-3"	21'-3"	-	24'-8"	22'-11"	21'-11"	-
	NI-80	25'-7"	23'-9"	22'-7"	-	26'-2"	24'-4"	23'-3"	-
	NI-90	26'-1"	24'-2"	23'-0"	-	26'-8"	24'-9"	23'-7"	-
16"	NI-60	26'-5"	24'-6"	23'-5"	-	27'-2"	25'-3"	24'-2"	-
	NI-80	28'-2"	26'-1"	24'-10"	-	28'-10"	26'-9"	25'-6"	-
	NI-90	28'-8"	26'-6"	25'-3"	-	29'-3"	27'-2"	25'-11"	-

#### Notes:

- The tabulated clear spans are based on CSA O86-14 and NBC 2015, and are applicable to residential floor construction meeting the above design criteria.
- For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Minimum bearing length shall be 1-3/4 inch for end bearings, and 3-1/2 inches for intermediate bearings.
- Bearing stiffeners are not required when I-joists are used in accordance with this table, except as required for hangers.
- Nordic I-joists are listed in CCMC Evaluation Report 13032-R and APA Product Report PR-L274C.

## Maximum Floor Spans – S4.1

### Design Criteria

Spans:	Simple span
Loads:	Live load = 40 psf and dead load = 15 psf
Deflection limits:	L/480 under live load and L/240 under total load
Sheathing:	3/4 in. nailed-glued oriented strand board (OSB) sheathing

### Maximum Floor Spans

Joist depth	Joist series	Bare On centre spacing				1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-11"	15'-0"	14'-6"	13'-5"	16'-5"	15'-5"	14'-6"	13'-5"
	NI-40x	17'-0"	16'-0"	15'-5"	14'-10"	17'-5"	16'-5"	15'-10"	15'-2"
	NI-60	17'-2"	16'-2"	15'-7"	14'-11"	17'-7"	16'-7"	16'-0"	15'-4"
	NI-80	18'-3"	17'-1"	16'-5"	15'-9"	18'-8"	17'-5"	16'-9"	16'-1"
11-7/8"	NI-20	17'-11"	16'-11"	16'-3"	15'-8"	18'-7"	17'-5"	16'-10"	16'-2"
	NI-40x	19'-4"	17'-11"	17'-3"	16'-7"	19'-11"	18'-6"	17'-9"	17'-0"
	NI-60	19'-7"	18'-2"	17'-6"	16'-9"	20'-2"	18'-9"	17'-11"	17'-2"
	NI-80	21'-1"	19'-6"	18'-6"	17'-7"	21'-7"	20'-0"	19'-0"	18'-0"
	NI-90	21'-6"	19'-10"	18'-11"	17'-11"	22'-0"	20'-4"	19'-5"	18'-4"
14"	NI-40x	21'-5"	19'-11"	18'-11"	18'-0"	22'-1"	20'-7"	19'-7"	18'-7"
	NI-60	21'-10"	20'-2"	19'-3"	18'-3"	22'-6"	20'-10"	19'-11"	18'-10"
	NI-80	23'-5"	21'-7"	20'-7"	19'-5"	24'-0"	22'-3"	21'-2"	20'-0"
	NI-90	23'-10"	22'-1"	21'-0"	19'-10"	24'-5"	22'-7"	21'-6"	20'-4"
16"	NI-60	23'-9"	22'-0"	21'-0"	19'-10"	24'-6"	22'-9"	21'-8"	20'-7"
	NI-80	25'-6"	23'-7"	22'-5"	21'-2"	26'-2"	24'-3"	23'-1"	21'-10"
	NI-90	26'-0"	24'-0"	22'-10"	21'-6"	26'-7"	24'-8"	23'-5"	22'-2"

Joist depth	Joist series	Mid-span blocking with 1x4 inch strap On centre spacing				Mid-span blocking and 1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	16'-10"	15'-5"	14'-6"	13'-5"	16'-10"	15'-5"	14'-6"	13'-5"
	NI-40x	18'-8"	17'-2"	16'-3"	15'-2"	18'-10"	17'-2"	16'-3"	15'-2"
	NI-60	18'-11"	17'-6"	16'-6"	15'-5"	19'-2"	17'-6"	16'-6"	15'-5"
	NI-80	20'-3"	18'-10"	17'-11"	16'-10"	20'-8"	19'-3"	18'-2"	16'-10"
11-7/8"	NI-20	20'-1"	18'-5"	17'-5"	16'-2"	20'-1"	18'-5"	17'-5"	16'-2"
	NI-40x	21'-10"	20'-4"	19'-4"	17'-8"	22'-5"	20'-6"	19'-4"	17'-8"
	NI-60	22'-1"	20'-7"	19'-8"	18'-4"	22'-8"	20'-10"	19'-8"	18'-4"
	NI-80	23'-8"	22'-0"	20'-11"	19'-10"	24'-1"	22'-6"	21'-6"	20'-0"
	NI-90	24'-1"	22'-5"	21'-4"	20'-2"	24'-7"	22'-11"	21'-10"	20'-7"
14"	NI-40x	24'-5"	22'-9"	21'-9"	19'-5"	25'-1"	23'-2"	21'-9"	19'-5"
	NI-60	24'-10"	23'-2"	22'-1"	20'-10"	25'-6"	23'-8"	22'-4"	20'-10"
	NI-80	26'-6"	24'-8"	23'-6"	22'-2"	27'-1"	25'-3"	24'-1"	22'-9"
	NI-90	27'-0"	25'-1"	23'-11"	22'-7"	27'-6"	25'-8"	24'-6"	23'-2"
16"	NI-60	27'-3"	25'-5"	24'-3"	22'-11"	28'-0"	26'-2"	24'-9"	23'-1"
	NI-80	29'-1"	27'-1"	25'-9"	24'-4"	29'-8"	27'-9"	26'-5"	25'-0"
	NI-90	29'-7"	27'-6"	26'-2"	24'-9"	30'-2"	28'-2"	26'-10"	25'-5"

### Notes:

- The tabulated clear spans are based on CSA O86-14 and NBC 2015, and are applicable to residential floor construction meeting the above design criteria.
- For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Minimum bearing length shall be 1-3/4 inch for end bearings, and 3-1/2 inches for intermediate bearings.
- Bearing stiffeners are not required when I-joists are used in accordance with this table, except as required for hangers.
- Nordic I-joists are listed in CCMC Evaluation Report 13032-R and APA Product Report PR-L274C.

### Maximum Floor Spans – S6.1

#### Design Criteria

Spans:	Simple span
Loads:	Live load = 40 psf and dead load = 15 psf
Deflection limits:	L/480 under live load and L/240 under total load
Sheathing:	5/8 in. nailed-glued Canadian softwood plywood

#### Maximum Floor Spans

Joist depth	Joist series	Bare On centre spacing				1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	14'-11"	14'-1"	13'-7"	-	15'-4"	14'-6"	14'-1"	-
	NI-40x	15'-11"	15'-0"	14'-6"	-	16'-4"	15'-5"	14'-11"	-
	NI-60	16'-1"	15'-2"	14'-8"	-	16'-6"	15'-7"	15'-1"	-
	NI-80	17'-1"	16'-1"	15'-6"	-	17'-5"	16'-5"	15'-10"	-
11-7/8"	NI-20	16'-9"	15'-10"	15'-4"	-	17'-4"	16'-4"	15'-10"	-
	NI-40x	17'-10"	16'-10"	16'-3"	-	18'-6"	17'-4"	16'-9"	-
	NI-60	18'-1"	17'-0"	16'-5"	-	18'-9"	17'-6"	16'-11"	-
	NI-80	19'-6"	18'-0"	17'-4"	-	20'-1"	18'-7"	17'-9"	-
	NI-90	19'-11"	18'-4"	17'-8"	-	20'-5"	18'-11"	18'-1"	-
14"	NI-40x	19'-10"	18'-4"	17'-8"	-	20'-6"	19'-1"	18'-3"	-
	NI-60	20'-2"	18'-8"	17'-11"	-	20'-10"	19'-4"	18'-6"	-
	NI-80	21'-8"	20'-0"	19'-1"	-	22'-4"	20'-8"	19'-9"	-
	NI-90	22'-1"	20'-5"	19'-6"	-	22'-9"	21'-0"	20'-1"	-
16"	NI-60	22'-0"	20'-4"	19'-6"	-	22'-9"	21'-1"	20'-2"	-
	NI-80	23'-7"	21'-10"	20'-10"	-	24'-4"	22'-6"	21'-6"	-
	NI-90	24'-1"	22'-2"	21'-2"	-	24'-9"	22'-11"	21'-10"	-

Joist depth	Joist series	Mid-span blocking with 1x4 inch strap On centre spacing				Mid-span blocking and 1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	16'-6"	15'-1"	14'-3"	-	16'-6"	15'-1"	14'-3"	-
	NI-40x	17'-9"	16'-10"	15'-11"	-	18'-2"	16'-11"	15'-11"	-
	NI-60	17'-11"	16'-11"	16'-2"	-	18'-5"	17'-2"	16'-2"	-
	NI-80	19'-3"	17'-10"	17'-3"	-	19'-8"	18'-3"	17'-7"	-
11-7/8"	NI-20	19'-4"	18'-0"	17'-1"	-	19'-9"	18'-1"	17'-1"	-
	NI-40x	20'-10"	19'-4"	18'-6"	-	21'-5"	19'-11"	19'-0"	-
	NI-60	21'-1"	19'-7"	18'-8"	-	21'-8"	20'-2"	19'-3"	-
	NI-80	22'-6"	20'-10"	19'-11"	-	23'-1"	21'-5"	20'-5"	-
	NI-90	23'-0"	21'-3"	20'-4"	-	23'-6"	21'-10"	20'-10"	-
14"	NI-40x	23'-5"	21'-8"	20'-9"	-	24'-0"	22'-5"	21'-5"	-
	NI-60	23'-9"	22'-0"	21'-0"	-	24'-5"	22'-8"	21'-8"	-
	NI-80	25'-4"	23'-6"	22'-5"	-	25'-11"	24'-1"	23'-0"	-
	NI-90	25'-10"	23'-11"	22'-9"	-	26'-5"	24'-6"	23'-4"	-
16"	NI-60	26'-2"	24'-3"	23'-2"	-	26'-11"	25'-0"	23'-11"	-
	NI-80	27'-11"	25'-10"	24'-7"	-	28'-7"	26'-6"	25'-3"	-
	NI-90	28'-5"	26'-3"	25'-0"	-	29'-0"	26'-11"	25'-8"	-

#### Notes:

- The tabulated clear spans are based on CSA O86-14 and NBC 2015, and are applicable to residential floor construction meeting the above design criteria.
- For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Minimum bearing length shall be 1-3/4 inch for end bearings, and 3-1/2 inches for intermediate bearings.
- Bearing stiffeners are not required when I-joists are used in accordance with this table, except as required for hangers.
- Nordic I-joists are listed in CCMC Evaluation Report 13032-R and APA Product Report PR-L274C.

## Maximum Floor Spans – S7.1

### Design Criteria

Spans:	Simple span
Loads:	Live load = 40 psf and dead load = 15 psf
Deflection limits:	L/480 under live load and L/240 under total load
Sheathing:	3/4 in. nailed-glued Canadian softwood plywood

### Maximum Floor Spans

Joist depth	Joist series	Bare On centre spacing				1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-10"	15'-0"	14'-5"	13'-5"	16'-4"	15'-5"	14'-6"	13'-5"
	NI-40x	16'-11"	15'-11"	15'-4"	14'-9"	17'-4"	16'-4"	15'-9"	15'-1"
	NI-60	17'-1"	16'-1"	15'-6"	14'-10"	17'-6"	16'-6"	15'-11"	15'-3"
	NI-80	18'-1"	17'-0"	16'-4"	15'-8"	18'-7"	17'-4"	16'-8"	16'-0"
11-7/8"	NI-20	17'-10"	16'-10"	16'-2"	15'-7"	18'-5"	17'-4"	16'-9"	16'-1"
	NI-40x	19'-3"	17'-10"	17'-2"	16'-6"	19'-10"	18'-5"	17'-8"	16'-11"
	NI-60	19'-6"	18'-1"	17'-4"	16'-8"	20'-1"	18'-8"	17'-10"	17'-1"
	NI-80	20'-11"	19'-4"	18'-5"	17'-7"	21'-5"	19'-10"	18'-11"	17'-11"
	NI-90	21'-4"	19'-9"	18'-9"	17'-10"	21'-10"	20'-3"	19'-3"	18'-3"
14"	NI-40x	21'-4"	19'-9"	18'-10"	17'-11"	22'-0"	20'-5"	19'-6"	18'-6"
	NI-60	21'-8"	20'-1"	19'-2"	18'-2"	22'-4"	20'-9"	19'-9"	18'-9"
	NI-80	23'-3"	21'-6"	20'-5"	19'-4"	23'-10"	22'-1"	21'-0"	19'-11"
	NI-90	23'-9"	21'-11"	20'-10"	19'-8"	24'-3"	22'-6"	21'-5"	20'-3"
16"	NI-60	23'-7"	21'-10"	20'-10"	19'-9"	24'-4"	22'-7"	21'-7"	20'-5"
	NI-80	25'-4"	23'-5"	22'-3"	21'-1"	26'-0"	24'-1"	22'-11"	21'-8"
	NI-90	25'-10"	23'-10"	22'-8"	21'-5"	26'-5"	24'-6"	23'-4"	22'-0"

Joist depth	Joist series	Mid-span blocking with 1x4 inch strap On centre spacing				Mid-span blocking and 1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	16'-10"	15'-5"	14'-6"	13'-5"	16'-10"	15'-5"	14'-6"	13'-5"
	NI-40x	18'-7"	17'-2"	16'-3"	15'-2"	18'-10"	17'-2"	16'-3"	15'-2"
	NI-60	18'-10"	17'-6"	16'-6"	15'-5"	19'-1"	17'-6"	16'-6"	15'-5"
	NI-80	20'-2"	18'-9"	17'-11"	16'-10"	20'-7"	19'-2"	18'-2"	16'-10"
11-7/8"	NI-20	20'-1"	18'-5"	17'-5"	16'-2"	20'-1"	18'-5"	17'-5"	16'-2"
	NI-40x	21'-9"	20'-3"	19'-4"	17'-8"	22'-4"	20'-5"	19'-4"	17'-8"
	NI-60	22'-0"	20'-6"	19'-7"	18'-4"	22'-7"	20'-10"	19'-8"	18'-4"
	NI-80	23'-6"	21'-10"	20'-10"	19'-9"	24'-0"	22'-5"	21'-4"	20'-0"
	NI-90	24'-0"	22'-4"	21'-3"	20'-1"	24'-6"	22'-10"	21'-9"	20'-7"
14"	NI-40x	24'-4"	22'-8"	21'-8"	19'-5"	25'-0"	23'-2"	21'-9"	19'-5"
	NI-60	24'-9"	23'-0"	22'-0"	20'-9"	25'-5"	23'-8"	22'-4"	20'-10"
	NI-80	26'-5"	24'-6"	23'-4"	22'-1"	27'-0"	25'-2"	24'-0"	22'-8"
	NI-90	26'-11"	25'-0"	23'-10"	22'-6"	27'-5"	25'-7"	24'-5"	23'-1"
16"	NI-60	27'-2"	25'-4"	24'-2"	22'-10"	27'-11"	26'-1"	24'-9"	23'-1"
	NI-80	29'-0"	26'-11"	25'-8"	24'-3"	29'-7"	27'-7"	26'-4"	24'-11"
	NI-90	29'-6"	27'-5"	26'-1"	24'-8"	30'-1"	28'-1"	26'-9"	25'-4"

### Notes:

- The tabulated clear spans are based on CSA O86-14 and NBC 2015, and are applicable to residential floor construction meeting the above design criteria.
- For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Minimum bearing length shall be 1-3/4 inch for end bearings, and 3-1/2 inches for intermediate bearings.
- Bearing stiffeners are not required when I-joists are used in accordance with this table, except as required for hangers.
- Nordic I-joists are listed in CCMC Evaluation Report 13032-R and APA Product Report PR-L274C.



### Maximum Floor Spans – M2.1

#### Design Criteria

Spans:	Simple span
Loads:	Live load = 40 psf and dead load = 20 psf
Deflection limits:	L/480 under live load and L/240 under total load
Sheathing:	5/8 in. nailed-glued oriented strand board (OSB) sheathing

#### Maximum Floor Spans

Joist depth	Joist series	Bare On centre spacing				1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-1"	14'-3"	13'-10"	-	15'-7"	14'-9"	14'-3"	-
	NI-40x	16'-2"	15'-3"	14'-8"	-	16'-7"	15'-8"	15'-1"	-
	NI-60	16'-4"	15'-4"	14'-10"	-	16'-9"	15'-9"	15'-3"	-
	NI-80	17'-3"	16'-3"	15'-8"	-	17'-8"	16'-7"	16'-0"	-
11-7/8"	NI-20	17'-0"	16'-0"	15'-6"	-	17'-6"	16'-7"	16'-0"	-
	NI-40x	18'-2"	17'-1"	16'-6"	-	18'-9"	17'-6"	16'-11"	-
	NI-60	18'-5"	17'-3"	16'-8"	-	19'-0"	17'-8"	17'-1"	-
	NI-80	19'-9"	18'-3"	17'-7"	-	20'-4"	18'-10"	18'-0"	-
	NI-90	20'-2"	18'-8"	17'-10"	-	20'-9"	19'-2"	18'-4"	-
14"	NI-40x	20'-1"	18'-8"	17'-10"	-	20'-10"	19'-4"	18'-6"	-
	NI-60	20'-6"	18'-11"	18'-2"	-	21'-2"	19'-8"	18'-9"	-
	NI-80	21'-11"	20'-3"	19'-4"	-	22'-7"	20'-11"	20'-0"	-
	NI-90	22'-5"	20'-8"	19'-9"	-	23'-0"	21'-4"	20'-4"	-
16"	NI-60	22'-4"	20'-8"	19'-9"	-	23'-1"	21'-5"	20'-6"	-
	NI-80	23'-11"	22'-1"	21'-1"	-	24'-8"	22'-10"	21'-9"	-
	NI-90	24'-5"	22'-6"	21'-6"	-	25'-1"	23'-2"	22'-2"	-

Joist depth	Joist series	Mid-span blocking with 1x4 inch strap On centre spacing				Mid-span blocking and 1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	16'-8"	15'-3"	14'-5"	-	16'-8"	15'-3"	14'-5"	-
	NI-40x	17'-11"	17'-0"	16'-1"	-	18'-5"	17'-1"	16'-1"	-
	NI-60	18'-2"	17'-1"	16'-4"	-	18'-8"	17'-4"	16'-4"	-
	NI-80	19'-5"	18'-0"	17'-5"	-	19'-10"	18'-5"	17'-8"	-
11-7/8"	NI-20	19'-7"	18'-2"	17'-3"	-	19'-11"	18'-3"	17'-3"	-
	NI-40x	21'-1"	19'-7"	18'-8"	-	21'-8"	20'-2"	19'-0"	-
	NI-60	21'-4"	19'-9"	18'-11"	-	21'-11"	20'-5"	19'-6"	-
	NI-80	22'-9"	21'-1"	20'-2"	-	23'-3"	21'-8"	20'-8"	-
	NI-90	23'-3"	21'-6"	20'-6"	-	23'-9"	22'-0"	21'-0"	-
14"	NI-40x	23'-8"	21'-11"	20'-11"	-	24'-4"	22'-8"	20'-11"	-
	NI-60	24'-0"	22'-3"	21'-3"	-	24'-8"	22'-11"	21'-11"	-
	NI-80	25'-7"	23'-9"	22'-7"	-	26'-2"	24'-4"	23'-3"	-
	NI-90	26'-1"	24'-2"	23'-0"	-	26'-8"	24'-9"	23'-7"	-
16"	NI-60	26'-5"	24'-6"	23'-5"	-	27'-2"	25'-3"	24'-2"	-
	NI-80	28'-2"	26'-1"	24'-10"	-	28'-10"	26'-9"	25'-6"	-
	NI-90	28'-8"	26'-6"	25'-3"	-	29'-3"	27'-2"	25'-11"	-

#### Notes:

- The tabulated clear spans are based on CSA O86-14 and NBC 2015, and are applicable to residential floor construction meeting the above design criteria.
- For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Minimum bearing length shall be 1-3/4 inch for end bearings, and 3-1/2 inches for intermediate bearings.
- Bearing stiffeners are not required when I-joists are used in accordance with this table, except as required for hangers.
- Nordic I-joists are listed in CCMC Evaluation Report 13032-R and APA Product Report PR-L274C.

## Maximum Floor Spans – M4.1

### Design Criteria

Spans:	Simple span
Loads:	Live load = 40 psf and dead load = 20 psf
Deflection limits:	L/480 under live load and L/240 under total load
Sheathing:	3/4 in. nailed-glued oriented strand board (OSB) sheathing

### Maximum Floor Spans

Joist depth	Joist series	Bare On centre spacing				1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-11"	15'-0"	14'-6"	13'-5"	16'-5"	15'-5"	14'-6"	13'-5"
	NI-40x	17'-0"	16'-0"	15'-5"	14'-10"	17'-5"	16'-5"	15'-10"	14'-11"
	NI-60	17'-2"	16'-2"	15'-7"	14'-11"	17'-7"	16'-7"	16'-0"	15'-4"
	NI-80	18'-3"	17'-1"	16'-5"	15'-9"	18'-8"	17'-5"	16'-9"	16'-1"
11-7/8"	NI-20	17'-11"	16'-11"	16'-3"	15'-8"	18'-7"	17'-5"	16'-10"	16'-1"
	NI-40x	19'-4"	17'-11"	17'-3"	16'-7"	19'-11"	18'-6"	17'-9"	17'-0"
	NI-60	19'-7"	18'-2"	17'-6"	16'-9"	20'-2"	18'-9"	17'-11"	17'-2"
	NI-80	21'-1"	19'-6"	18'-6"	17'-7"	21'-7"	20'-0"	19'-0"	18'-0"
	NI-90	21'-6"	19'-10"	18'-11"	17'-11"	22'-0"	20'-4"	19'-5"	18'-4"
14"	NI-40x	21'-5"	19'-11"	18'-11"	18'-0"	22'-1"	20'-7"	19'-7"	18'-7"
	NI-60	21'-10"	20'-2"	19'-3"	18'-3"	22'-6"	20'-10"	19'-11"	18'-10"
	NI-80	23'-5"	21'-7"	20'-7"	19'-5"	24'-0"	22'-3"	21'-2"	20'-0"
	NI-90	23'-10"	22'-1"	21'-0"	19'-10"	24'-5"	22'-7"	21'-6"	20'-4"
16"	NI-60	23'-9"	22'-0"	21'-0"	19'-10"	24'-6"	22'-9"	21'-8"	20'-7"
	NI-80	25'-6"	23'-7"	22'-5"	21'-2"	26'-2"	24'-3"	23'-1"	21'-10"
	NI-90	26'-0"	24'-0"	22'-10"	21'-6"	26'-7"	24'-8"	23'-5"	22'-2"

Joist depth	Joist series	Mid-span blocking with 1x4 inch strap On centre spacing				Mid-span blocking and 1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	16'-10"	15'-5"	14'-6"	13'-5"	16'-10"	15'-5"	14'-6"	13'-5"
	NI-40x	18'-8"	17'-2"	16'-3"	14'-11"	18'-10"	17'-2"	16'-3"	14'-11"
	NI-60	18'-11"	17'-6"	16'-6"	15'-5"	19'-2"	17'-6"	16'-6"	15'-5"
	NI-80	20'-3"	18'-10"	17'-11"	16'-10"	20'-8"	19'-3"	18'-2"	16'-10"
11-7/8"	NI-20	20'-1"	18'-5"	17'-5"	16'-1"	20'-1"	18'-5"	17'-5"	16'-1"
	NI-40x	21'-10"	20'-4"	19'-0"	17'-0"	22'-5"	20'-6"	19'-0"	17'-0"
	NI-60	22'-1"	20'-7"	19'-8"	18'-4"	22'-8"	20'-10"	19'-8"	18'-4"
	NI-80	23'-8"	22'-0"	20'-11"	19'-10"	24'-1"	22'-6"	21'-6"	20'-0"
	NI-90	24'-1"	22'-5"	21'-4"	20'-2"	24'-7"	22'-11"	21'-10"	20'-7"
14"	NI-40x	24'-5"	22'-9"	20'-11"	18'-8"	25'-1"	22'-11"	20'-11"	18'-8"
	NI-60	24'-10"	23'-2"	22'-1"	20'-10"	25'-6"	23'-8"	22'-4"	20'-10"
	NI-80	26'-6"	24'-8"	23'-6"	22'-2"	27'-1"	25'-3"	24'-1"	22'-9"
	NI-90	27'-0"	25'-1"	23'-11"	22'-7"	27'-6"	25'-8"	24'-6"	23'-2"
16"	NI-60	27'-3"	25'-5"	24'-3"	22'-11"	28'-0"	26'-2"	24'-9"	23'-1"
	NI-80	29'-1"	27'-1"	25'-9"	24'-4"	29'-8"	27'-9"	26'-5"	25'-0"
	NI-90	29'-7"	27'-6"	26'-2"	24'-9"	30'-2"	28'-2"	26'-10"	25'-5"

### Notes:

- The tabulated clear spans are based on CSA O86-14 and NBC 2015, and are applicable to residential floor construction meeting the above design criteria.
- For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Minimum bearing length shall be 1-3/4 inch for end bearings, and 3-1/2 inches for intermediate bearings.
- Bearing stiffeners are not required when I-joists are used in accordance with this table, except as required for hangers.
- Nordic I-joists are listed in CCMC Evaluation Report 13032-R and APA Product Report PR-L274C.

## Maximum Floor Spans – M6.1

### Design Criteria

Spans:	Simple span
Loads:	Live load = 40 psf and dead load = 20 psf
Deflection limits:	L/480 under live load and L/240 under total load
Sheathing:	5/8 in. nailed-glued Canadian softwood plywood

### Maximum Floor Spans

Joist depth	Joist series	Bare On centre spacing				1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	14'-11"	14'-1"	13'-7"	-	15'-4"	14'-6"	14'-1"	-
	NI-40x	15'-11"	15'-0"	14'-6"	-	16'-4"	15'-5"	14'-11"	-
	NI-60	16'-1"	15'-2"	14'-8"	-	16'-6"	15'-7"	15'-1"	-
	NI-80	17'-1"	16'-1"	15'-6"	-	17'-5"	16'-5"	15'-10"	-
11-7/8"	NI-20	16'-9"	15'-10"	15'-4"	-	17'-4"	16'-4"	15'-10"	-
	NI-40x	17'-10"	16'-10"	16'-3"	-	18'-6"	17'-4"	16'-9"	-
	NI-60	18'-1"	17'-0"	16'-5"	-	18'-9"	17'-6"	16'-11"	-
	NI-80	19'-6"	18'-0"	17'-4"	-	20'-1"	18'-7"	17'-9"	-
	NI-90	19'-11"	18'-4"	17'-8"	-	20'-5"	18'-11"	18'-1"	-
14"	NI-40x	19'-10"	18'-4"	17'-8"	-	20'-6"	19'-1"	18'-3"	-
	NI-60	20'-2"	18'-8"	17'-11"	-	20'-10"	19'-4"	18'-6"	-
	NI-80	21'-8"	20'-0"	19'-1"	-	22'-4"	20'-8"	19'-9"	-
	NI-90	22'-1"	20'-5"	19'-6"	-	22'-9"	21'-0"	20'-1"	-
16"	NI-60	22'-0"	20'-4"	19'-6"	-	22'-9"	21'-1"	20'-2"	-
	NI-80	23'-7"	21'-10"	20'-10"	-	24'-4"	22'-6"	21'-6"	-
	NI-90	24'-1"	22'-2"	21'-2"	-	24'-9"	22'-11"	21'-10"	-

Joist depth	Joist series	Mid-span blocking with 1x4 inch strap On centre spacing				Mid-span blocking and 1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	16'-6"	15'-1"	14'-3"	-	16'-6"	15'-1"	14'-3"	-
	NI-40x	17'-9"	16'-10"	15'-11"	-	18'-2"	16'-11"	15'-11"	-
	NI-60	17'-11"	16'-11"	16'-2"	-	18'-5"	17'-2"	16'-2"	-
	NI-80	19'-3"	17'-10"	17'-3"	-	19'-8"	18'-3"	17'-7"	-
11-7/8"	NI-20	19'-4"	18'-0"	17'-1"	-	19'-9"	18'-1"	17'-1"	-
	NI-40x	20'-10"	19'-4"	18'-6"	-	21'-5"	19'-11"	19'-0"	-
	NI-60	21'-1"	19'-7"	18'-8"	-	21'-8"	20'-2"	19'-3"	-
	NI-80	22'-6"	20'-10"	19'-11"	-	23'-1"	21'-5"	20'-5"	-
	NI-90	23'-0"	21'-3"	20'-4"	-	23'-6"	21'-10"	20'-10"	-
14"	NI-40x	23'-5"	21'-8"	20'-9"	-	24'-0"	22'-5"	20'-11"	-
	NI-60	23'-9"	22'-0"	21'-0"	-	24'-5"	22'-8"	21'-8"	-
	NI-80	25'-4"	23'-6"	22'-5"	-	25'-11"	24'-1"	23'-0"	-
	NI-90	25'-10"	23'-11"	22'-9"	-	26'-5"	24'-6"	23'-4"	-
16"	NI-60	26'-2"	24'-3"	23'-2"	-	26'-11"	25'-0"	23'-11"	-
	NI-80	27'-11"	25'-10"	24'-7"	-	28'-7"	26'-6"	25'-3"	-
	NI-90	28'-5"	26'-3"	25'-0"	-	29'-0"	26'-11"	25'-8"	-

### Notes:

- The tabulated clear spans are based on CSA O86-14 and NBC 2015, and are applicable to residential floor construction meeting the above design criteria.
- For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Minimum bearing length shall be 1-3/4 inch for end bearings, and 3-1/2 inches for intermediate bearings.
- Bearing stiffeners are not required when I-joists are used in accordance with this table, except as required for hangers.
- Nordic I-joists are listed in CCMC Evaluation Report 13032-R and APA Product Report PR-L274C.

## Maximum Floor Spans – M7.1

### Design Criteria

Spans:	Simple span
Loads:	Live load = 40 psf and dead load = 20 psf
Deflection limits:	L/480 under live load and L/240 under total load
Sheathing:	3/4 in. nailed-glued Canadian softwood plywood

### Maximum Floor Spans

Joist depth	Joist series	Bare On centre spacing				1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-10"	15'-0"	14'-5"	13'-5"	16'-4"	15'-5"	14'-6"	13'-5"
	NI-40x	16'-11"	15'-11"	15'-4"	14'-9"	17'-4"	16'-4"	15'-9"	14'-11"
	NI-60	17'-1"	16'-1"	15'-6"	14'-10"	17'-6"	16'-6"	15'-11"	15'-3"
	NI-80	18'-1"	17'-0"	16'-4"	15'-8"	18'-7"	17'-4"	16'-8"	16'-0"
11-7/8"	NI-20	17'-10"	16'-10"	16'-2"	15'-7"	18'-5"	17'-4"	16'-9"	16'-1"
	NI-40x	19'-3"	17'-10"	17'-2"	16'-6"	19'-10"	18'-5"	17'-8"	16'-11"
	NI-60	19'-6"	18'-1"	17'-4"	16'-8"	20'-1"	18'-8"	17'-10"	17'-1"
	NI-80	20'-11"	19'-4"	18'-5"	17'-7"	21'-5"	19'-10"	18'-11"	17'-11"
	NI-90	21'-4"	19'-9"	18'-9"	17'-10"	21'-10"	20'-3"	19'-3"	18'-3"
14"	NI-40x	21'-4"	19'-9"	18'-10"	17'-11"	22'-0"	20'-5"	19'-6"	18'-6"
	NI-60	21'-8"	20'-1"	19'-2"	18'-2"	22'-4"	20'-9"	19'-9"	18'-9"
	NI-80	23'-3"	21'-6"	20'-5"	19'-4"	23'-10"	22'-1"	21'-0"	19'-11"
	NI-90	23'-9"	21'-11"	20'-10"	19'-8"	24'-3"	22'-6"	21'-5"	20'-3"
16"	NI-60	23'-7"	21'-10"	20'-10"	19'-9"	24'-4"	22'-7"	21'-7"	20'-5"
	NI-80	25'-4"	23'-5"	22'-3"	21'-1"	26'-0"	24'-1"	22'-11"	21'-8"
	NI-90	25'-10"	23'-10"	22'-8"	21'-5"	26'-5"	24'-6"	23'-4"	22'-0"

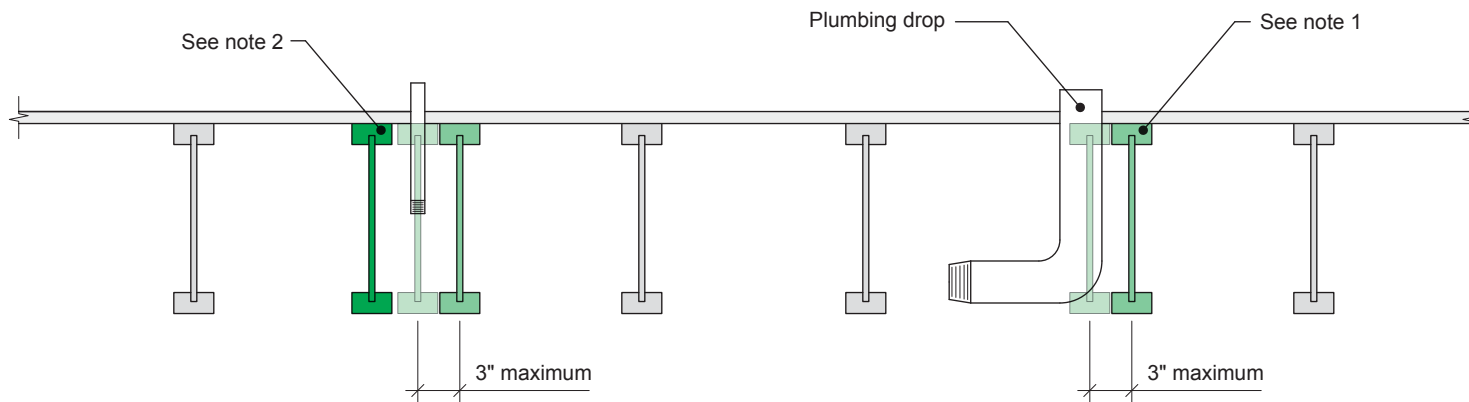
Joist depth	Joist series	Mid-span blocking with 1x4 inch strap On centre spacing				Mid-span blocking and 1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	16'-10"	15'-5"	14'-6"	13'-5"	16'-10"	15'-5"	14'-6"	13'-5"
	NI-40x	18'-7"	17'-2"	16'-3"	14'-11"	18'-10"	17'-2"	16'-3"	14'-11"
	NI-60	18'-10"	17'-6"	16'-6"	15'-5"	19'-1"	17'-6"	16'-6"	15'-5"
	NI-80	20'-2"	18'-9"	17'-11"	16'-10"	20'-7"	19'-2"	18'-2"	16'-10"
11-7/8"	NI-20	20'-1"	18'-5"	17'-5"	16'-1"	20'-1"	18'-5"	17'-5"	16'-1"
	NI-40x	21'-9"	20'-3"	19'-0"	17'-0"	22'-4"	20'-5"	19'-0"	17'-0"
	NI-60	22'-0"	20'-6"	19'-7"	18'-4"	22'-7"	20'-10"	19'-8"	18'-4"
	NI-80	23'-6"	21'-10"	20'-10"	19'-9"	24'-0"	22'-5"	21'-4"	20'-0"
	NI-90	24'-0"	22'-4"	21'-3"	20'-1"	24'-6"	22'-10"	21'-9"	20'-7"
14"	NI-40x	24'-4"	22'-8"	20'-11"	18'-8"	25'-0"	22'-11"	20'-11"	18'-8"
	NI-60	24'-9"	23'-0"	22'-0"	20'-9"	25'-5"	23'-8"	22'-4"	20'-10"
	NI-80	26'-5"	24'-6"	23'-4"	22'-1"	27'-0"	25'-2"	24'-0"	22'-8"
	NI-90	26'-11"	25'-0"	23'-10"	22'-6"	27'-5"	25'-7"	24'-5"	23'-1"
16"	NI-60	27'-2"	25'-4"	24'-2"	22'-10"	27'-11"	26'-1"	24'-9"	23'-1"
	NI-80	29'-0"	26'-11"	25'-8"	24'-3"	29'-7"	27'-7"	26'-4"	24'-11"
	NI-90	29'-6"	27'-5"	26'-1"	24'-8"	30'-1"	28'-1"	26'-9"	25'-4"

### Notes:

1. The tabulated clear spans are based on CSA O86-14 and NBC 2015, and are applicable to residential floor construction meeting the above design criteria.
2. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
3. Minimum bearing length shall be 1-3/4 inch for end bearings, and 3-1/2 inches for intermediate bearings.
4. Bearing stiffeners are not required when I-joists are used in accordance with this table, except as required for hangers.
5. Nordic I-joists are listed in CCMC Evaluation Report 13032-R and APA Product Report PR-L274C.



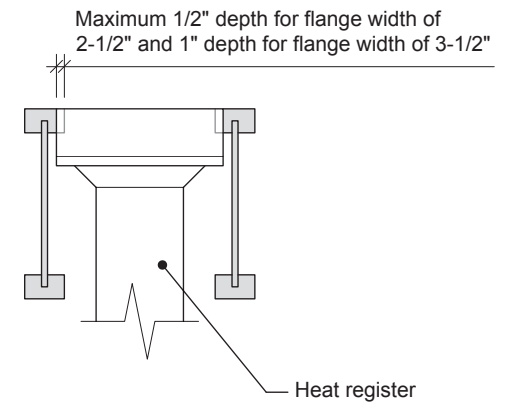
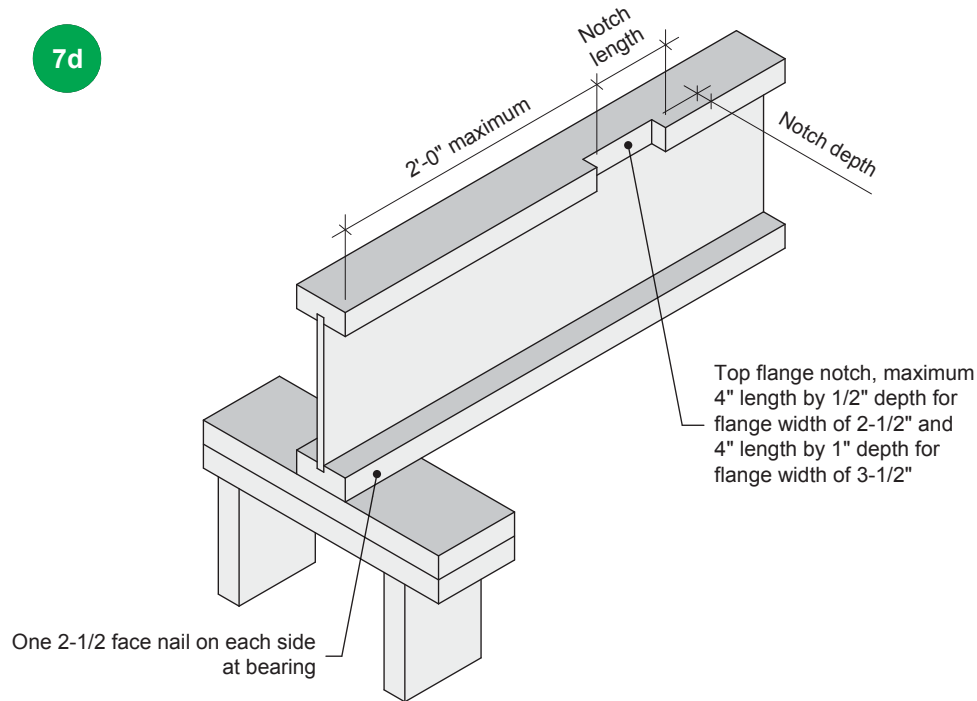
7c

**Notes:**

1. To prevent interference with plumbing, a joist may be shifted up to 3 inches if the edge of the floor panel is supported and the span rating is not exceeded.
2. In all other cases, an additional joist is required.

All nails shown in the details are assumed to be common nails unless otherwise noted. Nails shall have a diameter not less than 0.128 inch for 2-1/2-inch nails, or 0.144 inch for 3-inch nails. Individual components not shown to scale for clarity.

7d



**Notes:**

1. Blocking required at bearing for lateral support, not shown for clarity.
2. The maximum dimensions for a notch on the side of the top flange are 4-inch length by 1/2-inch depth for flange width of 2-1/2 inches, and 4-inch length by 1-inch depth for flange width of 3-1/2 inches.
3. This detail applies to simple-span joists and multiple-span joists where the notch is located at the end half-span.
4. For other applications, contact Nordic Structures.

All nails shown in the details are assumed to be common nails unless otherwise noted. Nails shall have a diameter not less than 0.128 inch for 2-1/2-inch nails, or 0.144 inch for 3-inch nails. Individual components not shown to scale for clarity.