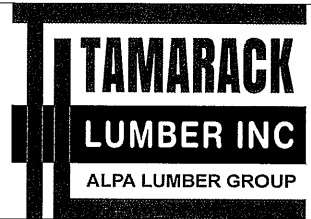


Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	32
J1DJ	16-00-00	9 1/2" NI-40x	2	8
J2	14-00-00	9 1/2" NI-40x	1	4
J2DJ	14-00-00	9 1/2" NI-40x	2	4
J3	12-00-00	9 1/2" NI-40x	1	2
J4	10-00-00	9 1/2" NI-40x	1	6
J5	8-00-00	9 1/2" NI-40x	1	7
J6	6-00-00	9 1/2" NI-40x	1	1
J7	4-00-00	9 1/2" NI-40x	1	3
J8	2-00-00	9 1/2" NI-40x	1	2
B5	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B1	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B4	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B3	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B2	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B6	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2

Connector Summary		
Qty	Manuf	Product
6	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
2	H4	HGUS410
1	H4	HGUS410



FROM PLAN DATED: AUG 2020

BUILDER: ROYALPINE HOMES

SITE: CENTREFIELD

MODEL: 38-9 Bloomington

ELEVATION: A, B, C

LOT:

CITY: RICHMOND HILL

SALESMAN: WILL GARCIA

DESIGNER: LBV

REVISION: AJ

**NOTES:**  
REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.  
**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.F 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 7, TABLES 1 & 2. **CERAMIC TILE** APPLICATION AS PER O.B.C 9.30.6.

**LOADING:**  
DESIGN LOADS: L/480.000  
LIVE LOAD: 40.0 lb/ft²  
DEAD LOAD: 15.0 lb/ft²  
TILE LOAD: 20.0 lb/ft²

**SUBFLOOR:** 3/4" GLUED AND NAILED

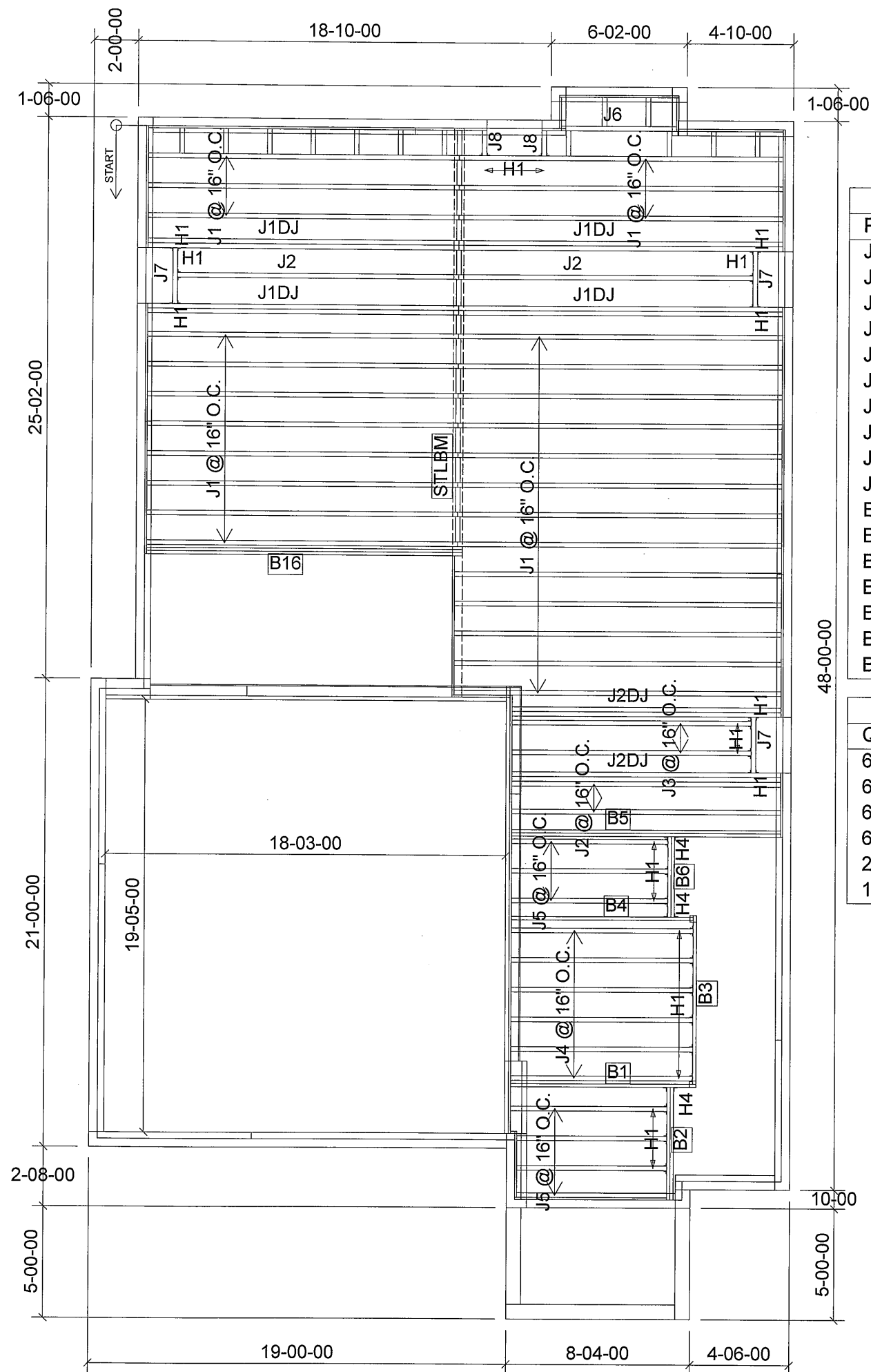
CITY OF RICHMOND HILL  
BUILDING DIVISION

08/10/2021

RECEIVED  
Per: danielle.devitt

DATE: 2021-06-04

1st FLOOR



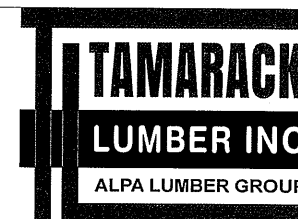
Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	27
J1DJ	16-00-00	9 1/2" NI-40x	2	8
J2	14-00-00	9 1/2" NI-40x	1	4
J2DJ	14-00-00	9 1/2" NI-40x	2	4
J3	12-00-00	9 1/2" NI-40x	1	2
J4	10-00-00	9 1/2" NI-40x	1	6
J5	8-00-00	9 1/2" NI-40x	1	7
J6	6-00-00	9 1/2" NI-40x	1	1
J7	4-00-00	9 1/2" NI-40x	1	3
J8	2-00-00	9 1/2" NI-40x	1	2
B16	16-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B5	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B1	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B4	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B3	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B2	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B6	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2

Connector Summary		
Qty	Manuf	Product
6	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
2	H4	HGUS410
1	H4	HGUS410

DATE: 2021-06-04

1st FLOOR

SUNKEN OPTION



FROM PLAN DATED: AUG 2020

BUILDER: ROYALPINE HOMES

SITE: CENTREFIELD

MODEL: 38-9 Bloomington

ELEVATION: A, B, C

LOT:

CITY: RICHMOND HILL

SALESMAN: WILL GARCIA

DESIGNER: LBV

REVISION: AJ

NOTES:

REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.

**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.F 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 7 TABLES 1 & 2. **CERAMIC TILE** APPLICATION AS PER O.B.C 9.30.6.

LOADING:

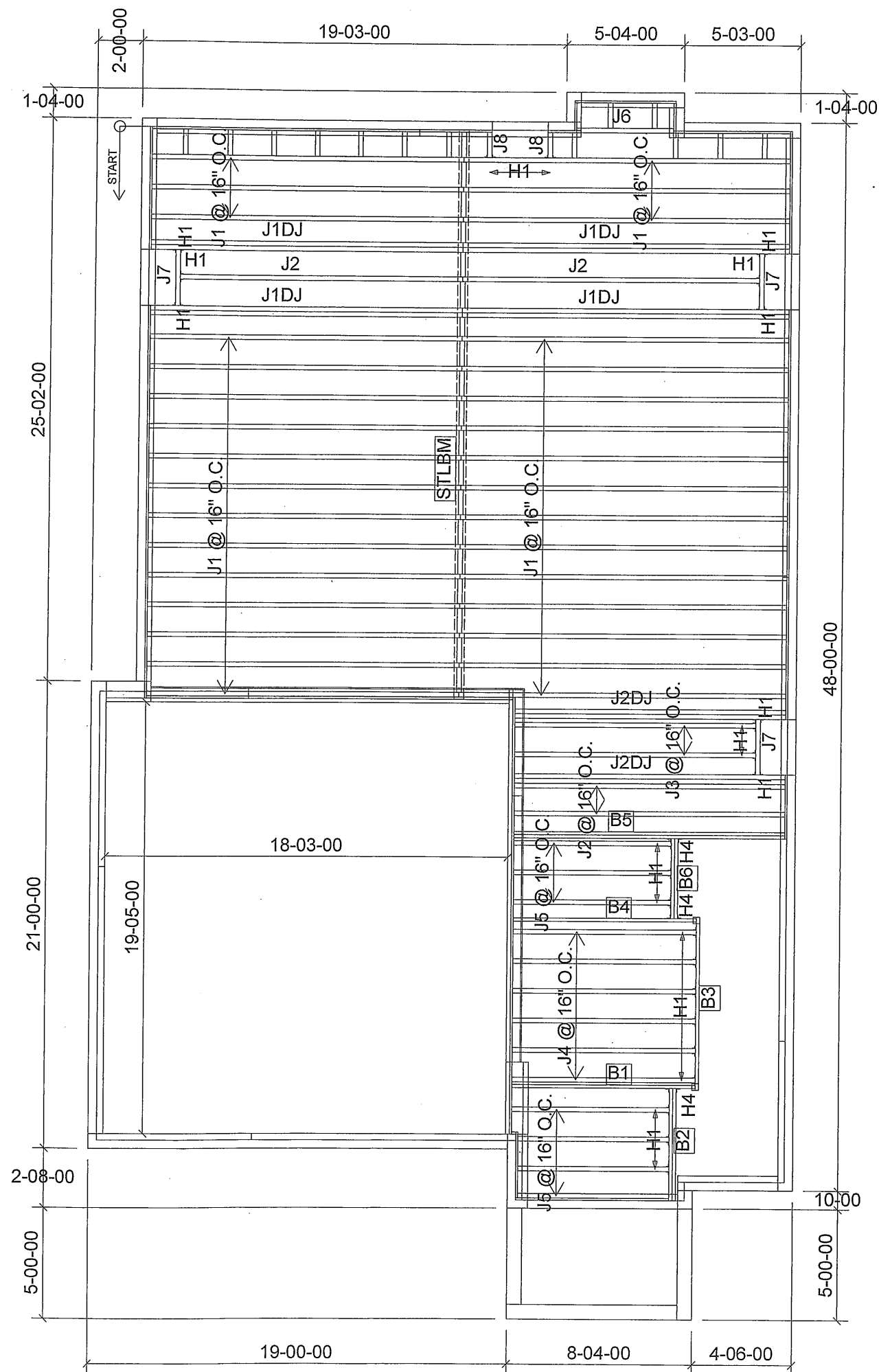
DESIGN LOADS: L/480.000

LIVE LOAD: 40.0 lb/ft<sup>2</sup>

DEAD LOAD: 15.0 lb/ft<sup>2</sup>

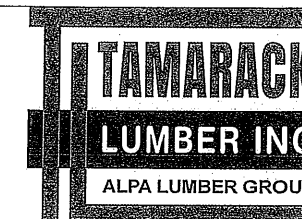
TILE LOAD: 20.0 lb/ft<sup>2</sup>

SUBFLOOR: 3/4" GLUED AND NAILED



Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	32
J1DJ	16-00-00	9 1/2" NI-40x	2	8
J2	14-00-00	9 1/2" NI-40x	1	4
J2DJ	14-00-00	9 1/2" NI-40x	2	4
J3	12-00-00	9 1/2" NI-40x	1	2
J4	10-00-00	9 1/2" NI-40x	1	6
J5	8-00-00	9 1/2" NI-40x	1	7
J6	6-00-00	9 1/2" NI-40x	1	1
J7	4-00-00	9 1/2" NI-40x	1	3
J8	2-00-00	9 1/2" NI-40x	1	2
B5	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B1	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B4	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B3	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B2	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B6	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2

Connector Summary		
Qty	Manuf	Product
6	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
2	H4	HGUS410
1	H4	HGUS410



FROM PLAN DATED: AUG 2020

BUILDER: ROYALPINE HOMES

SITE: CENTREFIELD

MODEL: 38-9 Bloomington

ELEVATION: A, B, C

LOT:

CITY: RICHMOND HILL

SALESMAN: WILL GARCIA

DESIGNER: LBV

REVISION:

#### NOTES:

REFER TO THE NORDIC INSTALLATION GUIDE FOR PROPER STORAGE AND INSTALLATION.

**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.F 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 7, TABLES 1 & 2. **CERAMIC TIL** APPLICATION AS PER O.B.C 9.30.6.

#### LOADING:

DESIGN LOADS: L/480.000

LIVE LOAD: 40.0 lb/ft<sup>2</sup>

DEAD LOAD: 15.0 lb/ft<sup>2</sup>

TILE LOAD: 20.0 lb/ft<sup>2</sup>

SUBFLOOR: 3/4" GLUED AND NAILED

CITY OF RICHMOND HILL  
BUILDING DIVISION

08/10/2021

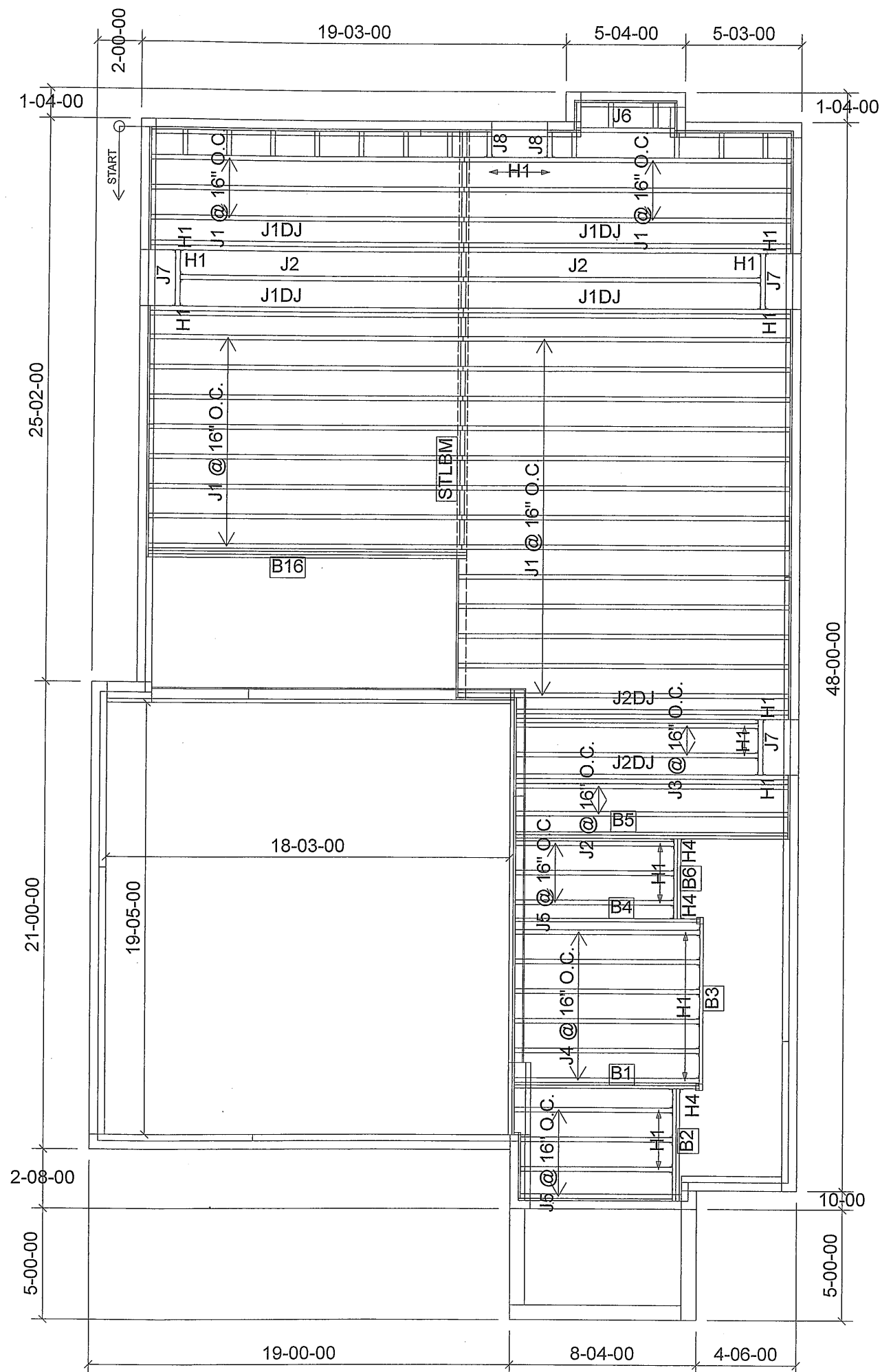
RECEIVED

Per: danielle.devitt

DATE: 2020-10-08

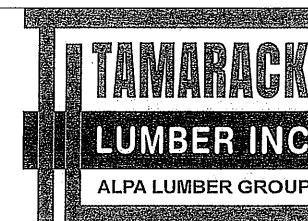
1st FLOOR





Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	27
J1DJ	16-00-00	9 1/2" NI-40x	2	8
J2	14-00-00	9 1/2" NI-40x	1	4
J2DJ	14-00-00	9 1/2" NI-40x	2	4
J3	12-00-00	9 1/2" NI-40x	1	2
J4	10-00-00	9 1/2" NI-40x	1	6
J5	8-00-00	9 1/2" NI-40x	1	7
J6	6-00-00	9 1/2" NI-40x	1	1
J7	4-00-00	9 1/2" NI-40x	1	3
J8	2-00-00	9 1/2" NI-40x	1	2
B16	16-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B5	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B1	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B4	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B3	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B2	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B6	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2

Connector Summary		
Qty	Manuf	Product
6	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
2	H4	HGUS410
1	H4	HGUS410



FROM PLAN DATED: AUG 2020

BUILDER: ROYALPINE HOMES

SITE: CENTREFIELD

MODEL: 38-9 Bloomington

ELEVATION: A, B, C

LOT:

CITY: RICHMOND HILL

SALESMAN: WILL GARCIA

DESIGNER: LBV

REVISION:

NOTES:

REFER TO THE NORDIC INSTALLATION GUIDE FOR PROPER STORAGE AND INSTALLATION.

**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.I 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 RE 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 7, TABLES 1 & 2. **CERAMIC TI** APPLICATION AS PER O.B.C 9.30.6.

LOADING:

DESIGN LOADS: L/480,000

LIVE LOAD: 40.0 lb/ft<sup>2</sup>

DEAD LOAD: 15.0 lb/ft<sup>2</sup>

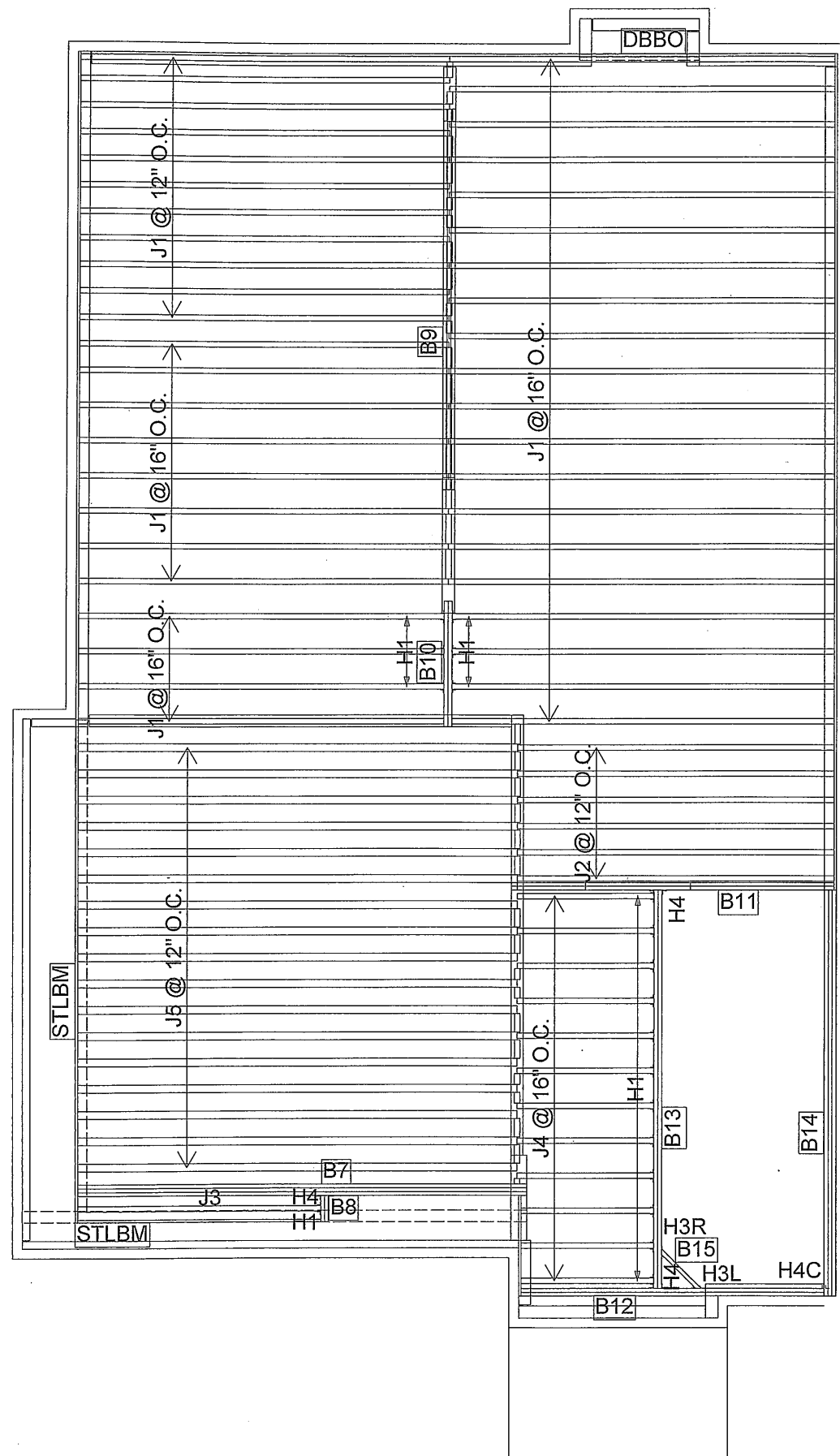
TILE LOAD: 20.0 lb/ft<sup>2</sup>

DATE: 2020-10-08

1st FLOOR

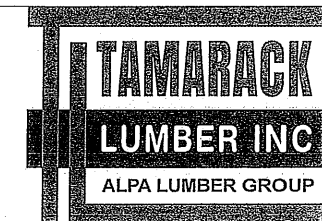
SUNKEN OPTION

SUBFLOOR: 3/4" GLUED AND NAILED



Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	43
J2	14-00-00	9 1/2" NI-40x	1	6
J3	10-00-00	9 1/2" NI-40x	1	1
J4	6-00-00	9 1/2" NI-40x	1	12
J5	18-00-00	9 1/2" NI-80	1	17
B7	18-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	3	3
B13	16-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B14	16-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	3	3
B11	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B12	12-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B10	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B15	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B8	2-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B9	16-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	3	3

Connector Summary		
Qty	Manuf	Product
19	H1	IUS2.56/9.5
1	H3L	SUL1.81/9
1	H3R	SUR1.81/9
1	N/A	HUC410
2	H4	HGUS410
1	H4	HGUS410



FROM PLAN DATED: AUG 2020

BUILDER: ROYALPINE HOMES

SITE: CENTREFIELD

MODEL: 38-9 Bloomington

ELEVATION: A

LOT:

CITY: RICHMOND HILL

SALESMAN: WILL GARCIA

DESIGNER: LBV

REVISION:

NOTES:

REFER TO THE NORDIC INSTALLATION GUIDE FOR PROPER STORAGE AND INSTALLATION.

**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.F 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 RE 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 7 TABLES 1 & 2. **CERAMIC TILE** APPLICATION AS PER O.B.C 9.30.6.

LOADING:

DESIGN LOADS: L/480.000

LIVE LOAD: 40.0 lb/ft<sup>2</sup>

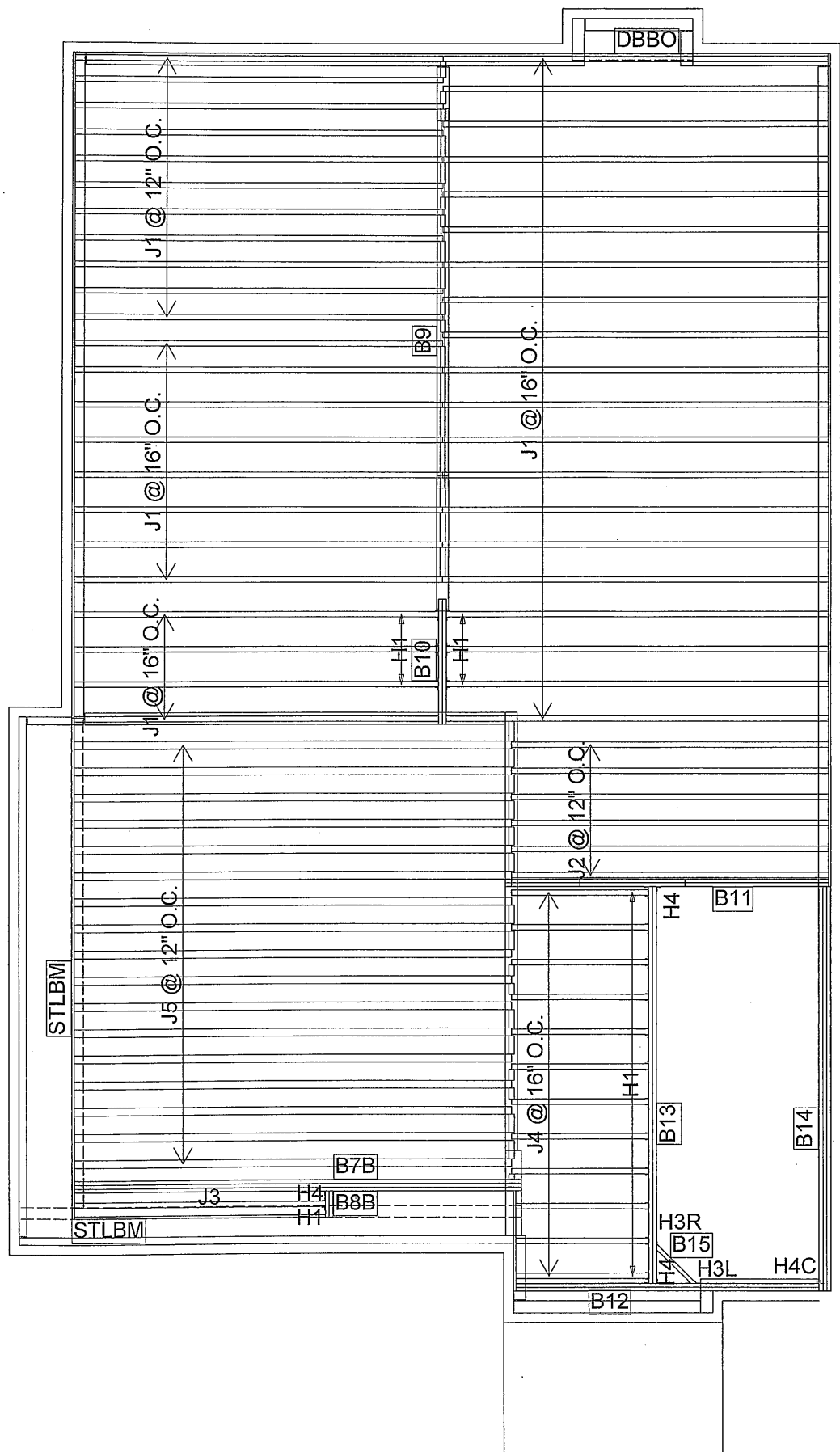
DEAD LOAD: 15.0 lb/ft<sup>2</sup>

TILE LOAD: 20.0 lb/ft<sup>2</sup>

DATE: 2020-10-20

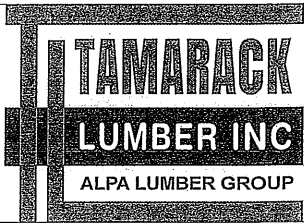
2ND FLOOR

SUBFLOOR: 5/8" GLUED AND NAILED



Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	43
J2	14-00-00	9 1/2" NI-40x	1	6
J3	10-00-00	9 1/2" NI-40x	1	1
J4	6-00-00	9 1/2" NI-40x	1	12
J5	18-00-00	9 1/2" NI-80	1	17
B7B	18-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	3	3
B13	16-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B14	16-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	3	3
B11	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B12	12-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B10	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B15	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B8B	2-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B9	16-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	3	3

Connector Summary		
Qty	Manuf	Product
19	H1	IUS2.56/9.5
1	H3L	SUL1.81/9
1	H3R	SUR1.81/9
1	N/A	HUC410
2	H4	HGUS410
1	H4	HGUS410



FROM PLAN DATED: AUG 2020

BUILDER: ROYALPINE HOMES

SITE: CENTREFIELD

MODEL: 38-9 Bloomington

ELEVATION: B

LOT:

CITY: RICHMOND HILL

SALESMAN: WILL GARCIA

DESIGNER: LBV

REVISION:

NOTES:  
REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.  
**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.I 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** RE 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 7, TABLES 1 & 2. **CERAMIC TI** APPLICATION AS PER O.B.C 9.30.6.

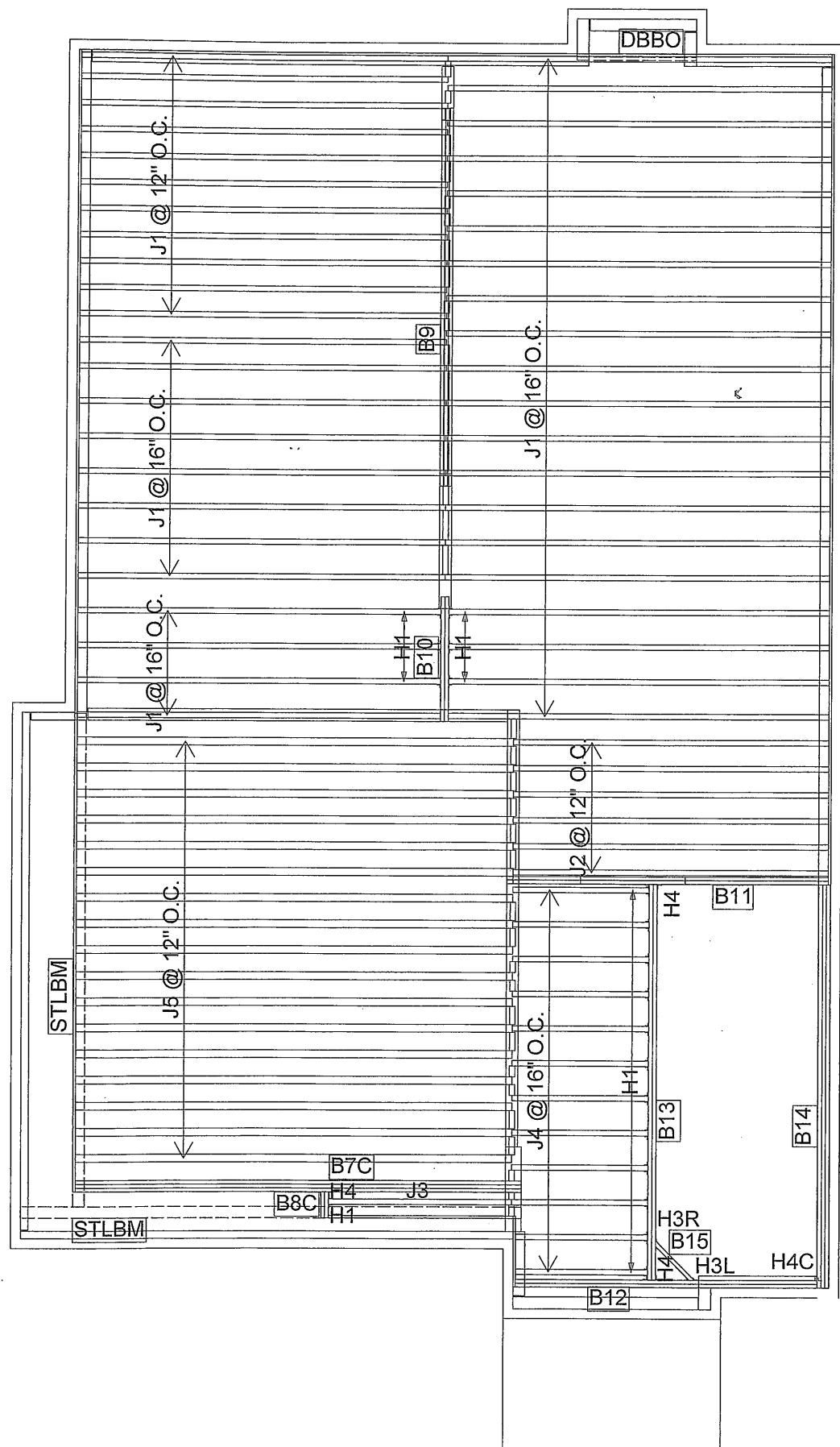
LOADING:  
DESIGN LOADS: L/480.000  
LIVE LOAD: 40.0 lb/ft<sup>2</sup>  
DEAD LOAD: 15.0 lb/ft<sup>2</sup>  
TILE LOAD: 20.0 lb/ft<sup>2</sup>

DATE: 2020-10-20

2ND FLOOR

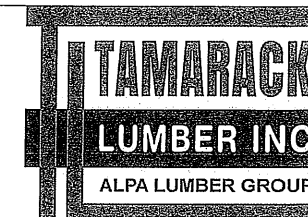
SUBFLOOR: 5/8" GLUED AND NAILED





Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	43
J2	14-00-00	9 1/2" NI-40x	1	6
J3	8-00-00	9 1/2" NI-40x	1	1
J4	6-00-00	9 1/2" NI-40x	1	12
J5	18-00-00	9 1/2" NI-80	1	17
B7C	18-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	3	3
B13	16-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B14	16-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	3	3
B11	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B12	12-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B10	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B15	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B8C	2-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B9	16-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	3	3

Connector Summary		
Qty	Manuf	Product
19	H1	IUS2.56/9.5
1	H3L	SUL1.81/9
1	H3R	SUR1.81/9
1	N/A	HUC410
2	H4	HGUS410
1	H4	HGUS410



FROM PLAN DATED: AUG 2020

BUILDER: ROYALPINE HOMES

SITE: CENTREFIELD

MODEL: 38-9 Bloomington

ELEVATION: C

LOT:

CITY: RICHMOND HILL

SALESMAN: WILL GARCIA

DESIGNER: LBV

REVISION:

#### NOTES:

REFER TO THE NORDIC INSTALLATION GUIDE FOR PROPER STORAGE AND INSTALLATION.

**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.I 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 RE 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 7, TABLES 1 & 2. **CERAMIC TILE** APPLICATION AS PER O.B.C 9.30.6.

#### LOADING:

DESIGN LOADS: L/480,000

LIVE LOAD: 40.0 lb/ft<sup>2</sup>


DEAD LOAD: 15.0 lb/ft<sup>2</sup>

TILE LOAD: 20.0 lb/ft<sup>2</sup>

DATE: 2020-10-20

2ND FLOOR

SUBFLOOR: 5/8" GLUED AND NAILED

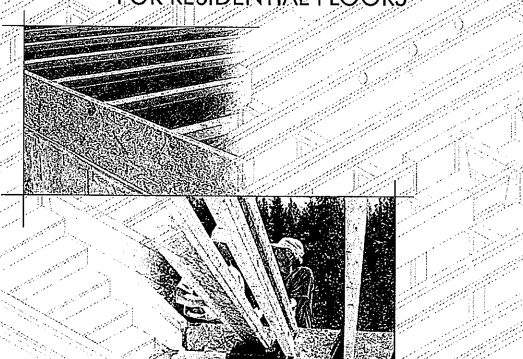
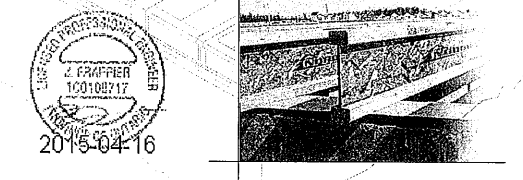



# NORDIC

ENGINEERED WOOD

## INSTALLATION GUIDE


FOR RESIDENTIAL FLOORS

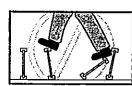


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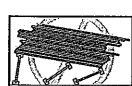
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**SAFETY AND CONSTRUCTION PRECAUTIONS**



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



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

**WARNING**

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:**

- 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.
- 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" 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.
- For cantilevered I-joists, brace top and bottom flanges, and brace ends with diastole panels, rim board, or cross-bridging.
- 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.
- 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.

**STORAGE AND HANDLING GUIDELINES**

- Bundle wrap can be slippery when wet. Avoid walking on wrapped bundles.
- Store, stack, and handle I-joists vertically and level only.
- Always stack and handle I-joists in the upright position only.
- Do not store I-joists in direct contact with the ground and/or flatwise.
- Protect I-joists from weather, and use spacers to separate bundles.
- Bundled units should be kept intact until time of installation.
- When handling I-joists with a crane on the job site, take a few simple precautions to prevent damage to the I-joists and injury to your work crew.
  - Pick I-joists in bundles as shipped by the supplier.
  - Orient the bundles so that the webs of the I-joists are vertical.
  - Pick the bundles at the 5th points, using a spreader bar if necessary.
- Do not handle I-joists in a horizontal orientation.
- NEVER USE OR TRY TO REPAIR A DAMAGED I-JOIST.

**MAXIMUM FLOOR SPANS**

- Maximum clear spans applicable to simple-span or multiple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration and a live load deflection limit of L/480. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for joist spacing of 19.2 inches or less, or 3/4 inch for joist spacing of 24 inches. Adhesive shall meet the requirements given in CGS-71.26 Standard. No concrete topping or bridging element was assumed. Increased spans may be achieved with the use of gypsum and/or a row of blocking at mid-span.
- Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
- Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
- This span chart is based on uniform loads. For applications with other than uniform loads, an engineering analysis may be required based on the use of the design properties.
- Tables are based on Limit States Design per CAN/CSA O86-09 Standard, and NBC 2010.
- SI units conversion: 1 inch = 25.4 mm  
1 foot = 0.305 m

**MAXIMUM FLOOR SPANS FOR NORDIC I-JOISTS**  
SIMPLE AND MULTIPLE SPANS

Joist Depth	Joist Series	Simple spans				Multiple spans				
		On centre spacing	12"	16"	19.2"	On centre spacing	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-1"	14'-2"	13'-9"	13'-5"	16'-3"	15'-4"	14'-10"	14'-7"	
	NI-40x	16'-1"	15'-2"	14'-8"	14'-9"	17'-5"	16'-5"	15'-10"	15'-5"	
	NI-60	16'-3"	15'-4"	14'-10"	14'-11"	17'-7"	16'-7"	16'-0"	16'-1"	
	NI-70	17'-1"	16'-1"	15'-6"	15'-7"	18'-7"	17'-4"	16'-9"	16'-10"	
	NI-80	17'-3"	16'-3"	15'-8"	15'-9"	18'-10"	17'-6"	16'-11"	17'-0"	
11-7/8"	NI-20	16'-11"	16'-0"	15'-9"	15'-6"	18'-4"	17'-3"	16'-8"	16'-7"	
	NI-40x	18'-1"	17'-0"	16'-5"	16'-6"	20'-0"	18'-9"	18'-0"	17'-7"	
	NI-60	18'-4"	17'-3"	16'-7"	16'-9"	20'-3"	18'-9"	18'-0"	18'-1"	
	NI-70	19'-6"	18'-0"	17'-4"	17'-5"	21'-6"	19'-11"	19'-0"	19'-1"	
	NI-80	19'-9"	18'-3"	17'-6"	17'-7"	21'-9"	20'-2"	19'-3"	19'-4"	
14"	NI-20	20'-2"	18'-7"	17'-11"	17'-11"	22'-3"	20'-7"	19'-8"	19'-9"	
	NI-40x	20'-1"	18'-7"	17'-10"	17'-11"	22'-2"	20'-6"	19'-8"	19'-4"	
	NI-60	20'-5"	18'-11"	18'-1"	18'-2"	22'-7"	20'-11"	20'-0"	20'-1"	
	NI-70	21'-7"	20'-0"	19'-1"	19'-2"	23'-10"	21'-1"	21'-1"	21'-2"	
	NI-80	21'-11"	20'-3"	19'-4"	19'-5"	24'-3"	22'-5"	21'-5"	21'-6"	
16"	NI-20	22'-5"	20'-8"	19'-9"	19'-10"	24'-9"	22'-10"	21'-10"	21'-10"	
	NI-40x	22'-7"	20'-11"	19'-11"	20'-0"	25'-0"	23'-1"	22'-0"	22'-2"	
	NI-60	23'-6"	21'-9"	20'-9"	20'-10"	26'-0"	24'-0"	22'-11"	23'-0"	
	NI-70	23'-6"	21'-9"	20'-9"	20'-10"	26'-0"	24'-0"	22'-11"	23'-0"	
	NI-80	23'-11"	22'-1"	21'-1"	21'-2"	26'-5"	24'-5"	23'-3"	23'-4"	
NI-90	24'-5"	22'-6"	21'-6"	21'-6"	26'-11"	24'-10"	23'-9"	23'-9"		
NI-90x	24'-8"	22'-9"	21'-9"	21'-10"	27'-3"	25'-2"	24'-0"	24'-1"		

**WEB STIFFENERS**

**RECOMMENDATIONS:**

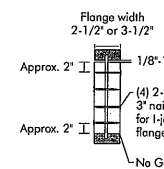
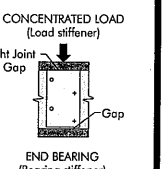
■ A **bearing stiffener** is required in all engineered applications with factored reactions greater than shown in the I-joist properties table found in the I-joist Construction Guide (C101). The gap between the stiffener and the flange is at the top.

■ A **load stiffener** is required when the I-joist is supported in a hanger and the sides of the hanger do not extend up to, and support, the top flange. The gap between the stiffener and flange is at the top.

■ A **load stiffener** is required at locations where a factored concentrated load greater than 2,370 lbs is applied to the top flange between supports, or in the case of a cantilever, anywhere between the cantilever tip and the support. These values are for standard term load duration, and may be adjusted for other load durations as permitted by the code. The gap between the stiffener and the flange is at the bottom.

SI units conversion: 1 inch = 25.4 mm

**FIGURE 2**  
**WEB STIFFENER INSTALLATION DETAILS**

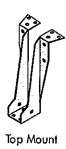
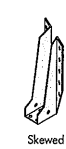




See table below for web stiffener size requirements

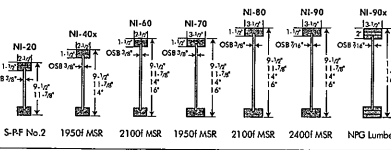
Flange Width	Web Stiffener Size Each Side of Web
2-1/2"	1" x 2-5/16" minimum width
3-1/2"	1-1/2" x 2-5/16" minimum width

**I-JOIST HANGERS**

- Hangers shown illustrate the three most commonly used metal hangers to support I-joists.
- All nailing must meet the hanger manufacturer's recommendations.
- Hangers should be selected based on the joist depth, flange width and load capacity based on the maximum spans.
- Web stiffeners are required when the sides of the hangers do not laterally brace the top flanges of the I-joist.

**NORDIC I-JOIST SERIES**



33 pieces per unit

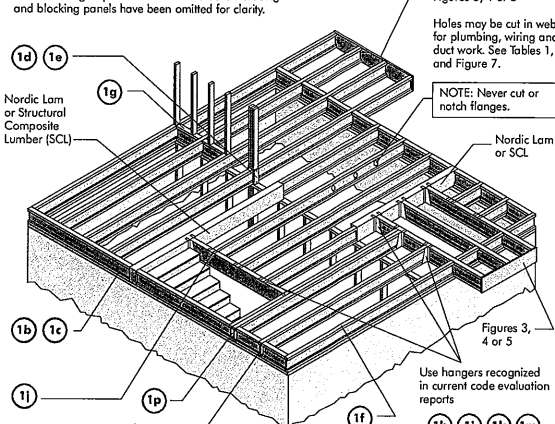
Chantiers Chibougamau Ltd. harvests its own trees, which enables Nordic products to adhere to strict quality control procedures throughout the manufacturing process. Every phase of the operation, from forest to the finished product, reflects our commitment to quality.

Nordic Engineered Wood I-joists use only finger-jointed black spruce lumber in their flanges, ensuring consistent quality, superior strength and longer span carrying capacity.

**INSTALLING NORDIC I-JOISTS**

- Before laying out floor system components, verify that I-joist flange widths match hanger widths. If not, supplier.
- Except for cutting to length, I-joist flanges should **never** be cut, drilled, or notched.
- Install I-joists so that top and bottom flanges are within 1/2 inch of true vertical alignment.
- I-joists must be anchored securely to supports before floor sheathing is attached, and supports for I-joists must be level.
- Minimum bearing lengths: 1-3/4 inches for end bearings and 3-1/2 inches for intermediate bearings.
- When using hangers, seat I-joists firmly in hanger bottoms to minimize settlement.
- Leave a 1/16-inch gap between the I-joist end and a header.
- Concentrated loads greater than those that can normally be expected in residential construction should only be applied to the top surface of the top flange. Normal concentrated loads include track lighting fixtures, audio equipment and security cameras. Never suspend unusual or heavy loads from the I-joist's bottom flange. Whenever possible, suspend all concentrated loads from the top of the I-joist. Or, attach the load to blocking that has been securely fastened to the I-joist webs.
- Never install I-joists where they will be permanently exposed to weather, or where they will remain in direct contact with concrete or masonry.
- Restrain ends of floor joists to prevent rollover. Use rim board, rim joists or I-joist blocking panels.
- For I-joists installed over and beneath bearing walls, use full depth blocking panels, rim board, or squash blocks (cripple members) to transfer gravity loads from the floor system to the wall or foundation below.
- Due to shrinkage, common framing lumber set on edge **may never** be used as blocking or rim boards. I-joist blocking panels or other engineered wood products – such as rim board – must be cut to fit between the I-joists, and an I-joist-compatible depth selected.
- Provide permanent lateral support of the bottom flange of all I-joists at interior supports of multiple-span joists. Similarly, support the bottom flange of all cantilevered I-joists at the end support rest to the cantilever extension. In the completed structure, the gypsum wallboard ceiling provides this lateral support. Until the final finished ceiling is applied, temporary bracing or struts must be used.
- If square-edge panels are used, edges must be supported between I-joists with 2x4 blocking. Glue panels to blocking to minimize squeaks. Blocking is not required under structural finish flooring, such as wood strip flooring, or if a separate underlayment layer is installed.
- Nail spacing: Space nails installed to the flange's top face in accordance with the applicable building code requirements or approved building plans.

**FIGURE 1**  
**TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS**



Some framing requirements such as erection bracing and blocking panels have been omitted for clarity.

Figures 3, 4 or 5

Holes may be cut in web for plumbing, wiring and duct work. See Tables 1, 2 and Figure 7.

NOTE: Never cut or notch flanges.

Nordic Lam or SCL

Nordic Lam or SCL

Use hangers recognized in current code evaluation reports

All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for clarity.

**1a** NI 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 decking)

Attach I-joist to top plate per detail 1b

Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
NI Joists	3,300

\*The uniform vertical load is limited to a joist depth of 16 inches or less and is based on standard term load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer, see detail 1d.

**1b** Rim board

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

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

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

Minimum bearing length shall be 1-3/4" for the end bearings, and 3-1/2" for the intermediate bearings when applicable.

Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
1-1/8" Rim Board Plus	8,090

\*The uniform vertical load is limited to a rim board depth of 16 inches or less and is based on standard term load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer, see detail 1d.

**1c** NI rim joist per detail 1a

Attach rim joist to floor joist with one nail at top and bottom. Nail must provide 1 inch minimum penetration into floor joist. Toe-nailing may be used.

NI rim joist per detail 1a

Attach I-joist per detail 1b

Minimum 1-3/4" bearing required

**1d** NI or rim board blocking panel per detail 1a

Squash block

Pair of Squash Blocks

	Maximum Factored Vertical per Pair of Squash Blocks (lbs)
2x Lumber	5,500
1-1/8" Rim Board Plus	4,300

Provide lateral bracing per detail 1a, 1b, or 1c

**1e** Transfer load from above to bearing below. Install squash blocks per detail 1d. Match bearing area of blocks below to post above.

Wall sheathing, as required

Rim board may be used in lieu of I-joists. Backer is not required when rim board is used. Bracing per code shall be carried to the foundation.

**1f** Use single I-joist for loads up to 3,300 plf, double I-joists for loads up to 6,600 plf (filler block not required). Attach I-joist to top plate using 2-1/2" nails at 6" o.c.

Provide backer for siding attachment unless nailable sheathing is used.

Kim board may be used in lieu of I-joists. Backer is not required when kim board is used. Bracing per code shall be carried to the foundation.

**1g** Load bearing wall above shall align vertically with the bearing below. Other conditions, such as offset bearing walls, are not covered by this detail.

Blocking required over all interior supports under load-bearing walls or when floor joists are not continuous over support

NI blocking panel per detail 1e

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

Joist attachment per detail 1b

**1h** Backer block (use if hanger load exceeds 360 lbs) 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 right to top flange. Use twelve 3" nails, clinched when possible. Maximum factored resistance for hanger for this detail = 1,620 lbs.

Double I-joist header

Top- or face-mount hanger

Filler block per detail 1p

Backer block required (both sides for face-mount hangers)

For hanger capacity see hanger manufacturer's recommendations. Verify double I-joist capacity to support concentrated loads.

**1i** Top- or face-mount hanger installed per manufacturer's recommendations

For nailing schedules for multiple beams, see the manufacturer's recommendations.

Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

**1j** Nordic Lam or SCL

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

Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

**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

Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

**1l** Multiple I-joist header with full depth filler block shown. Nordic Lam or SCL headers may also be used. Verify double I-joist capacity to support concentrated loads.

Filler block per detail 1p

Install hanger per manufacturer's recommendations

Backer block attached per detail 1h. Nail with twelve 3" nails, clinch when possible.

Maximum support capacity = 1,620 lbs.

**1m** Do not bevel-cut joist beyond inside face of wall

Attach I-joist per detail 1b

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

**1n** Lumber 2x4 min., extend block to face of adjacent web. Two 2-1/2" spiral nails from each web to lumber piece, alternate on opposite side.

NI blocking panel

Optional: Minimum 1x4 inch strap applied to underside of joist at blocking line or 1/2 inch minimum gypsum ceiling attached to underside of joists.

**1o** One 2-1/2" nails at top and bottom flange

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

2x4 min. (1/8" gap minimum)

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


I-joist blocking panel

One 2-1/2" nails one side only

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

Notes:

- In some local codes, blocking is prescriptively required in the first joist space (or first and second joist space) next to the starter joist. Where required, see local code requirements for spacing of the blocking.
- All nails are common spiral in this detail.



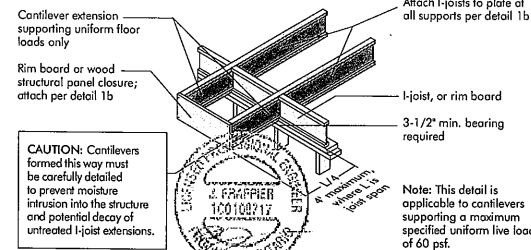
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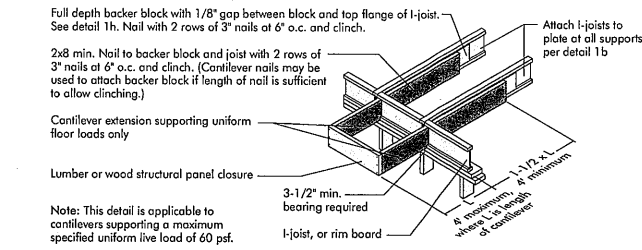


## CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)

### 3a) I-JOIST CANTILEVER DETAIL FOR BALCONIES (No Wall Load)

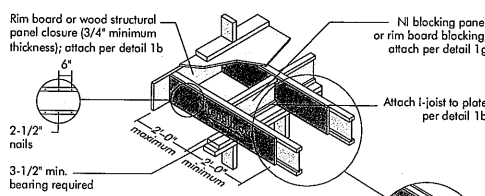


### 3b) LUMBER CANTILEVER DETAIL FOR BALCONIES (No Wall Load)



## CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET (CONCENTRATED WALL LOAD)

### 4a) Method 1 — SHEATHING REINFORCEMENT ONE SIDE

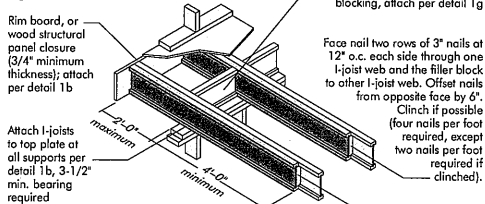


### Method 2 — SHEATHING REINFORCEMENT TWO SIDES

- Use same installation as Method 1 but reinforce both sides of I-joist with sheathing.
- Use nailing pattern shown for Method 1 with opposite face nailing offset by 3'.

Note: Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4 inch) required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2 inch nails at 6 inch o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail 1b. Verify reinforced I-joist capacity.

### 4b) Alternate Method 2 — DOUBLE I-JOIST



Block I-joists together with filler blocks for the full length of the reinforcement. For I-joist flange widths greater than 3 inches place an additional row of 3 inch nails along the centreline of the reinforcing panel from each side. Clinch when possible.

### FIGURE 4 (continued)



### CANTILEVER REINFORCEMENT METHODS ALLOWED

JOIST DEPTH (in.)	ROOF TRUSS SPAN (ft)	LL = 30 psf, DL = 15 psf				LL = 40 psf, DL = 15 psf				LL = 50 psf, DL = 15 psf			
		12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
9-1/2"	26	N	N	1	2	N	1	2	X	N	2	X	X
	28	N	N	1	X	N	1	2	X	N	2	X	X
	30	N	N	1	X	N	1	2	X	N	2	X	X
	32	N	N	1	2	X	N	2	X	X	1	X	X
11-7/8"	26	N	N	1	2	N	1	2	X	N	2	X	X
	28	N	N	1	X	N	1	2	X	N	2	X	X
	30	N	N	1	X	N	1	2	X	N	2	X	X
	32	N	N	1	2	X	N	2	X	X	1	X	X
14"	26	N	N	1	2	N	1	2	X	N	2	X	X
	28	N	N	1	X	N	1	2	X	N	2	X	X
	30	N	N	1	X	N	1	2	X	N	2	X	X
	32	N	N	1	2	X	N	2	X	X	1	X	X
16"	26	N	N	1	2	N	1	2	X	N	2	X	X
	28	N	N	1	X	N	1	2	X	N	2	X	X
	30	N	N	1	X	N	1	2	X	N	2	X	X
	32	N	N	1	2	X	N	2	X	X	1	X	X

1. N = No reinforcement required.
- 1 = NI reinforced with 3/4" wood structural panel on one side only.
- 2 = NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.
- X = Try a deeper joist or closer spacing.
2. Maximum design load shall be: 15 psf roof dead load, 55 psf floor total load, and 80 psf wall load. Wall load is based on 3'-0" maximum width window or door openings.
3. For larger openings, or multiple 3'-0" wide openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
3. Table applies to joists 12" to 24" o.c. that meet the floor span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

## BRICK CANTILEVER REINFORCEMENT METHODS ALLOWED

JOIST DEPTH (in.)	ROOF TRUSS SPAN (ft)	LL = 30 psf, DL = 15 psf				LL = 40 psf, DL = 15 psf				LL = 50 psf, DL = 15 psf			
		12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
9-1/2"	26	N	N	1	2	N	1	2	X	N	2	X	X
	28	N	N	1	X	N	1	2	X	N	2	X	X
	30	N	N	1	X	N	1	2	X	N	2	X	X
	32	N	N	1	2	X	N	2	X	X	1	X	X
11-7/8"	26	N	N	1	2	N	1	2	X	N	2	X	X
	28	N	N	1	X	N	1	2	X	N	2	X	X
	30	N	N	1	X	N	1	2	X	N	2	X	X
	32	N	N	1	2	X	N	2	X	X	1	X	X
14"	26	N	N	1	2	N	1	2	X	N	2	X	X
	28	N	N	1	X	N	1	2	X	N	2	X	X
	30	N	N	1	X	N	1	2	X	N	2	X	X
	32	N	N	1	2	X	N	2	X	X	1	X	X
16"	26	N	N	1	2	N	1	2	X	N	2	X	X
	28	N	N	1	X	N	1	2	X	N	2	X	X
	30	N	N	1	X	N	1	2	X	N	2	X	X
	32	N	N	1	2	X	N	2	X	X	1	X	X

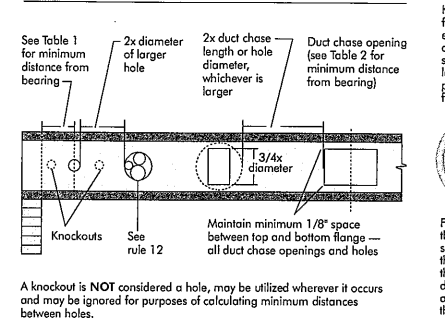
1. N = No reinforcement required.
- 1 = NI reinforced with 3/4" wood structural panel on one side only.
- 2 = NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.
- X = Try a deeper joist or closer spacing.
2. Maximum design load shall be: 15 psf roof dead load, 55 psf floor total load, and 80 psf wall load. Wall load is based on 3'-0" maximum width window or door openings.
3. For larger openings, or multiple 3'-0" wide openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
3. Table applies to joists 12" to 24" o.c. that meet the floor span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

## WEB HOLES

### RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

1. The distance between the inside edge of the support and the centreline of any hole or duct opening shall be in compliance with the requirements of Table 1 or 2, respectively.
2. I-joist top and bottom flanges must NEVER be cut, notched, or otherwise modified.
3. Whenever possible, field-cut holes should be centred on the middle of the web.
4. The maximum size hole or the maximum depth of a duct chase opening that can be cut into an I-joist web shall equal the clear distance between the flanges of the I-joist minus 1/4 inch. A minimum of 1/8 inch should always be maintained between the top or bottom of the hole or opening and the adjacent I-joist flange.
5. The sides of square holes or longest sides of rectangular holes should not exceed 3/4 of the diameter of the maximum round hole permitted at that location.
6. Where more than one hole is necessary, the distance between adjacent hole edges shall exceed twice the diameter of the largest round hole or twice the size of the largest square hole (or twice the length of the longest side of the longest rectangular hole or duct chase opening) and each hole and duct chase opening shall be sized and located in compliance with the requirements of Tables 1 and 2, respectively.
7. A knockout is not considered a hole, may be utilized anywhere it occurs, and may be ignored for purposes of calculating minimum distances between holes and/or duct chase openings.
8. Holes measuring 1-1/2 inches or smaller shall be permitted anywhere in a cantilevered section of a joist. Holes of greater size may be permitted subject to verification.
9. A 1-1/2 inch hole or smaller can be placed anywhere in the web provided that it meets the requirements of rule number 6 above.
10. All holes and duct chase openings shall be cut in a workman-like manner in accordance with the restrictions listed above and as illustrated in Figure 7.
11. Limit three maximum size holes per span, of which one may be a duct chase opening.
12. A group of round holes of approximately the same location shall be permitted if they meet the requirements for a single round hole circumscribed around them.

### FIGURE 7 FIELD-CUT HOLE LOCATOR



Knockouts are precut holes provided for the contractor's convenience to install electrical or small plumbing lines. They are 1-1/2 inches in diameter, and are spaced 15 inches on centre along the length of the I-joist. Where possible, it is preferable to use knockouts instead of field-cut holes.

Never drill, cut or notch the flange, or over-cut the web. Holes in webs should be cut with a sharp saw.

For rectangular holes, avoid over-cutting the corners, as this can cause unnecessary stress concentrations. Slightly rounding the corners is recommended. Starting the rectangular hole by drilling a 1-inch diameter hole in each of the four corners and then making the cuts between the holes is another good method to minimize damage to the I-joist.

## INSTALLING THE GLUED FLOOR SYSTEM

1. Wipe any mud, dirt, water, or ice from I-joist flanges before gluing.
2. Snap a chalk line across the I-joists four feet in from the wall for panel edge alignment and as a boundary for spreading glue.
3. Spread only enough glue to lay one or two panels at a time, or follow specific recommendations from the glue manufacturer.
4. Lay the first panel with tongue side to the wall, and nail in place. This protects the tongue of the next panel from damage when tapped into place with a block and sledgehammer.
5. Apply a continuous line of glue (about 1/4-inch diameter) to the top flange of a single I-joist. Apply glue in a winding pattern on wide areas, such as with double I-joists.
6. Apply two lines of glue on I-joists where panel ends butt to ensure proper gluing of each end.
7. After the first row of panels is in place, spread glue in the groove of one or two panels at a time before laying the next row. Glue line may be continuous or spaced, but avoid squeeze-out by applying a thinner line (1/8 inch) than used on I-joist flanges.
8. Tap the second row of panels into place, using a block to protect groove edges.
9. Stagger and joints in each succeeding row of panels. A 1/8-inch space between all end joints and 1/8-inch at all edges, including T&G edges, is recommended. (Use a spacer tool or an 1-1/2" common nail to assure accurate and consistent spacing.)
10. Complete all nailing of each panel before glue sets. Check the manufacturer's recommendations for cure time. (Warm weather accelerates glue setting.) Use 2" ring- or screw-shank nails for panels 3/4-inch thick or less, and 2-1/2" ring- or screw-shank nails for thicker panels. Space nails per the table below. Closer nail spacing may be required by some codes, or for diaphragm construction. The finished deck can be walked on right away and will carry construction loads without damage to the glue bond.

### FASTENERS FOR SHEATHING AND SUBFLOORING<sup>(1)</sup>

Maximum Joist Spacing (in.)	Minimum Panel Thickness (in.)	Nail Size and Type				Maximum Spacing of Fasteners	
		Common Wire or Spiral Nails	Ring Thread Nails or Screws	Staples	Edges		
					Interm. Supports		
16	5/8	2"	1-3/4"	2"	6"	12"	
20	5/8	2"	1-3/4"	2"	6"	12"	
24	3/4	2"	1-3/4"	2"	6"	12"	

1. Fasteners of sheathing and subflooring shall conform to the above table.
2. Staples shall not be less than 1/16-inch in diameter or thickness, with not less than a 3/8-inch crown driven with the crown parallel to framing.
3. Flooring screws shall not be less than 1/8-inch in diameter.
4. Special conditions may impose heavy traffic and concentrated loads that require construction in excess of the minimums shown.
5. Use only adhesives conforming to CAN/CGSB-71.26 Standard, Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems, applied in accordance with the manufacturer's recommendations. If OSB panels with sealed surfaces and edges are to be used, use only solvent-based glues; check with panel manufacturer.

Ref.: NRC-CNRC, National Building Code of Canada 2010, Table 9.23.3.5.

### IMPORTANT NOTE:

Floor sheathing must be field glued to the I-joist flanges in order to achieve the maximum spans shown in this document. If sheathing is nailed only, I-joist spans must be verified with your local distributor.

### TABLE 1 LOCATION OF CIRCULAR HOLES IN JOIST WEBS Simple or Multiple Span for Dead Loads up to 15 psf and Live Loads up to 40 psf

Joist Depth	Joist Series	Minimum distance from inside face of any support to centre of hole (ft.-in.)												Span adjustment Factor
		2	3	4	5	6	6-1/4	7	8	8-5/8	9	10	10-3/4	
9-1/2"	N-20	0-7"	1-0"	2-10"	4-3"	5-8"	6-0"	...	...	...	...	...	...	13-6"
	N-40	0-7"	1-0"	2-10"	4-3"	5-8"	6-0"	...	...	...	...	...	...	14-9"
	N-60	1-3"	2-6"	4-0"	5-4"	7-0"	7-5"	...	...	...	...	...	...	14-11"
	N-80	2-3"	3-6"	5-0"	6-4"	8-0"	8-4"	...	...	...	...	...	...	15-0"
11-7/8"	N-20	0-7"	0-8"	1-0"	2-4"	3-8"	4-0"	5-0"	6-4"	7-9"	...	...	...	15-6"
	N-40	0-7"	0-8"	1-0"	2-4"	3-8"	4-0"	5-0"	6-4"	7-9"	...	...	...	16-9"
	N-60	1-3"	2-6"	4-0"	5-4"	6-9"	7-2"	8-4"	10-0"	11-2"	...	...	...	17-5"
	N-80	1-6"	2-10"	4-2"	5-6"	7-3"	8-6"	10-3"	11-4"	...	...	...	...	17-9"
14"	N-20	0-7"	0-8"	1-5"	3-2"	4-10"	5-4"	6-9"	8-9"	10-2"	...	...	...	17-11"
	N-40	0-7"	0-8"	1-5"	3-2"	4-10"	5-4"	6-9"	8-9"	10-2"	...	...	...	18-0"
	N-60	1-3"	2-6"	4-0"	5-4"	6-9"	7-2"	8-4"	10-0"	11-2"	...	...	...	19-0"
	N-80	1-6"	2-10"	4-2"	5-6"	7-3"	8-6"	10-3"	11-4"	...	...	...	...	19-5"
16"	N-20	0-7"	0-8"	1-5"	3-2"	4-10"	5-4"	6-9"	8-9"	10-2"	...	...	...	20-0"
	N-40	0-7"	0-8"	1-5"	3-2"	4-10"	5-4"	6-9"	8-9"	10-2"	...	...	...	20-0"
	N-60	1-3"	2-6"	4-0"	5-4"	6-9"	7-2"	8-4"	10-0"	11-2"	...	...	...	21-0"
	N-80	1-6"	2-10"	4-2"	5-6"	7-3"	8-6"	10-3"	11-4"	...	...	...	...	21-0"

1. Above table may be used for I-joist spacing of 24 inches on centre or less.
  2. Hole location distance is measured from inside face of supports to centre of hole.
  3. Distances in this chart are based on uniformly loaded joists.
- OPTIONAL:  
The above table is based on the I-joists used at their maximum span. If the I-joists are placed at less than their full maximum span (see Maximum Span Table), the minimum distance from the centreline of the hole to the face of any support (D) as given above may be reduced as follows:  
Reduced =  $\frac{\text{actual}}{\text{max}} \times D$   
Where:  
Reduced = Distance from the inside face of any support to centre of hole, reduced for less-than-maximum span applications (ft.-in.)  
actual = The actual measured span distance between the inside faces of supports (ft.)  
max = Span Adjustment Factor given in this table.  
D = The minimum distance from the inside face of any support to centre of hole from this table.  
If actual is greater than 1, use 1 in the above calculation for actual.

### TABLE 2 DUCT CHASE OPENING SIZES AND LOCATIONS — Simple Span Only

Joist Depth	Joist Series	Minimum distance from inside face of any support to centre of opening (ft.-in.)											
		Duct chase length (in.)											
		8	10	12	14	16	18	20	22	24			
9-1/2"	N-20	5-1"	5-4"	5-8"	6-1"	6-4"	6-7"	7-1"	7-5"	7-8"	7-1"	7-5"	
	N-40	5-3"	5-8"	6-0"	6-3"	6-7"	7-1"	7-5"	8-0"	8-2"	8-0"	7-5"	
	N-60	5-3"	5-8"	6-2"	6-7"	7-1"	7-5"	8-0"	8-3"	8-6"	8-3"	7-5"	
	N-70	5-3"	5-8"	6-2"	6-7"	7-1"	7-5"	8-0"	8-3"	8-6"	8-3"	7-5"	
	N-80	5-3"	5-8"	6-4"	6-7"	7-1"	7-5"	8-0"	8-3"	8-6"	8-3"	7-5"	
11-7/8"	N-20	5-9"	6-2"	6-6"	7-1"	7-5"	7-9"	8-3"	8-9"	9-4"	9-4"	9-4"	
	N-40	6-2"	6-6"	7-0"	7-4"	7-8"	8-2"	8-6"	9-0"	9-4"	9-4"	9-4"	
	N-60	7-3"	7-8"	8-0"	8-4"	8-8"	9-2"	9-6"	10-0"	10-3"	11-0"	11-0"	
	N-70	7-3"	7-7"	8-0"	8-5"	8-10"	9-3"	9-7"	10-1"	10-4"	10-8"	11-0"	
	N-80	7-4"	7-11"	8-4"	8-9"	9-2"	9-7"	10-1"	10-7"	10-7"	10-7"	10-7"	
14"	N-20	6-3"	6-5"	6-10"	7-0"	7-4"	7-8"	8-2"	8-6"	9-0"	9-4"	9-4"	
	N-40	8-1"	8-7"	9-0"	9-6"	10-1"	10-7"	11-2"	11-6"	12-0"	12-5"	12-5"	
	N-60	8-3"	8-9"	9-8"	10-1"	10-6"	11-1"	11-6"	12-0"	12-3"	13-0"	13-0"	
	N-70	8-3"	9-1"	9-9"	10-1"	10-6"	11-1"	11-6"	12-0"	12-3"	13-0"	13-0"	
	N-80	9-0"	9-3"	9-9"	10-1"	10-6"	11-1"	11-6"	12-0"	12-3"	12-6"	12-6"	
16"	N-20	8-9"	9-2"	10-0"	10-6"	11-2"	11-7"	12-1"	12-5"	12-7"	12-11"	12-11"	
	N-40	9-4"	9-9"	10-5"	11-2"	11-7"	12-1"	12-5"	12-7"	12-7"	12-11"	12-11"	
	N-60	10-3"	10-8"	11-2"	11-6"	12-1"	12-6"	12-9"	13-2"	14-1"	14-1"	14-1"	
	N-70	10-3"	10-8"	11-2"	11-6"	12-1"	12-6"	12-9"	13-2"	14-1"	14-1"	14-1"	
	N-80	10-4"	10-9"	11-3"	11-9"	12-1"	12-7"	13-1"	13-6"	14-2"	14-4"	14-4"	





Refer to the Installation Guide for Residential Floors for additional information.  
CCMC EVALUATION REPORT 13032-R

## WEB HOLE SPECIFICATIONS

RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

- The distance between the inside edge of the support and the centreline of any hole or duct chase opening shall be in compliance with the requirements of Table 1 or 2, respectively.
- I-joist top and bottom flanges must NEVER be cut, notched, or otherwise modified.
- Whenever possible, field-cut holes should be centred on the middle of the web.
- The maximum size hole or the maximum depth of a duct chase opening that can be cut into an I-joist web shall equal the clear distance between the flanges of the I-joist minus 1/4 inch. A minimum of 1/8 inch should always be maintained between the top or bottom of the hole or opening and the adjacent I-joist flange.

- The sides of square holes or longest sides of rectangular holes should not exceed 3/4 of the diameter of the maximum round hole permitted at that location.
- Where more than one hole is necessary, the distance between adjacent hole edges shall exceed twice the diameter of the largest round hole or twice the size of the largest square hole (or twice the length of the longest side of the longest rectangular hole or duct chase opening) and each hole and duct chase opening shall be sized and located in compliance with the requirements of Tables 1 and 2, respectively.
- A knockout is not considered a hole, may be utilized anywhere it occurs, and may be ignored for purposes of calculating minimum distances between holes and/or duct chase openings.
- Holes measuring 1-1/2 inches or smaller are permitted anywhere in a cantilevered section of a joist. Holes of greater size may be permitted subject to verification.

- A 1-1/2 inch hole or smaller can be placed anywhere in the web provided that it meets the requirements of rule number 6 above.
- All holes and duct chase openings shall be cut in a workman-like manner in accordance with the restrictions listed above and as illustrated in Figure 7.
- Limit three maximum size holes per span, of which one may be a duct chase opening.
- A group of round holes at approximately the same location shall be permitted if they meet the requirements for a single round hole circumscribed around them.

TABLE 1  
**LOCATION OF CIRCULAR HOLES IN JOIST WEBS**  
Simple or Multiple Span for Dead Loads up to 15 psf and Live Loads up to 40 psf

Joist Depth	Joist Series	Minimum Distance from Inside Face of Any Support to Centre of Hole (ft - in.)											
		Round Hole Diameter (in.)											
		2	3	4	5	6	6-1/4	7	8	8-5/8	9	10	10-3/4
9-1/2"	NI-20	0'-7"	1'-6"	2'-10"	4'-3"	5'-8"	6'-0"	---	---	---	---	---	---
	NI-40x	0'-7"	1'-6"	3'-0"	4'-4"	6'-0"	6'-4"	---	---	---	---	---	---
	NI-60	1'-3"	2'-6"	4'-0"	5'-4"	7'-0"	7'-5"	---	---	---	---	---	---
	NI-70	2'-0"	3'-4"	4'-9"	6'-3"	8'-0"	8'-4"	---	---	---	---	---	---
	NI-80	2'-3"	3'-6"	5'-0"	6'-6"	8'-2"	8'-8"	---	---	---	---	---	---
11-7/8"	NI-20	0'-7"	0'-8"	1'-0"	2'-4"	3'-8"	4'-0"	5'-0"	6'-6"	7'-9"	---	---	---
	NI-40x	0'-7"	0'-8"	1'-3"	2'-8"	4'-0"	4'-4"	5'-5"	7'-0"	8'-4"	---	---	---
	NI-60	0'-7"	1'-8"	3'-0"	4'-3"	5'-9"	6'-0"	7'-3"	8'-10"	10'-0"	---	---	---
	NI-70	1'-3"	2'-6"	4'-0"	5'-4"	6'-9"	7'-2"	8'-4"	10'-0"	11'-2"	---	---	---
	NI-80	1'-6"	2'-10"	4'-2"	5'-6"	7'-0"	7'-5"	8'-6"	10'-3"	11'-4"	---	---	---
14"	NI-20	0'-7"	0'-8"	1'-5"	3'-2"	4'-10"	5'-4"	6'-9"	8'-9"	10'-2"	---	---	---
	NI-40x	0'-7"	0'-8"	0'-9"	2'-5"	4'-4"	4'-9"	6'-3"	---	---	---	---	---
	NI-60	0'-7"	0'-8"	1'-8"	3'-0"	4'-3"	4'-8"	5'-8"	7'-2"	8'-0"	8'-8"	10'-4"	11'-9"
	NI-70	0'-8"	1'-10"	3'-0"	4'-5"	5'-10"	6'-2"	7'-3"	8'-9"	9'-9"	10'-4"	12'-0"	13'-5"
	NI-80	0'-10"	2'-0"	3'-4"	4'-9"	6'-2"	6'-5"	7'-6"	9'-0"	10'-0"	10'-8"	12'-4"	13'-9"
16"	NI-20	0'-7"	0'-8"	1'-5"	3'-2"	4'-10"	5'-4"	6'-9"	8'-9"	10'-2"	---	---	---
	NI-40x	0'-7"	0'-8"	0'-9"	2'-5"	4'-4"	4'-9"	6'-3"	---	---	---	---	---
	NI-60	0'-7"	0'-8"	1'-8"	3'-0"	4'-3"	4'-8"	5'-8"	7'-2"	8'-0"	8'-8"	10'-4"	11'-9"
	NI-70	0'-8"	1'-10"	3'-0"	4'-5"	5'-10"	6'-2"	7'-3"	8'-9"	9'-9"	10'-4"	12'-0"	13'-5"
	NI-80	0'-10"	2'-0"	3'-4"	4'-9"	6'-2"	6'-5"	7'-6"	9'-0"	10'-0"	10'-8"	12'-4"	13'-9"

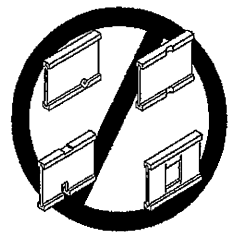
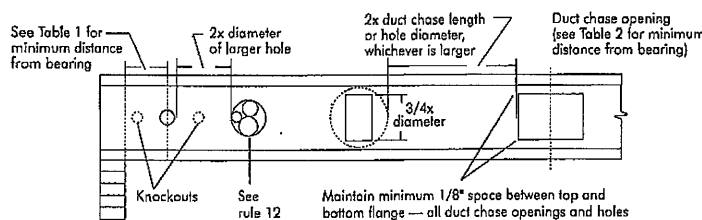
- Above table may be used for I-joist spacing of 24 inches on centre or less.
- Hole location distance is measured from inside face of supports to centre of hole.
- Distances in this chart are based on uniformly loaded joists.
- The above table is based on the I-joists being used at their maximum spans. The minimum distance as given above may be reduced for shorter spans; contact your local distributor.

TABLE 2  
**DUCT CHASE OPENING SIZES AND LOCATIONS**  
Simple Span Only

Joist Depth	Joist Series	Minimum distance from inside face of supports to centre of opening (ft - in.)											
		Duct Chase Length (in.)											
		8	10	12	14	16	18	20	22	24			
9-1/2"	NI-20	4'-1"	4'-5"	4'-10"	5'-4"	5'-8"	6'-1"	6'-6"	7'-1"	7'-5"	---	---	---
	NI-40x	5'-3"	5'-7"	6'-0"	6'-5"	6'-10"	7'-3"	7'-8"	8'-2"	8'-6"	---	---	---
	NI-60	5'-4"	5'-9"	6'-2"	6'-7"	7'-1"	7'-5"	8'-0"	8'-3"	8'-9"	---	---	---
	NI-70	5'-1"	5'-5"	5'-10"	6'-3"	6'-7"	7'-1"	7'-6"	8'-1"	8'-4"	---	---	---
	NI-80	5'-3"	5'-8"	6'-0"	6'-5"	6'-10"	7'-3"	7'-8"	8'-2"	8'-6"	---	---	---
11-7/8"	NI-20	5'-9"	6'-2"	6'-6"	7'-1"	7'-5"	7'-9"	8'-3"	8'-9"	9'-4"	---	---	---
	NI-40x	6'-8"	7'-2"	7'-6"	8'-1"	8'-6"	9'-1"	9'-6"	10'-1"	10'-9"	---	---	---
	NI-60	7'-3"	7'-7"	8'-1"	8'-6"	9'-0"	9'-5"	9'-9"	10'-3"	11'-0"	---	---	---
	NI-70	7'-1"	7'-4"	7'-9"	8'-3"	8'-7"	9'-1"	9'-6"	10'-1"	10'-4"	---	---	---
	NI-80	7'-2"	7'-7"	8'-0"	8'-5"	8'-10"	9'-3"	9'-8"	10'-2"	10'-8"	---	---	---
14"	NI-20	7'-6"	7'-11"	8'-4"	8'-9"	9'-2"	9'-7"	10'-1"	10'-7"	10'-11"	---	---	---
	NI-40x	8'-1"	8'-1"	8'-5"	8'-10"	9'-4"	9'-8"	10'-2"	10'-8"	11'-2"	---	---	---
	NI-60	8'-1"	8'-7"	9'-0"	9'-6"	10'-1"	10'-7"	11'-2"	11'-8"	12'-3"	---	---	---
	NI-70	8'-9"	9'-3"	9'-8"	10'-1"	10'-6"	11'-1"	11'-6"	12'-1"	12'-6"	---	---	---
	NI-80	9'-0"	9'-3"	9'-9"	10'-1"	10'-7"	11'-1"	11'-6"	12'-1"	12'-6"	---	---	---
16"	NI-20	9'-2"	9'-6"	10'-0"	10'-6"	10'-11"	11'-5"	11'-9"	12'-4"	12'-11"	---	---	---
	NI-40x	9'-4"	9'-9"	10'-3"	10'-7"	11'-1"	11'-7"	12'-1"	12'-7"	13'-2"	---	---	---
	NI-60	10'-3"	10'-8"	11'-2"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-1"	---	---	---
	NI-70	10'-1"	10'-5"	11'-0"	11'-4"	11'-10"	12'-3"	12'-8"	13'-3"	14'-0"	---	---	---
	NI-80	10'-4"	10'-9"	11'-3"	11'-8"	12'-2"	12'-7"	13'-1"	13'-6"	14'-1"	---	---	---

- Above table may be used for I-joist spacing of 24 inches on centre or less.
- Duct chase opening location distance is measured from inside face of supports to centre of opening.
- The above table is based on simple-span joists only. For other applications, contact your local distributor.
- Distances are based on uniformly loaded floor joists that meet the span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480.
- The above table is based on the I-joists being used at their maximum spans. The minimum distance as given above may be reduced for shorter spans; contact your local distributor.

FIGURE 7  
**FIELD-CUT HOLE LOCATOR**



Knockouts are pre-scored holes provided for the contractor's convenience to install electrical or small plumbing lines. They are 1-1/2 inches in diameter, and are spaced 15 inches on centre along the length of the I-joist. Where possible, it is preferable to use knockouts instead of field-cut holes.

Never drill, cut or notch the flange, or over-cut the web.

Holes in webs should be cut with a sharp saw.

For rectangular holes, avoid over-cutting the corners, as this can cause unnecessary stress concentrations. Slightly rounding the corners is recommended. Starting the rectangular hole by drilling a 1-inch diameter hole in each of the four corners and then making the cuts between the holes is another good method to minimize damage to the I-joist.

## SAFETY AND CONSTRUCTION PRECAUTIONS



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



Never stack building materials over unshored I-joists. Once sheathed, do not over-stress I-joists with concentrated loads from building materials.

WARNING: 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:

- Brace and nail each I-joist as it is installed, using hangers, blocking panels, rim board, and/or cross-bracing 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.
- 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" 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.
- For cantilevered I-joists, brace top and bottom flanges, and brace ends with closure panels, rim board, or cross-bracing.
- 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.
- 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 conditions. Follow these installation guidelines carefully.



## PRODUCT WARRANTY

Chantiers Chibougamau guarantees that, in accordance with our specifications, Nordic products are free from manufacturing defects in material and workmanship.

Furthermore, Chantiers Chibougamau warrants that our products, when utilized in accordance with our handling and installation instructions, will meet or exceed our specifications for the lifetime of the structure.

**1a** NI blocking panel

Blocking Panel or Rim Joist  
NI Joists

Maximum Factored Uniform Vertical Load\* (plf)  
3,300

\*The uniform vertical load is limited to a joist depth of 16 inches or less and is based on standard term load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer, see detail 1d.

Attach I-joist to top plate per detail 1b

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 decking)

**1d** NI or rim board blocking panel per detail 1a

Pair of Squash Blocks

Maximum Factored Vertical Load per Pair of Squash Blocks (lbs)

2x Lumber	5,500	8,500
1-1/8" Rim Board Plus	4,300	6,600

Provide lateral bracing per detail 1a or 1b

**1h** Backer block (use if hanger load exceeds 360 lbs). 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 tight to top flange. Use twelve 3" nails, clinched when possible. Maximum factored resistance for hanger for this detail = 1,620 lbs.

BACKER BLOCKS (Blocks must be long enough to permit required nailing without splitting)

Flange Width	Material Thickness Required*	Minimum Depth**
2-1/2"	1"	5-1/2"
3-1/2"	1-1/2"	7-1/4"

\* 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 or CAN/CSA-Q437 Standard.  
\*\* For face-mount hangers use net joist depth minus 3-1/4" for joists with 1-1/2" thick flanges. For 2" thick flanges use net depth minus 4-1/4".

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

NOTE: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

Top-mount hanger installed per manufacturer's recommendations

**1m** Multiple I-joist header with full depth filler block shown. Nordic Lam or SCL headers may also be used. Verify double I-joist capacity to support concentrated loads.

Backer block attached per detail 1h. Nail with twelve 3" nails, clinch when possible.

Install hanger per manufacturer's recommendations

Maximum support capacity = 1,620 lbs.

**1p** FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION

Filler block

Offset nails from opposite face by 6"

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

NOTES:

- Support back of I-joist web during nailing to prevent damage to web/flange connection.
- Leave a 1/8 to 1/4-inch gap between top of filler block and bottom of top I-joist flange.
- Filler block is required between joists for full length of span.
- Nail joists together with two rows of 3" nails at 12 inches o.c. (clinched when possible) on each side of the double I-joist. Total of four nails per foot required. If nails can be clinched, only two nails per foot are required.
- The maximum factored load that may be applied to one side of the double joist using this detail is 860 lb/ft. Verify double I-joist capacity.

**1b** Rim board

Blocking Panel or Rim Joist  
1-1/8" Rim Board Plus

Maximum Factored Uniform Vertical Load\* (plf)  
8,090

\*The uniform vertical load is limited to a rim board depth of 16 inches or less and is based on standard term load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer, see detail 1d.

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

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

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

Minimum bearing length shall be 1-3/4" for the end bearings, and 3-1/2" for the intermediate bearings when applicable.

**1e** Transfer load from above to bearing below. Install squash blocks per detail 1d. Match bearing area of blocks below to post above.

**1g** Joist attachment per detail 1b

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

Blocking required over all interior supports under load-bearing walls or when floor joists are not continuous over support

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

NI blocking panel per detail 1a

**1i** Nordic Lam or Structural Composite Lumber (SCL)

For nailing schedules for multiple beams, see the manufacturer's recommendations.

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

NOTE: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

**1n** Do not bevel-cut joist beyond inside face of wall

Attach I-joist per detail 1b

NOTE: Blocking required at bearing for lateral support, not shown for clarity.

**1r** Lumber 2x4 min., extend block to face of adjacent web. Two 2-1/2" spiral nails from each web to lumber piece, alternate on opposite side.

NI blocking panel

OPTIONAL: Minimum 1x4 inch strap applied to underside of joist at blocking line or 1/2 inch minimum gypsum ceiling attached to underside of joists.

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

2x4 min. (1/8" gap minimum)

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

One 2-1/2" nail one side only

NOTES:

- In some local codes, blocking is prescriptively required in the first joist space (or first and second joist space) next to the starter joist. Where required, see local code requirements for spacing of the blocking.
- All nails are common spiral in this detail.

All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for clarity.

## WEB STIFFENERS

RECOMMENDATIONS:

- A bearing stiffener is required in all engineered applications with factored reactions greater than shown in the I-joist properties table found in the I-joist Construction Guide (C101). The gap between the stiffener and the flange is at the top.
- A bearing stiffener is required when the I-joist is supported in a hanger and the sides of the hanger do not extend up to, and support, the top flange. The gap between the stiffener and flange is at the top.
- A load stiffener is required at locations where a factored concentrated load greater than 2,370 lbs is applied to the top flange between supports, or in the case of a cantilever, anywhere between the cantilever tip and the support. These values are for standard term load duration, and may be adjusted for other load durations as permitted by the code. The gap between the stiffener and the flange is at the bottom.

FIGURE 2  
**WEB STIFFENER INSTALLATION DETAILS**

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

Approx. 2" I

1/8"-1/4" Gap

(4) 2-1/2" nails, 3" nails required for I-joists with 3-1/2" flange width

No Gap

CONCENTRATED LOAD (Load stiffener)

Tight Joint No Gap

END BEARING (Bearing stiffener)

Gap

Tight Joint No Gap

STIFFENER SIZE REQUIREMENTS

Flange Width	Web Stiffener Size Each Side of Web
2-1/2"	1" x 2-5/16" minimum width
3-1/2"	1-1/2" x 2-5/16" minimum width

## CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET

**4a** Method 1 — SHEATHING REINFORCEMENT ONE SIDE

Rim board or wood structural panel closure (3/4" minimum thickness); attach per detail 1b

NI blocking panel or rim board blocking, attach per detail 1g

Attach I-joist to plate per detail 1b

2-1/2" nails

3-1/2" min. bearing required

Method 2 — SHEATHING REINFORCEMENT TWO SIDES

Use same installation as Method 1 but reinforce both sides of I-joist with sheathing.

Use nailing pattern shown for Method 1 with opposite face nailing offset by 3".

NOTE: Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4") required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2" nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail 1b. Verify reinforced I-joist capacity.

## RIM BOARD INSTALLATION DETAILS

**8a** ATTACHMENT DETAILS WHERE RIM BOARDS ABUT

Rim Board Joint Between Floor Joists

(1) 2-1/2" nail top and bottom (typical)

Rim board joint

Rim Board Joint at Corner

Rim board joint

2-1/2" toe-nails at 6" o.c. (typical)

1-1/2" nails

1-1/2"

**8b** TOE-NAIL CONNECTION AT RIM BOARD

Rim board

30°

1/3

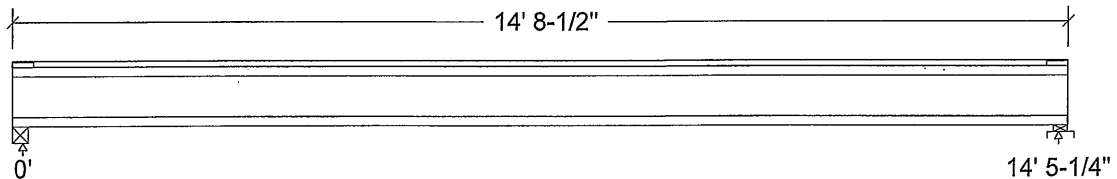
## Design Check Calculation Sheet

Nordic Sizer – Canada 7.2

### Loads:

Load	Type	Distribution	Pat-tern	Location [ft] Start End	Magnitude Start End	Unit
Load1	Dead	Full Area			20.00	psf
Load2	Live	Full Area			40.00	psf

### Maximum Reactions (lbs) and Support Bearing (in):



Unfactored:			
Dead	192		192
Live	385		385
Factored:			
Total	818		818
Bearing:			
Capacity			
Joist	1869		1865
Support	-		3981
Des ratio			
Joist	0.44		0.44
Support	-		0.21
Load case	#2		#2
Length	2-5/8		2-3/8
Min req'd	1-3/4		1-3/4
Stiffener	No		No
KD	1.00		1.00
KB support	-		1.00
fcpsup	-		769
Kzcp sup	-		1.09

### Nordic 9-1/2" NI-40x Floor joist @ 16" o.c.

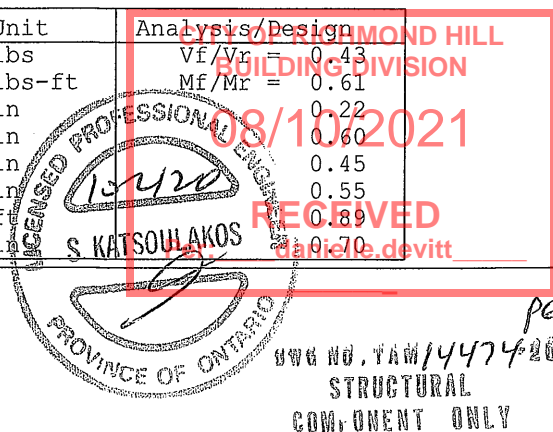
Supports: 1 - Steel Beam, W; 2 - Lumber Sill plate, No.1/No.2;

Total length: 14' 8-1/2"; Clear span: 14' 3-1/2"; 3/4" nailed and glued OSB sheathing

**This section PASSES the design code check.**

### Limit States Design: Using CAN O86-14 and Vibration Criterion:

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	Vf = 818	Vr = 1895	lbs	Vf/Vr = 0.43
Moment(+)	Mf = 2953	Mr = 4824	lbs-ft	Mf/Mr = 0.61
Perm. Defl'n	0.11 = < L/999	0.48 = L/360	in	0.22
Live Defl'n	0.22 = L/801	0.36 = L/480	in	0.60
Total Defl'n	0.32 = L/534	0.72 = L/240	in	0.45
Bare Defl'n	0.27 = L/651	0.48 = L/360	in	0.55
Vibration	Lmax = 14'-5.3	Lv = 16'-2.1	ft	0.89
Defl'n	= 0.032	= 0.046	in	0.70





**Additional Data:**

FACTORS:	f/E	KD	KH	KZ	KL	KT	KS	KN	LC#
Vr	1895	1.00	1.00	-	-	-	-	-	#2
Mr+	4824	1.00	1.00	-	1.000	-	-	-	#2
EI	218.1 million	-	-	-	-	-	-	-	#2

**CRITICAL LOAD COMBINATIONS:**

Shear : LC #2 = 1.25D + 1.5L

Moment(+) : LC #2 = 1.25D + 1.5L

Deflection: LC #1 = 1.0D (permanent)

LC #2 = 1.0D + 1.0L (live)

LC #2 = 1.0D + 1.0L (total)

LC #2 = 1.0D + 1.0L (bare joist)

Bearing : Support 1 - LC #2 = 1.25D + 1.5L

Support 2 - LC #2 = 1.25D + 1.5L

Load Types: D=dead W=wind S=snow H=earth,groundwater E=earthquake

L=live(use,occupancy) Ls=live(storage,equipment) f=fire

Load Patterns: s=S/2 L=L+Ls \_=no pattern load in this span

All Load Combinations (LCs) are listed in the Analysis output

**CALCULATIONS:**E<sub>I</sub>eff = 275.77 lb-in<sup>2</sup> K= 4.94e06 lbs

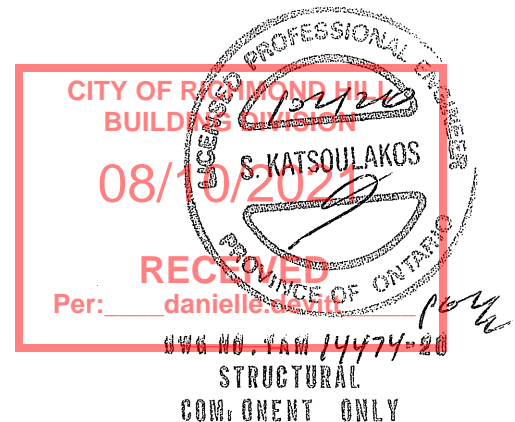
"Live" deflection is due to all non-dead loads (live, wind, snow...)

CONFORMS TO OBC 2012

AMENDED 2020

**Design Notes:**

1. WoodWorks analysis and design are in accordance with the 2015 National Building Code of Canada (NBC), Division B, Part 4, and the CSA O86-14 Engineering Design in Wood standard, Update No. 2 (June 2017).
2. Please verify that the default deflection limits are appropriate for your application.
3. Refer to Nordic Structures technical documentation for installation guidelines and construction details.
4. Nordic I-joists are listed in CCMC evaluation report 13032-R.
5. Joists shall be laterally supported at supports and continuously along the compression edge.
6. The design assumptions and specifications have been provided by the client. Any damages resulting from faulty or incorrect information, specifications, and/or designs furnished, and the correctness or accuracy of this information is their responsibility. This analysis does not constitute a record of the structural integrity of the building nor suitability of the design assumptions made. Nordic Structures is responsible only for the structural adequacy of this component based on the design criteria and loadings shown.



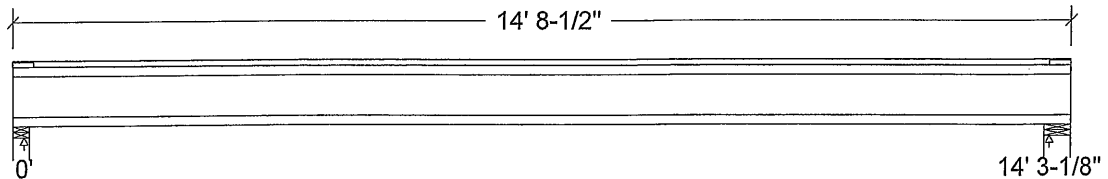
## Design Check Calculation Sheet

Nordic Sizer – Canada 7.2

### Loads:

Load	Type	Distribution	Pat-tern	Location [ft] Start End	Magnitude Start End	Unit
Load1	Dead	Full Area			20.00	psf
Load2	Live	Full Area			40.00	psf

### Maximum Reactions (lbs) and Support Bearing (in):



Unfactored:			
Dead	190		190
Live	380		380
Factored:			
Total	808		808
Bearing:			
Capacity			
Joist	1872		1893
Support	4756		7744
Des ratio			
Joist	0.43		0.43
Support	0.17		0.10
Load case	#2		#2
Length	2-3/4		4-3/8
Min req'd	1-3/4		1-3/4
Stiffener	No		No
KD	1.00		1.00
KB support	-		-
fcp sup	769		769
Kzcp sup	-		-

Bearing for wall supports is perpendicular-to-grain bearing on top plate. No stud design included.

### Nordic 9-1/2" NI-40x Floor joist @ 16" o.c.

Supports: All - Lumber Wall, No.1/No.2

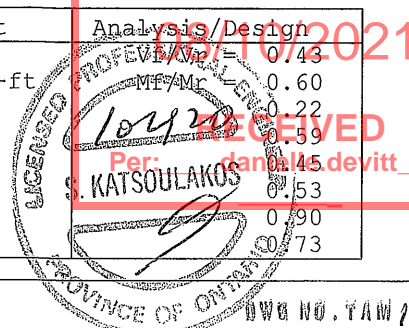
Total length: 14' 8-1/2"; Clear span: 14' 1-3/8"; 5/8" nailed and glued OSB sheathing with 1/2" gypsum ceiling

This section **PASSES** the design code check.

### Limit States Design using CSA O86-14 and Vibration Criterion:

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	Vf = 808	Vr = 1895	lbs	0.43
Moment(+)	Mf = 2881	Mr = 4824	lbs-ft	0.60
Perm. Defl'n	0.11 = < L/999	0.48 = L/360	in	0.22
Live Defl'n	0.21 = L/808	0.36 = L/480	in	0.59
Total Defl'n	0.32 = L/538	0.71 = L/240	in	0.53
Bare Defl'n	0.25 = L/674	0.48 = L/360	in	0.90
Vibration	Lmax = 14'-3.1	Lv = 15'-9.3	ft	0.73
Defl'n	= 0.034	= 0.047	in	

CITY OF RICHMOND HILL  
BUILDING DIVISION



NO. 14475-20  
STRUCTURAL  
CONCRETE DIV

**Additional Data:**

FACTORS:	f/E	KD	KH	KZ	KL	KT	KS	KN	LC#
Vr	1895	1.00	1.00	-	-	-	-	-	#2
Mr+	4824	1.00	1.00	-	1.000	-	-	-	#2
EI	218.1 million	-	-	-	-	-	-	-	#2

**CRITICAL LOAD COMBINATIONS:**

Shear : LC #2 = 1.25D + 1.5L

Moment(+) : LC #2 = 1.25D + 1.5L

Deflection: LC #1 = 1.0D (permanent)

LC #2 = 1.0D + 1.0L (live)

LC #2 = 1.0D + 1.0L (total)

LC #2 = 1.0D + 1.0L (bare joist)

Bearing : Support 1 - LC #2 = 1.25D + 1.5L

Support 2 - LC #2 = 1.25D + 1.5L

Load Types: D=dead W=wind S=snow H=earth,groundwater E=earthquake  
L=live(use,occupancy) Ls=live(storage,equipment) f=fire

Load Patterns: s=S/2 L=L+Ls \_=no pattern load in this span

All Load Combinations (LCs) are listed in the Analysis output

**CALCULATIONS:**E<sub>I</sub>eff = 267.73 lb-in<sup>2</sup> K= 4.94e06 lbs

"Live" deflection is due to all non-dead loads (live, wind, snow...)

CONFORMS TO OBC 2012

AMENDED 2020

**Design Notes:**

1. WoodWorks analysis and design are in accordance with the 2015 National Building Code of Canada (NBC), Division B, Part 4, and the CSA O86-14 Engineering Design in Wood standard, Update No. 2 (June 2017).
2. Please verify that the default deflection limits are appropriate for your application.
3. Refer to Nordic Structures technical documentation for installation guidelines and construction details.
4. Nordic I-joists are listed in CCMC evaluation report 13032-R.
5. Joists shall be laterally supported at supports and continuously along the compression edge.
6. The design assumptions and specifications have been provided by the client. Any damages resulting from faulty or incorrect information, specifications, and/or designs furnished, and the correctness or accuracy of this information is their responsibility. This analysis does not constitute a record of the structural integrity of the building nor suitability of the design assumptions made. Nordic Structures is responsible only for the structural adequacy of this component based on the design criteria and loadings shown.





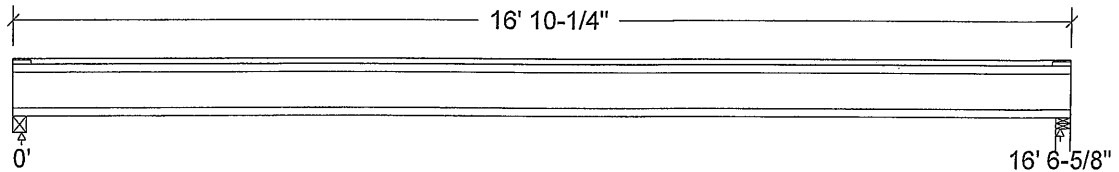
## Design Check Calculation Sheet

Nordic Sizer – Canada 7.2

### Loads:

Load	Type	Distribution	Pat- tern	Location [ft] Start End	Magnitude Start End	Unit
Load1	Dead	Full Area			20.00	psf
Load2	Live	Full Area			40.00	psf

### Maximum Reactions (lbs) and Support Bearing (in):



Unfactored:			
Dead	166		166
Live	331		331
Factored:			
Total	703		703
Bearing:			
Capacity			
Joist	1893		1893
Support	-		6659
Des ratio			
Joist	0.37		0.37
Support	-		0.11
Load case	#2		#2
Length	2-5/8		2-3/4
Min req'd	1-3/4		1-3/4
Stiffener	No		No
KD	1.00		1.00
KB support	-		-
fcp sup	-		769
Kzcp sup	-		-

Bearing for wall supports is perpendicular-to-grain bearing on top plate. No stud design included.

### Nordic 9-1/2" NI-80 Floor joist @ 12" o.c.

Supports: 1 - Steel Beam, W; 2 - Lumber Wall, No.1/No.2;

Total length: 16' 10-1/4"; Clear span: 16' 4-7/8"; 5/8" nailed and glued OSB sheathing

This section **PASSES** the design code check.

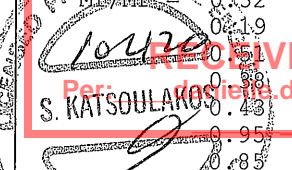
### Limit States Design using CSA O86-14 and Vibration Criterion:

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	Vf = 703	Vr = 1895	lbs	Vf/Vr = 0.37
Moment (+)	Mf = 2911	Mr = 8958	lbs-ft	Mf/Mr = 0.32
Perm. Defl'n	0.11 = < L/999	0.55 = L/360	in	0.19
Live Defl'n	0.21 = L/943	0.41 = L/480	in	0.50
Total Defl'n	0.32 = L/628	0.83 = L/240	in	0.38
Bare Defl'n	0.24 = L/844	0.55 = L/360	in	0.43
Vibration	Lmax = 16'-6.6	Lv = 17'-5	ft	0.95
Defl'n	= 0.033	= 0.038	in	0.85

**CITY OF RICHMOND HILL  
BUILDING DIVISION**

08/10/2021

**RECEIVED**  
Per: S. KATSOULAKOS  
s.katsoulakos@richmondhill.ca



NO. TAM 14426-20  
STRUCTURAL  
COMPONENT ONLY

**Additional Data:**

FACTORS:	f/E	KD	KH	KZ	KL	KT	KS	KN	LC#
Vr	1895	1.00	1.00	-	-	-	-	-	#2
Mr+	8958	1.00	1.00	-	1.000	-	-	-	#2
EI	324.1 million	-	-	-	-	-	-	-	#2

**CRITICAL LOAD COMBINATIONS:**

Shear : LC #2 = 1.25D + 1.5L

Moment(+) : LC #2 = 1.25D + 1.5L

Deflection: LC #1 = 1.0D (permanent)

LC #2 = 1.0D + 1.0L (live)

LC #2 = 1.0D + 1.0L (total)

LC #2 = 1.0D + 1.0L (bare joist)

Bearing : Support 1 - LC #2 = 1.25D + 1.5L

Support 2 - LC #2 = 1.25D + 1.5L

Load Types: D=dead W=wind S=snow H=earth,groundwater E=earthquake

L=live(use,occupancy) Ls=live(storage,equipment) f=fire

Load Patterns: s=S/2 L=L+Ls \_=no pattern load in this span

All Load Combinations (LCs) are listed in the Analysis output

**CALCULATIONS:**E<sub>ieff</sub> = 367.27 lb-in<sup>2</sup> K= 4.94e06 lbs

"Live" deflection is due to all non-dead loads (live, wind, snow...)

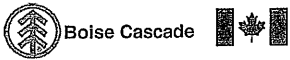
CONFORMS TO NBC 2012

**Design Notes:**

AMENDED 2020

1. WoodWorks analysis and design are in accordance with the 2015 National Building Code of Canada (NBC), Division B, Part 4, and the CSA O86-14 Engineering Design in Wood standard, Update No. 2 (June 2017).
2. Please verify that the default deflection limits are appropriate for your application.
3. Refer to Nordic Structures technical documentation for installation guidelines and construction details.
4. Nordic I-joists are listed in CCMC evaluation report 13032-R.
5. Joists shall be laterally supported at supports and continuously along the compression edge.
6. The design assumptions and specifications have been provided by the client. Any damages resulting from faulty or incorrect information, specifications, and/or designs furnished, and the correctness or accuracy of this information is their responsibility. This analysis does not constitute a record of the structural integrity of the building nor suitability of the design assumptions made. Nordic Structures is responsible only for the structural adequacy of this component based on the design criteria and loadings shown.





**Triple 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP**  
**2ND FLR FRAMING\Flush Beams\B14(i2340) (Flush Beam)**

**PASSED**

BC CALC® Member Report

Dry | 1 span | No cant.

October 20, 2020 11:03:21

Build 0

Job name:

File name: 38-9.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B14(i2340)

City, Province, Postal Code: RICHMOND HILL

Specifier:

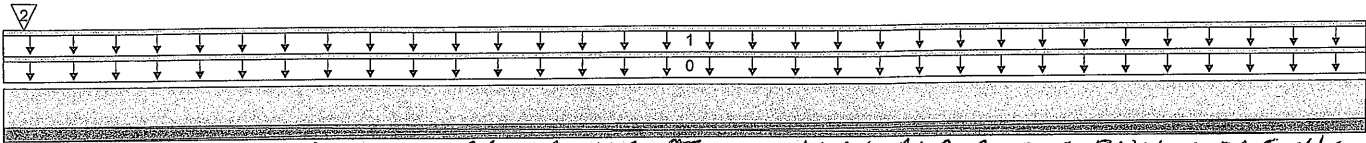
Customer:

Designer: LBV

Code reports:

CCMC 12472-R

Company:



Total Horizontal Product Length = 15-05-12

**Load Summary**

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	15-05-12	Top		14			00-00-00
1	E35(i976)	Unf. Lin. (lb/ft)	L	00-00-00	15-05-12	Top		82			n/a
2	E35(i976)	Conc. Pt. (lbs)	L	00-02-12	00-02-12	Top		13	30		n/a

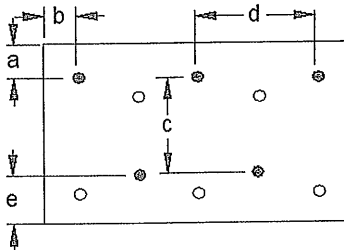
**Controls Summary**

	Factored Demand	Factored Resistance	Demand/ Resistance	Case	Location
Dist. Load	114.10 lb/ft	56203.87 lb/ft	0.2%		
Conc. Load	61 lbs	25220 lbs	0.2%		

CONFORMS TO OBC 2012

**Connection Diagram: Full Length of Member**

AMENDED 2020



4 rows

a minimum = 3"  
b minimum = 3"

c = 6-1/2"  
d = 5-2"  
e minimum = 3"

Nailing applies to both sides of the member

Connectors are: 3-1/2" ARDOX SPIRAL Nails



DWG NO. YAW 14477-20  
**STRUCTURAL  
COMPONENT ONLY**

**Disclosure**

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

Per: [Signature]

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,



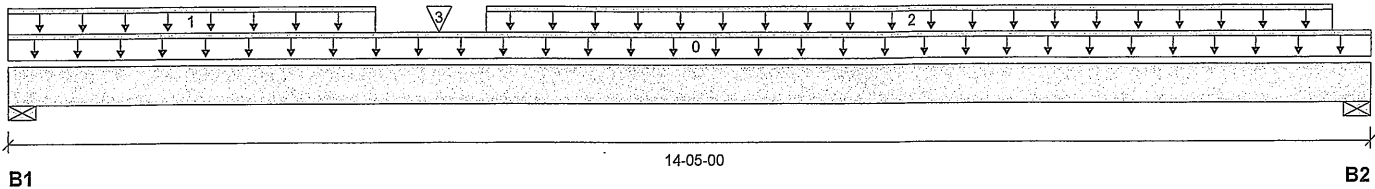
BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 8, 2020 09:59:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9.mmdl  
Description: 2ND FLR FRAMING/Dropped Beams/B9(i1722)  
Specifier:  
Designer: LBV  
Company:



Total Horizontal Product Length = 14-05-00

### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 5-1/2"	4222 / 0	2238 / 0		
B2, 5-1/2"	4028 / 0	2141 / 0		

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	14-05-00	Top		18			00-00-00
1	Smoothed Load	Unf. Lin. (lb/ft)	L	00-00-00	03-10-00	Top	597	298			n/a
2	Smoothed Load	Unf. Lin. (lb/ft)	L	05-00-00	14-00-00	Top	583	291			n/a
3	-	Conc. Pt. (lbs)	L	04-06-00	04-06-00	Top	716	358			n/a

### Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	28601 ft-lbs	55212 ft-lbs	51.8%	1	07-02-00
End Shear	7541 lbs	21696 lbs	34.8%	1	12-11-10
Total Load Deflection	L/356 (0.46")	n/a	67.5%	4	07-02-00
Live Load Deflection	L/545 (0.3")	n/a	66.1%	5	07-02-00
Max Defl.	0.46"	n/a	n/a	4	07-02-00
Span / Depth	13.8				

### Bearing Supports

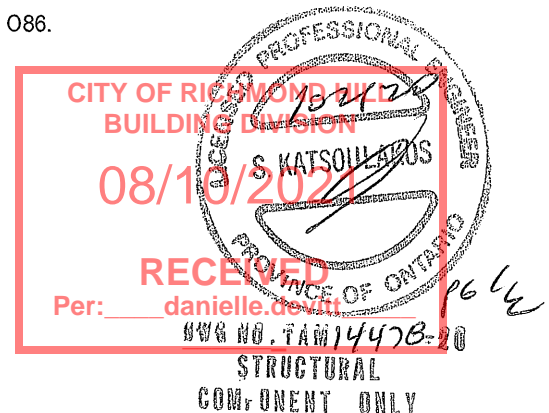
	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 5-1/2" x 5-1/4"	9131 lbs	23.7%	25.9%	Spruce-Pine-Fir
B2	Wall/Plate 5-1/2" x 5-1/4"	8718 lbs	22.6%	24.7%	Spruce-Pine-Fir

### Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
Design meets Code minimum (L/360) Live load deflection criteria.  
Calculations assume unbraced length of Top: 01-02-12, Bottom: 01-02-12.  
Resistance Factor phi has been applied to all presented results per CSA O86.  
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.  
Design based on Dry Service Condition.  
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020





Triple 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP  
2ND FLR FRAMING\Dropped Beams\B9(i1722) (Dropped Beam)

PASSED

BC CALC® Member Report  
Build 7493

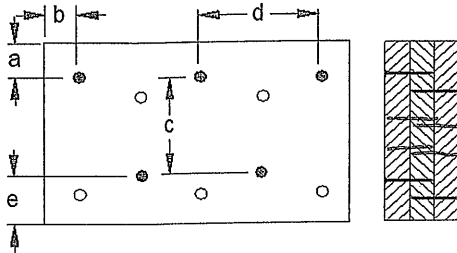
Dry | 1 span | No cant.

October 8, 2020 09:59:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9.mmdl  
Description: 2ND FLR FRAMING\Dropped Beams\B9(i1722)  
Specifier:  
Designer: LBV  
Company:

Connection Diagram: Full Length of Member



a minimum = 1"  
b minimum = 3"  
c = 8-7/8"  
d = 12"  
e minimum = 3"

Nailing applies to both sides of the member  
Connectors are: 1 3/4" Nails

3-1/2" ARDOX SPIRAL



OWN NO. YAM 1447B-20  
STRUCTURAL  
COMPONENT ONLY

Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

Per: [Signature]

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,

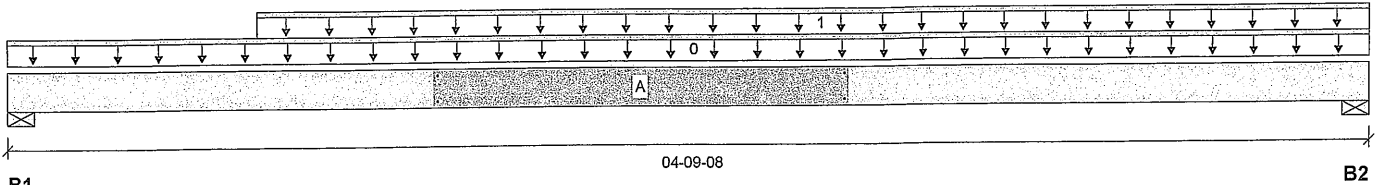
BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 8, 2020 09:59:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B10(i1712)  
Specifier:  
Designer: LBV  
Company:



Total Horizontal Product Length = 04-09-08

### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 5-1/2"	834 / 0	440 / 0		
B2, 5-1/2"	1455 / 0	749 / 0		

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	04-09-08	Top		10			00-00-00
1	Smoothed Load	Unf. Lin. (lb/ft)	L	00-10-08	04-09-08	Top	584	292			n/a

### Controls Summary

	Factored Demand	Factored Resistance	Demand/ Resistance	Case	Location
Pos. Moment	2255 ft-lbs	23220 ft-lbs	9.7%	1	02-10-08
End Shear	1786 lbs	11571 lbs	15.4%	1	01-03-00
Total Load Deflection	L/999 (0.009")	n/a	n/a	4	02-04-08
Live Load Deflection	L/999 (0.006")	n/a	n/a	5	02-04-08
Max Defl.	0.009"	n/a	n/a	4	02-04-08
Span / Depth	5.1				

Bearing Supports	Dim. (LxW)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B1	Wall/Plate 5-1/2" x 3-1/2"	1801 lbs	15.2%	7.7%	Spruce-Pine-Fir
B2	Wall/Plate 5-1/2" x 3-1/2"	3119 lbs	26.3%	13.3%	Spruce-Pine-Fir

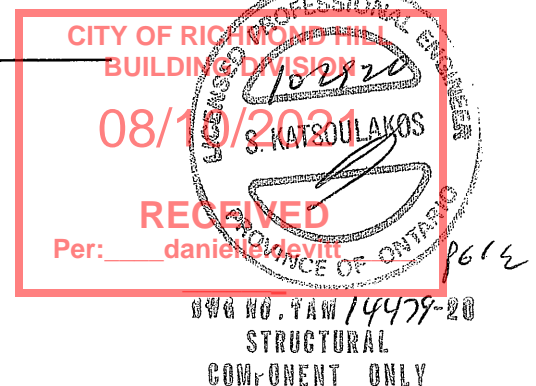
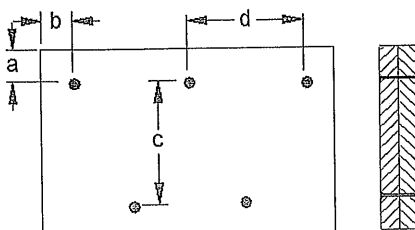
### Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
Design meets Code minimum (L/360) Live load deflection criteria.  
Calculations assume member is fully braced.  
Resistance Factor phi has been applied to all presented results per CSA O86.  
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.  
Design based on Dry Service Condition.  
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020

### Connection Diagram: Full Length of Member







# Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP

## 2ND FLR FRAMING\Flush Beams\B10(i1712) (Flush Beam)

PASSED

BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 8, 2020 09:59:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B10(i1712)  
Specifier:  
Designer: LBV  
Company:

### Connection Diagram: Full Length of Member

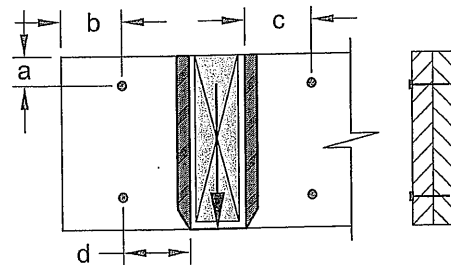
a minimum = 2" c = 5-1/2"  
b minimum = 3" d = 8"

Calculated Side Load = 412.3 lb/ft  
Connectors are: 16d Nails

3-1/2" ARDOX SPIRAL

### Connection Diagrams: Concentrated Side Loads

Connection Tag: A Applies to load tag(s): 1+2+4+3



a minimum = 2"  
b minimum = 4"  
c minimum = 4"  
d maximum = 12"  
Connectors are: 16d Nails

3-1/2" ARDOX SPIRAL



### Disclosure

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CITY OF RICHMOND HILL  
BUILDING DEPARTMENT  
08/10/2021  
Per:

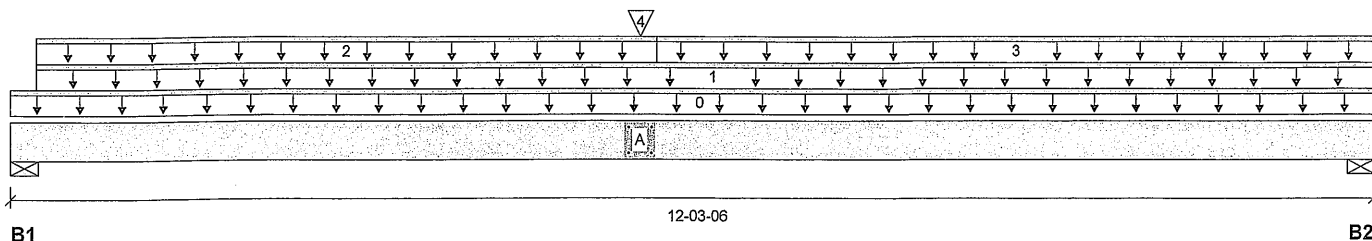
BC CALC®, BC FRAMER®, AJS™,  
ALLJOIST®, BC RIM BOARD™, BCI®,  
BOISE GLULAM™, BC FloorValue®,  
VERSA-LAM®, VERSA-RIM PLUS®

BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 8, 2020 09:59:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B11(i1760)  
Specifier:  
Designer: LBV  
Company:


Total Horizontal Product Length = 12-03-06

**Reaction Summary (Down / Uplift) (lbs)**

Bearing	Live	Dead	Snow	Wind
B1, 5-1/2"	960 / 0	579 / 0		
B2, 4-3/8"	791 / 0	486 / 0		

**Load Summary**

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	12-03-06	Top		10			00-00-00
1	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-02-12	12-03-06	Top	6	3			n/a
2	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-02-12	05-09-00	Top	7	4			n/a
3	FC2 Floor Material	Unf. Lin. (lb/ft)	L	05-09-00	12-03-06	Top	6	3			n/a
4	B13(i1486)	Conc. Pt. (lbs)	L	05-07-04	05-07-04	Top	1597	869			n/a

**Controls Summary**

	Factored Demand	Factored Resistance	Demand/ Resistance	Case	Location
Pos. Moment	10620 ft-lbs	23220 ft-lbs	45.7%	1	05-07-04
End Shear	2110 lbs	11571 lbs	18.2%	1	01-03-00
Total Load Deflection	L/471 (0.295")	n/a	50.9%	4	06-00-01
Live Load Deflection	L/746 (0.186")	n/a	48.2%	5	06-00-01
Max Defl.	0.295"	n/a	n/a	4	06-00-01
Span / Depth	14.6				

**Bearing Supports**

	Dim. (LxW)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B1	Wall/Plate 5-1/2" x 3-1/2"	2164 lbs	18.3%	9.2%	Spruce-Pine-Fir
B2	Wall/Plate 4-3/8" x 3-1/2"	1794 lbs	19.0%	9.6%	Spruce-Pine-Fir

**Notes**

Design meets Code minimum (L/240) Total load deflection criteria.  
Design meets Code minimum (L/360) Live load deflection criteria.  
Calculations assume member is fully braced.  
Resistance Factor phi has been applied to all presented results per CSA O86.  
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.  
Design based on Dry Service Condition.  
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020

CITY OF RICHMOND HILL  
BUILDING DIVISION

08/10/2021

RECEIVED

Per: danielle devitt

WWW.NO.YAM 1498020

STRUCTURAL

COM. ONENT ONLY

BC CALC® Member Report  
Build 7493

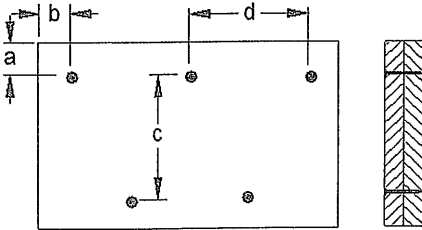
Dry | 1 span | No cant.

October 8, 2020 09:59:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B11(i1760)  
Specifier:  
Designer: LBV  
Company:

### Connection Diagram: Full Length of Member

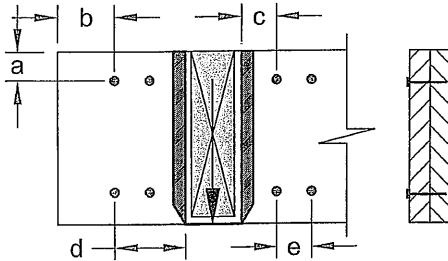


a minimum = 2"  
b minimum = 3"  
c = 5-1/2"  
d = 8"

Connectors are: 1 Nails  
3-1/2" ARDOX SPIRAL

### Connection Diagrams: Concentrated Side Loads

Connection Tag: A Applies to load tag(s): 4



a minimum = 2"  
b minimum = 4"  
c minimum = 4"  
d maximum = 12"  
e minimum = 4"  
Connectors are: 16d Nails

3-1/2" ARDOX SPIRAL



OWN NO. TAM 14480-20  
STRUCTURAL  
COMPONENT ONLY

### Disclosure

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CITY OF RICHMOND HILL  
BUILDING DEPARTMENT  
08/08/2020  
Per: [Signature]

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®

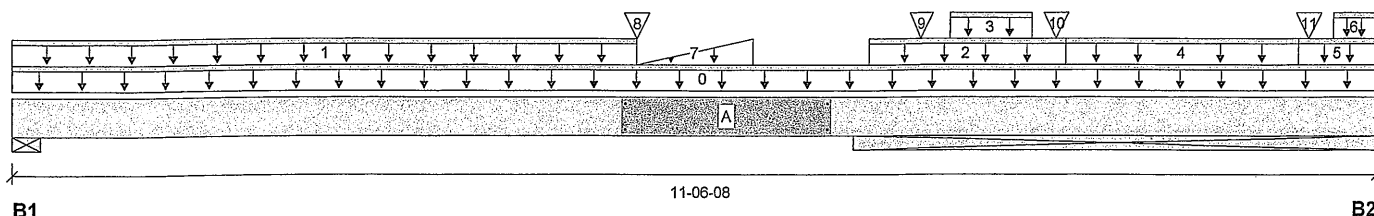
BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 20, 2020 11:03:21

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B12(i2343)  
Specifier:  
Designer: LBV  
Company:



Total Horizontal Product Length = 11-06-08

### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 4-3/8"	44 / 0	58 / 0		
B2, 54-1/8"	1015 / 0	1413 / 0	983 / 0	

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	11-06-08	Top		10			00-00-00
1	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	05-02-10	Top	12	6			n/a
2	E37(i1688)	Unf. Lin. (lb/ft)	L	07-01-14	08-10-06	Top		82	129		n/a
3	E37(i1688)	Unf. Lin. (lb/ft)	L	07-10-06	08-06-14	Top		56			n/a
4	E38(i1689)	Unf. Lin. (lb/ft)	L	08-10-06	10-10-06	Top		42			n/a
5	E21(i435)	Unf. Lin. (lb/ft)	L	10-10-06	11-06-06	Top		82			n/a
6	E21(i435)	Unf. Lin. (lb/ft)	L	11-01-14	11-06-06	Top		56	129		n/a
7	FC2 Floor Material	Trapezoidal (lb/ft)	L	05-02-10	06-02-04	Top	0				n/a
8	B13(i2176)	Conc. Pt. (lbs)	L	05-02-10	05-02-10	Top	960	555			n/a
9	E37(i1688)	Conc. Pt. (lbs)	L	07-07-06	07-07-06	Top		220	510		n/a
10	E37(i1688)	Conc. Pt. (lbs)	L	08-09-06	08-09-06	Top		93	170		n/a
11	E21(i435)	Conc. Pt. (lbs)	L	10-11-06	10-11-06	Top		90	163		n/a

### Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	221 ft-lbs	21873 ft-lbs	1.0%	1	03-09-02
End Shear	125 lbs	11571 lbs	1.1%	1	06-02-14
Total Load Deflection	L/999 (0.003")	n/a	n/a	35	03-08-05
Live Load Deflection	L/999 (0.001")	n/a	n/a	51	03-09-02
Max Defl.	0.003"	n/a	n/a	35	03-08-05
Span / Depth	8.6				
Dist. Load (B2)	365.38 lb/ft	57645.00 lb/ft	0.6%		
Conc. Load (B2)	1040 lbs	16813 lbs	6.2%		

### Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 4-3/8" x 3-1/2"	139 lbs	1.5%	0.7%	Spruce-Pine-Fir
B2	Wall/Plate 54-1/8" x 3-1/2"	4271 lbs	3.7%	1.8%	Spruce-Pine-Fir



BY: NO. TAN 14481-20  
STRUCTURAL  
COMPONENT ONLY



BC CALC® Member Report

Build 7493

Job name:

Address:

City, Province, Postal Code: RICHMOND HILL

Customer:

Code reports: CCMC 12472-R

File name: 38-9.mmdl

Description: 2ND FLR FRAMING\Flush Beams\B12(i2343)

Specifier:

Designer: LBV

Company:

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.

Design meets Code minimum (L/360) Live load deflection criteria.

Calculations assume unbraced length of Top: 04-04-08, Bottom: 04-04-08.

Resistance Factor phi has been applied to all presented results per CSA O86.

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.

Unbalanced snow loads determined from building geometry were used in selected product's verification.

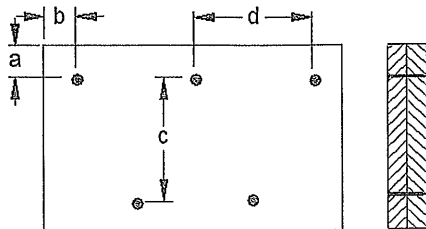
Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020

## Connection Diagram: Full Length of Member



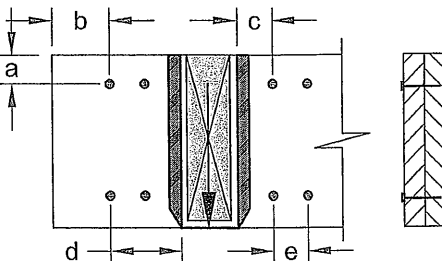
a minimum = 2"  
b minimum = 3"

c = 5-1/2"  
d = 8"

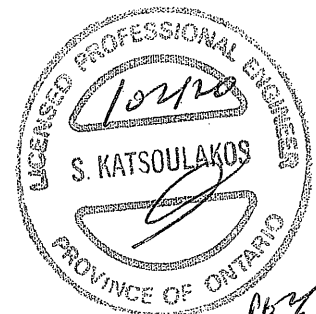
Connectors are: 3-1/2" ARDOX SPIRAL Nails

## Connection Diagrams: Concentrated Side Loads

Connection Tag: A Applies to load tag(s): 2+5



a minimum = 2"  
b minimum = 4"  
c minimum = 4"  
d maximum = 12"  
e minimum = 4"  
Connectors are: 3-1/2" ARDOX SPIRAL Nails



ENG. NO. 14481-20  
STRUCTURAL  
COMPONENT ONLY

## Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

Per: [Signature]

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,

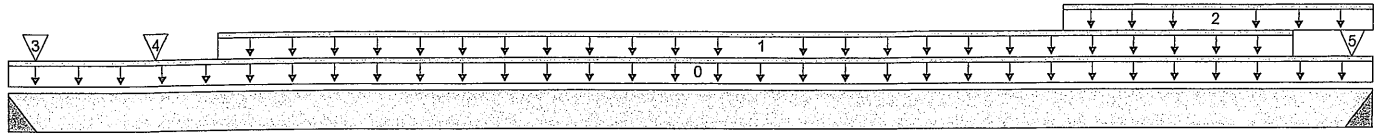
BC CALC® Member Report  
 Build 7493

Dry | 1 span | No cant.

October 8, 2020 09:59:48

Job name:  
 Address:  
 City, Province, Postal Code: RICHMOND HILL  
 Customer:  
 Code reports: CCMC 12472-R

File name: 38-9.mmdl  
 Description: 2ND FLR FRAMING\Flush Beams\B13(i1486)  
 Specifier:  
 Designer: LBV  
 Company:



B1

Total Horizontal Product Length = 15-02-04

B2

**Reaction Summary (Down / Uplift) (lbs)**

Bearing	Live	Dead	Snow	Wind
B1, 4"	945 / 0	548 / 0		
B2, 4"	1608 / 0	874 / 0		

**Load Summary**

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	15-02-04	Top		10			00-00-00
1	Smoothed Load	Unf. Lin. (lb/ft)	L	02-03-08	14-03-08	Top	112	56			n/a
2	STAIR	Unf. Lin. (lb/ft)	L	11-08-04	15-02-04	Top	240	120			n/a
3	J4(i1653)	Conc. Pt. (lbs)	L	00-03-08	00-03-08	Top	97	48			n/a
4	J4(i1638)	Conc. Pt. (lbs)	L	01-07-08	01-07-08	Top	139	69			n/a
5	J4(i1637)	Conc. Pt. (lbs)	L	14-11-08	14-11-08	Top	97	48			n/a

**Controls Summary**

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	8134 ft-lbs	23220 ft-lbs	35.0%	1	08-03-08
End Shear	2712 lbs	11571 lbs	23.4%	1	14-00-12
Total Load Deflection	L/389 (0.451")	n/a	61.6%	4	07-09-08
Live Load Deflection	L/610 (0.288")	n/a	59.0%	5	07-09-08
Max Defl.	0.451"	n/a	n/a	4	07-09-08
Span / Depth	18.5				

**Bearing Supports**

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1 Hanger	4" x 3-1/2"	2103 lbs	n/a	12.3%	HGUS410
B2 Hanger	4" x 3-1/2"	3504 lbs	n/a	20.5%	HGUS410

**Cautions**

Header for the hanger HGUS410 is a Double 1-3/4" x 9-1/2" LVL Beam.  
 Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

**Notes**

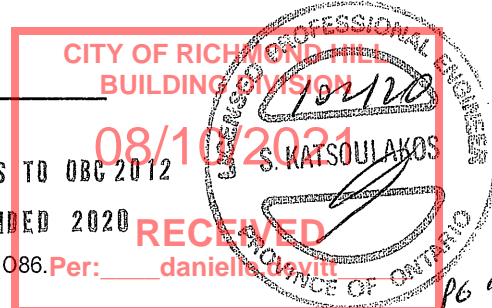
Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Calculations assume member is fully braced.  
 Hanger Manufacturer: Unassigned  
 Resistance Factor phi has been applied to all presented results per CSA O86.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020

RECEIVED

Per: danielle



ENG NO. TAM 1448220  
 STRUCTURAL  
 COMPONENT ONLY

BC CALC® Member Report

Build 7493

Job name:

Address:

City, Province, Postal Code: RICHMOND HILL

Customer:

Code reports: CCMC 12472-R

File name: 38-9.mmdl

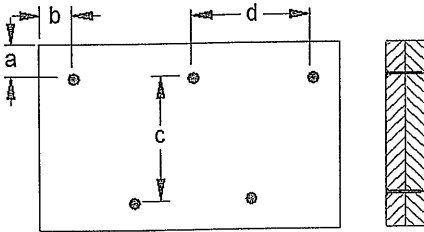
Description: 2ND FLR FRAMING\Flush Beams\B13(i1486)

Specifier:

Designer: LBV

Company:

## Connection Diagram: Full Length of Member



a minimum = 2"  
b minimum = 3"

c = 5-1/2"  
d = 8"

Calculated Side Load = 320.3 lb/ft

Connectors are: 16d Nails

3-1/2" ARDOX SPIRAL



DWG NO. YAW 14482-20

STRUCTURAL

COMPONENT ONLY

## Disclosure

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Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods.

Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

Per: Boise Cascade

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BC1®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,

Build 7493

Job name:

File name: 38-9.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B15(i1589)

City, Province, Postal Code: RICHMOND HILL

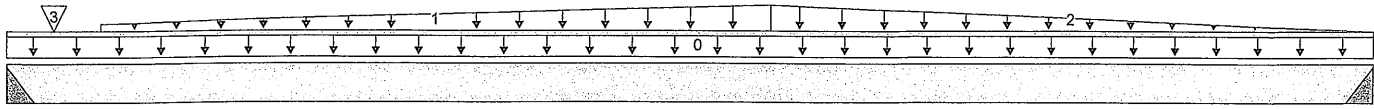
Specifier:

Customer:

Designer: LBV

Code reports: CCMC 12472-R

Company:



01-11-11

Total Horizontal Product Length = 01-11-11

### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3"	8 / 0	9 / 0		
B2, 3"	7 / 0	8 / 0		

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	01-11-11	Top	1.00	0.65	1.00	1.15	00-00-00
1	FC2 Floor Material	Trapezoidal (lb/ft)	L	00-01-10	01-01-01	Top	4	2			n/a
2	FC2 Floor Material	Trapezoidal (lb/ft)	L	01-01-01	01-11-11	Top	14	7			n/a
3	FC2 Floor Material	Conc. Pt. (lbs)	L	00-00-13	00-00-13	Top	1	0			n/a

### Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	9 ft-lbs	11610 ft-lbs	n/a	1	01-00-00
End Shear	14 lbs	5785 lbs	0.2%	1	01-00-08
Span / Depth	2.0				

### Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Hanger 3" x 1-3/4"	23 lbs	n/a	0.4%	SUL1.81/9
B2	Hanger 3" x 1-3/4"	21 lbs	n/a	0.3%	SUR1.81/9

### Cautions

Header for the hanger SUL1.81/9 is a Double 1-3/4" x 9-1/2" LVL Beam.

Hanger model SUL1.81/9 and seat length were input by the user. Hanger has not been analyzed for adequate capacity. *OK*

Header for the hanger SUR1.81/9 is a Double 1-3/4" x 9-1/2" LVL Beam.

Hanger model SUR1.81/9 and seat length were input by the user. Hanger has not been analyzed for adequate capacity. *OK*

### Notes

Calculations assume unbraced length of Top: 00-01-12, Bottom: 00-01-12.

Hanger Manufacturer: Unassigned

Resistance Factor phi has been applied to all presented results per CSA O86.

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9



DWG NO. YAW 14483-20  
STRUCTURAL  
COMPONENT ONLY

### Disclosure

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Per: Boise Cascade

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,

CONFORMS TO OBC 2012

AMENDED 2020 03/10/2021



BC CALC® Member Report

Build 7493

Job name:

File name: 38-9.mmdl

Address:

Description: 1ST FLR FRAMING\Flush Beams\B1(i2103)

City, Province, Postal Code: RICHMOND HILL

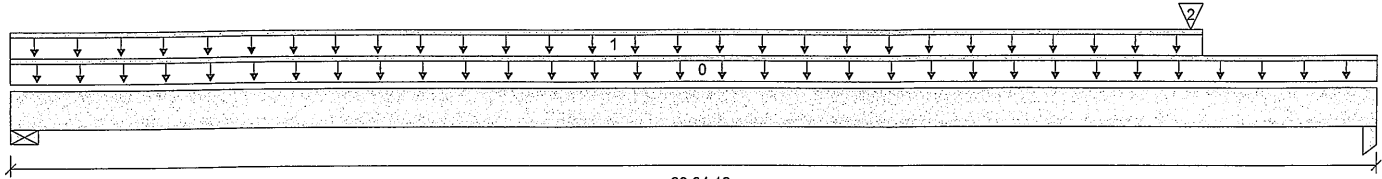
Specifier:

Customer:

Designer: LBV

Code reports: CCMC 12472-R

Company:



Total Horizontal Product Length = 08-04-12

### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 6-1/8"	225 / 0	143 / 0	7 / 0	
B2, 3-1/2"	888 / 0	533 / 0	49 / 0	

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	08-04-12	Top	1.00	0.65	1.00	1.15	00-00-00
1	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	07-03-12	Top	27	14			n/a
2	B2(i2104)	Conc. Pt. (lbs)	L	07-02-14	07-02-14	Top	905	531	56		n/a

### Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	1883 ft-lbs	11610 ft-lbs	16.2%	1	07-02-14
End Shear	2022 lbs	5785 lbs	34.9%	1	07-03-12
Total Load Deflection	L/999 (0.05")	n/a	n/a	35	04-08-13
Live Load Deflection	L/999 (0.031")	n/a	n/a	51	04-08-13
Max Defl.	0.05"	n/a	n/a	35	04-08-13
Span / Depth	9.8				

### Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 6-1/8" x 1-3/4"	523 lbs	7.9%	4.0%	Spruce-Pine-Fir
B2	Column 3-1/2" x 1-3/4"	2047 lbs	51.4%	27.4%	Unspecified

### Notes

Design meets Code minimum (L/240) Total load deflection criteria.

Design meets Code minimum (L/360) Live load deflection criteria.

Calculations assume member is fully braced.

Resistance Factor phi has been applied to all presented results per CSA O86.

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.

Unbalanced snow loads determined from building geometry were used in selected product's verification.

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020

### Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

Per: Boise Cascade

BC CALC®, BC FRAMER®, AJST™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,



DWG NO. YAW 14484-20  
STRUCTURAL  
COMPONENT ONLY



# Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP

## 1ST FLR FRAMING\Flush Beams\B2(i2104) (Flush Beam)

PASSED

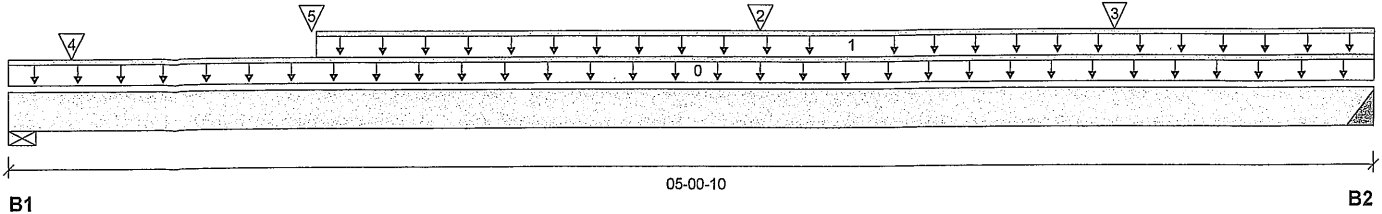
BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 8, 2020 09:59:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9.mmdl  
Description: 1ST FLR FRAMING\Flush Beams\B2(i2104)  
Specifier:  
Designer: LBV  
Company:



Total Horizontal Product Length = 05-00-10

### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	928 / 0	841 / 0	242 / 0	
B2, 4"	959 / 0	560 / 0	54 / 0	

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	05-00-10	Top		10			00-00-00
1	STAIR	Unf. Lin. (lb/ft)	L	01-01-08	05-00-10	Top	240	120			n/a
2	J5(i2079)	Conc. Pt. (lbs)	L	02-09-00	02-09-00	Top	190	95			n/a
3	J5(i2105)	Conc. Pt. (lbs)	L	04-01-00	04-01-00	Top	168	84			n/a
4	-	Conc. Pt. (lbs)	L	00-02-12	00-02-12	Top		68			n/a
5	-	Conc. Pt. (lbs)	L	01-01-05	01-01-05	Top	586	634	296		n/a

### Controls Summary

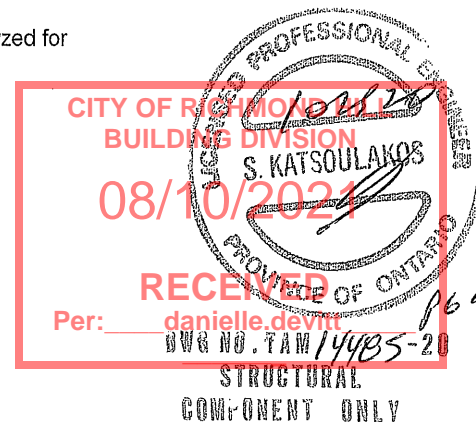
	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	2665 ft-lbs	23220 ft-lbs	11.5%	1	02-03-08
End Shear	2500 lbs	11571 lbs	21.6%	1	01-01-00
Total Load Deflection	L/999 (0.015")	n/a	n/a	35	02-05-00
Live Load Deflection	L/999 (0.009")	n/a	n/a	51	02-05-08
Max Defl.	0.015"	n/a	n/a	35	02-05-00
Span / Depth	5.7				

### Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 3-1/2" x 3-1/2"	2684 lbs	35.6%	18.0%	Spruce-Pine-Fir
B2	Hanger 4" x 3-1/2"	2193 lbs	n/a	12.8%	HGUS410

### Cautions

Header for the hanger HGUS410 is a Single 1-3/4" x 9-1/2" LVL Beam.  
Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.



BC CALC® Member Report

Build 7493

Job name:

Address:

City, Province, Postal Code: RICHMOND HILL

Customer:

Code reports: CCMC 12472-R

File name: 38-9.mmdl

Description: 1ST FLR FRAMING\Flush Beams\B2(i2104)

Specifier:

Designer: LBV

Company:

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.

Design meets Code minimum (L/360) Live load deflection criteria.

Calculations assume member is fully braced.

Hanger Manufacturer: Unassigned

Resistance Factor phi has been applied to all presented results per CSA O86.

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.

Unbalanced snow loads determined from building geometry were used in selected product's verification.

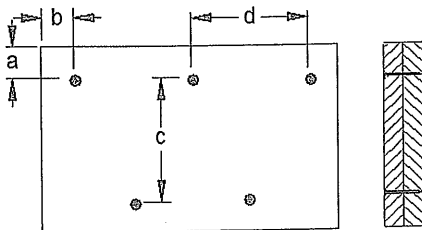
Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020

## Connection Diagram: Full Length of Member



a minimum = 2"  
b minimum = 3"

c = 5-1/2"  
d = 2-1/2"

Calculated Side Load = 201.9 lb/ft

Connectors are: Nails

3-1/2" ARDOX SPIRAL



DWG NO. TAW 1448520  
STRUCTURAL  
COMPONENT ONLY

## Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

CITY OF RICHMOND HILL  
BUILDING DEPARTMENT  
08/10/2021  
RECEIVED  
Per: [Signature]

BC CALC®, BC FRAMER®, AJS™,  
ALLJOIST®, BC RIM BOARD™, BCI®,  
BOISE GLULAM™, BC FloorValue®,  
VERSA-LAM®, VERSA-RIM PLUS®,





BC CALC® Member Report

Build 7493

Job name:

File name: 38-9.mmdl

Address:

Description: 1ST FLR FRAMING\Flush Beams\B4(i2050)

City, Province, Postal Code: RICHMOND HILL

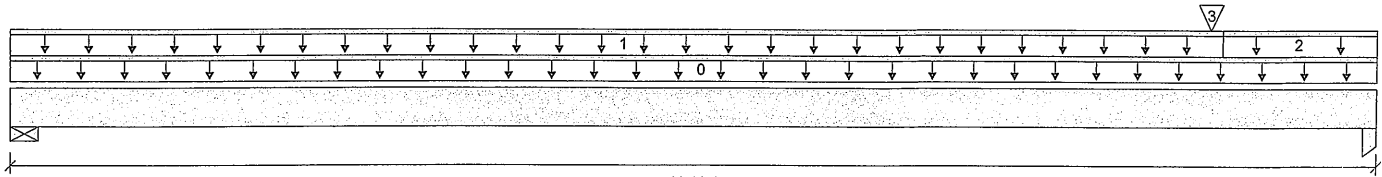
Specifier:

Customer:

Designer: LBV

Code reports: CCMC 12472-R

Company:



B1

Total Horizontal Product Length = 08-03-00

B2

### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 4-3/8"	188 / 0	116 / 0		
B2, 1-3/4"	660 / 0	364 / 0		

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	08-03-00	Top	1.00	0.65	1.00	1.15	00-00-00
1	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	07-03-12	Top	27	13			n/a
2	FC1 Floor Material	Unf. Lin. (lb/ft)	L	07-03-12	08-03-00	Top	12	6			n/a
3	B6(i2092)	Conc. Pt. (lbs)	L	07-02-14	07-02-14	Top	641	337			n/a

### Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	1327 ft-lbs	11610 ft-lbs	11.4%	1	06-09-03
End Shear	1435 lbs	5785 lbs	24.8%	1	07-03-12
Total Load Deflection	L/999 (0.039")	n/a	n/a	4	04-06-15
Live Load Deflection	L/999 (0.025")	n/a	n/a	5	04-06-15
Max Defl.	0.039"	n/a	n/a	4	04-06-15
Span / Depth	9.9				

### Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 4-3/8" x 1-3/4"	427 lbs	9.1%	4.6%	Spruce-Pine-Fir
B2	Column 1-3/4" x 1-3/4"	1445 lbs	72.6%	38.7%	Unspecified

### Notes

Design meets Code minimum (L/240) Total load deflection criteria.

Design meets Code minimum (L/360) Live load deflection criteria.

Calculations assume member is fully braced.

Resistance Factor phi has been applied to all presented results per CSA O86.

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020

CITY OF RICHMOND HILL  
BUILDING DEPARTMENT  
08/10/2021  
Per: [Signature] devitt

DWG NO. YAM 14487-20  
STRUCTURAL  
COMPONENT ONLY

### Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,

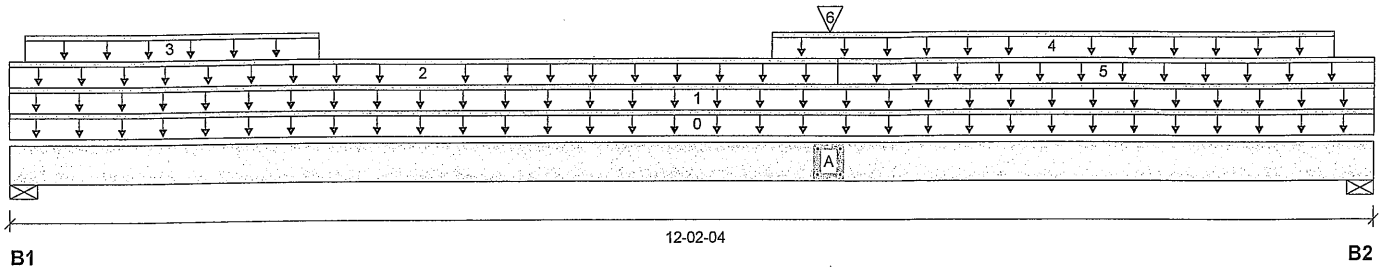
BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 8, 2020 09:59:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9.mmdl  
Description: 1ST FLR FRAMING\Flush Beams\B5(i2093)  
Specifier:  
Designer: LBV  
Company:



Total Horizontal Product Length = 12-02-04

### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 4-3/8"	449 / 0	521 / 0		
B2, 2-3/8"	566 / 0	619 / 0		

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	12-02-04	Top		10			00-00-00
1	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	12-02-04	Top	19	10			n/a
2	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	07-03-12	Top	7	4			n/a
3	4(i1022)	Unf. Lin. (lb/ft)	L	00-01-10	02-08-14	Top		65			n/a
4	3(i1021)	Unf. Lin. (lb/ft)	L	06-08-14	11-09-14	Top		65			n/a
5	FC1 Floor Material	Unf. Lin. (lb/ft)	L	07-03-12	12-02-04	Top	6	3			n/a
6	B6(i2092)	Conc. Pt. (lbs)	L	07-02-14	07-02-14	Top	698	366			n/a

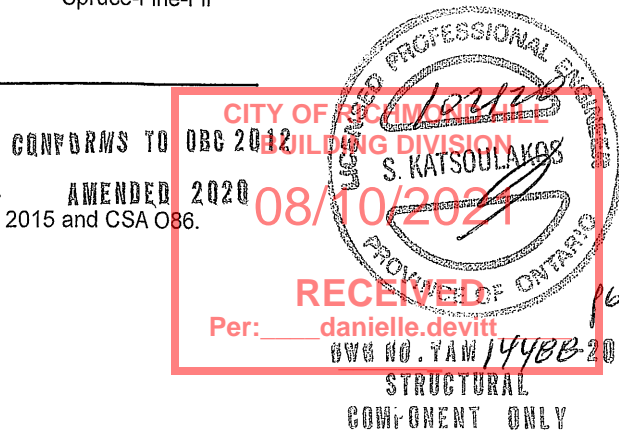
### Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	6160 ft-lbs	23220 ft-lbs	26.5%	1	07-02-14
End Shear	1558 lbs	11571 lbs	13.5%	1	11-02-06
Total Load Deflection	L/743 (0.19")	n/a	32.3%	4	06-05-13
Live Load Deflection	L/999 (0.1")	n/a	n/a	5	06-04-06
Max Defl.	0.19"	n/a	n/a	4	06-05-13
Span / Depth	14.8				

Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 4-3/8" x 3-1/2"	1325 lbs	14.1%	7.1%	Spruce-Pine-Fir
B2	Wall/Plate 2-3/8" x 3-1/2"	1623 lbs	31.7%	16.0%	Spruce-Pine-Fir

### Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
Design meets Code minimum (L/360) Live load deflection criteria.  
Calculations assume member is fully braced.  
Resistance Factor phi has been applied to all presented results per CSA O86.  
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.  
Design based on Dry Service Condition.  
Importance Factor : Normal Part code : Part 9





BC CALC® Member Report  
Build 7493

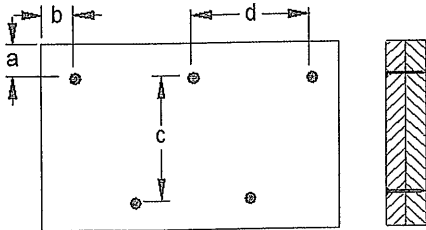
Dry | 1 span | No cant.

October 8, 2020 09:59:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9.mmdl  
Description: 1ST FLR FRAMING\Flush Beams\B5(i2093) (Flush Beam)  
Specifier:  
Designer: LBV  
Company:

### Connection Diagram: Full Length of Member

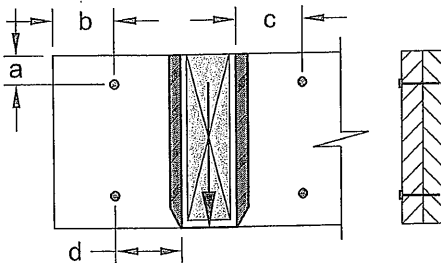


a minimum = 2"  
b minimum = 3"  
c = 5-1/2"  
d = 3"

Connectors are: 1 Nails  
3-1/2" ARDOX SPIRAL

### Connection Diagrams: Concentrated Side Loads

Connection Tag: A Applies to load tag(s): 5



a minimum = 2"  
b minimum = 4"  
c minimum = 4"  
d maximum = 12"  
Connectors are: 16d Nails

3-1/2" ARDOX SPIRAL



DWG NO. YAM/4488-20  
STRUCTURAL  
COMPONENT ONLY

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CITY OF RICHMOND HILL  
BUILDING DEPARTMENT  
08/10/2021  
Per: [Signature]

BC CALC®, BC FRAMER®, AJS™,  
ALLJOIST®, BC RIM BOARD™, BCI®,  
BOISE GLULAM™, BC FloorValue®,  
VERSA-LAM®, VERSA-RIM PLUS®,

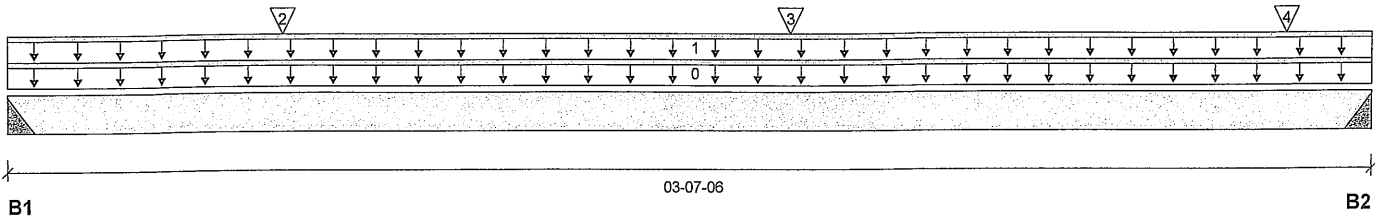
BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 8, 2020 09:59:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9.mmdl  
Description: 1ST FLR FRAMING\Flush Beams\B6(i2092)  
Specifier:  
Designer: LBV  
Company:



### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 4"	646 / 0	340 / 0		
B2, 4"	692 / 0	363 / 0		

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	03-07-06	Top		10			00-00-00
1	STAIR	Unf. Lin. (lb/ft)	L	00-00-00	03-07-06	Top	240	120			n/a
2	J5(i2058)	Conc. Pt. (lbs)	L	00-08-10	00-08-10	Top	154	77			n/a
3	J5(i2086)	Conc. Pt. (lbs)	L	02-00-10	02-00-10	Top	193	96			n/a
4	J5(i2073)	Conc. Pt. (lbs)	L	03-04-10	03-04-10	Top	124	62			n/a

### Controls Summary

	Factored Demand	Factored Resistance	Demand/ Resistance	Case	Location
Pos. Moment	969 ft-lbs	23220 ft-lbs	4.2%	1	02-00-10
End Shear	641 lbs	11571 lbs	5.5%	1	02-05-14
Total Load Deflection	L/999 (0.002")	n/a	n/a	4	01-09-13
Live Load Deflection	L/999 (0.001")	n/a	n/a	5	01-09-13
Max Defl.	0.002"	n/a	n/a	4	01-09-13
Span / Depth	3.9				

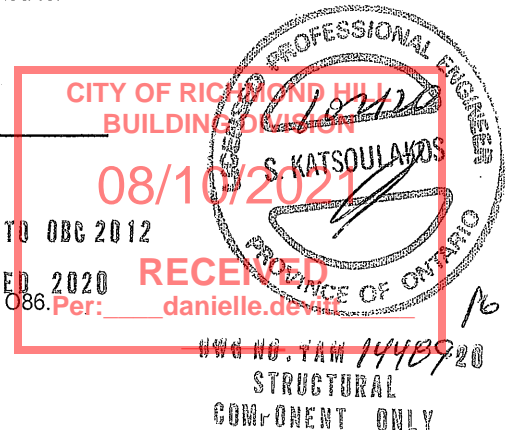
Bearing Supports	Dim. (LxW)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B1 Hanger	4" x 3-1/2"	1395 lbs	n/a	8.2%	HGUS410
B2 Hanger	4" x 3-1/2"	1492 lbs	n/a	8.7%	HGUS410

### Cautions

Header for the hanger HGUS410 is a Single 1-3/4" x 9-1/2" LVL Beam.  
Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.  
Header for the hanger HGUS410 is a Double 1-3/4" x 9-1/2" LVL Beam.

### Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
Design meets Code minimum (L/360) Live load deflection criteria.  
Calculations assume member is fully braced.  
Hanger Manufacturer: Unassigned  
Resistance Factor phi has been applied to all presented results per CSA O86.  
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.  
Design based on Dry Service Condition.  
Importance Factor : Normal Part code : Part 9





# Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP

PASSED

## 1ST FLR FRAMING\Flush Beams\B6(i2092) (Flush Beam)

Dry | 1 span | No cant.

October 8, 2020 09:59:48

BC CALC® Member Report

Build 7493

Job name:

Address:

City, Province, Postal Code: RICHMOND HILL

Customer:

Code reports: CCMC 12472-R

File name: 38-9.mmdl

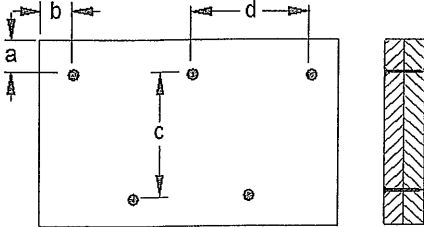
Description: 1ST FLR FRAMING\Flush Beams\B6(i2092)

Specifier:

Designer: LBV

Company:

### Connection Diagram: Full Length of Member



a minimum = 2"

c = 5-1/2"

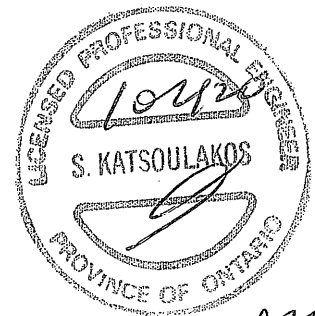
b minimum = 3"

d = 8"

Calculated Side Load = 204.8 lb/ft

Connectors are: 1 Nails

3-1/2" ARDOX SPIRAL



ENG NO. TAM 14489-20  
STRUCTURAL  
COMPONENT ONLY

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Per: Gamelle Devitt

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,



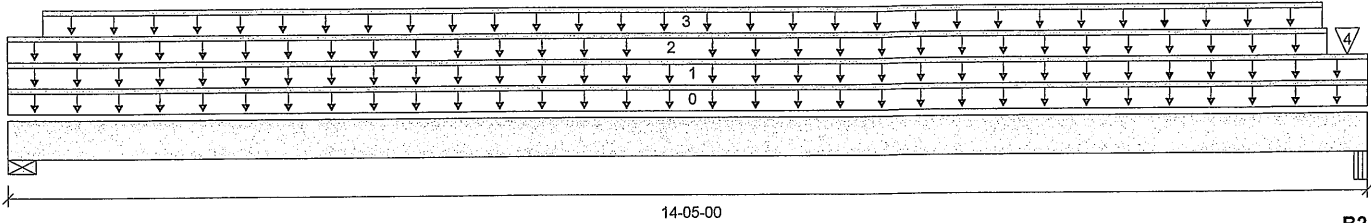
BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 8, 2020 09:40:12

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9 SUNKEN.mmdl  
Description: 1ST FLR FRAMING\Flush Beams\B16(i2058)  
Specifier:  
Designer: LBV  
Company:



Total Horizontal Product Length = 14-05-00

### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 2-3/8"	95 / 0	551 / 0		
B2, 5-1/4"	298 / 0	691 / 0		

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	14-05-00	Top		10			00-00-00
1	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	14-05-00	Top	8	4			n/a
2	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	13-11-12	Top	6	3			n/a
3	5(i1855)	Unf. Lin. (lb/ft)	L	00-04-06	13-11-02	Top		65			n/a
4	2(i508)	Conc. Pt. (lbs)	L	14-02-06	14-02-06	Top	203	130			n/a

### Controls Summary

	Factored Demand	Factored Resistance	Demand/ Resistance	Case	Location
Pos. Moment	2743 ft-lbs	15093 ft-lbs	18.2%	0	07-01-01
End Shear	759 lbs	7521 lbs	10.1%	0	13-02-04
Total Load Deflection	L/1051 (0.159")	n/a	22.8%	4	07-01-01
Live Load Deflection	L/999 (0.022")	n/a	n/a	5	07-01-01
Max Defl.	0.159"	n/a	n/a	4	07-01-01
Span / Depth	17.6				

### Bearing Supports

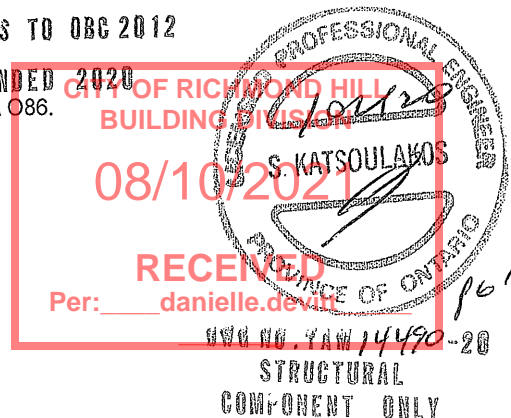
	Dim. (LxW)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B1	Wall/Plate 2-3/8" x 3-1/2"	772 lbs	23.2%	11.7%	Spruce-Pine-Fir
B2	Beam 5-1/4" x 3-1/2"	968 lbs	19.0%	6.6%	Unspecified

### Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
Design meets Code minimum (L/360) Live load deflection criteria.  
Calculations assume member is fully braced.  
Resistance Factor phi has been applied to all presented results per CSA O86.  
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.  
Design based on Dry Service Condition.  
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020



BC CALC® Member Report

Build 7493

Job name:

File name: 38-9 SUNKEN.mmdl

Address:

Description: 1ST FLR FRAMING\Flush Beams\B16(i2058)

City, Province, Postal Code: RICHMOND HILL

Specifier:

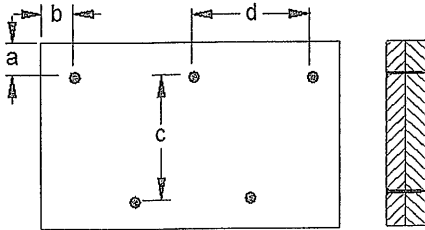
Customer:

Designer: LBV

Code reports: CCMC 12472-R

Company:

## Connection Diagram: Full Length of Member



a minimum = 2"

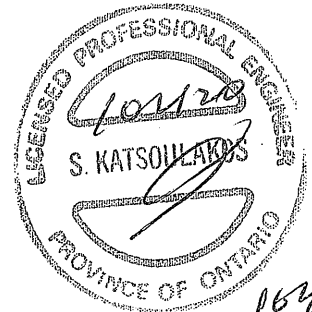
c = 5-1/2"

b minimum = 3"

d = 8"

Connectors are: Nails

3-1/2" ARDOX SPIRAL



ENG. NO. TAM 14490-20

STRUCTURAL

COMPONENT ONLY

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Per: Boise Cascade

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BC®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®.

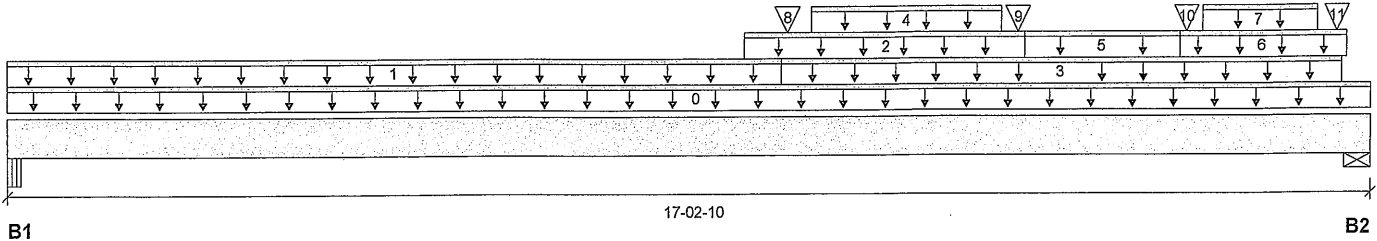
BC CALC® Member Report  
 Build 7493

Dry | 1 span | No cant.

October 8, 2020 09:20:54

Job name:  
 Address:  
 City, Province, Postal Code: RICHMOND HILL  
 Customer:  
 Code reports: CCMC 12472-R

File name: 38-9.mmdl  
 Description: 2ND FLR FRAMING\Flush Beams\B7(i1558)  
 Specifier:  
 Designer: LBV  
 Company:



Total Horizontal Product Length = 17'-02-10"

**Reaction Summary (Down / Uplift) (lbs)**

Bearing	Live	Dead	Snow	Wind
B1, 4'-1/8"	252 / 0	588 / 0	431 / 0	
B2, 7'-1/4"	208 / 0	1514 / 0	1802 / 0	

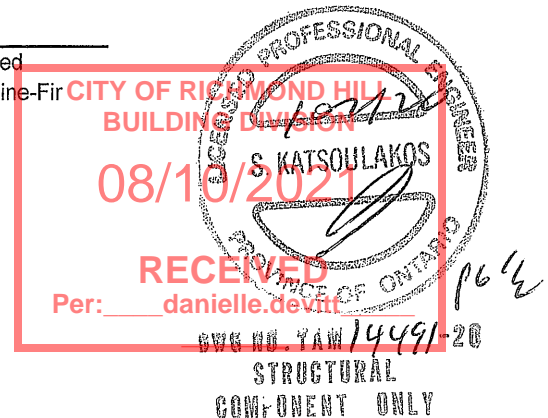
**Load Summary**

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	17-02-10	Top		14			00-00-00
1	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	09-07-14	Top	31	16			n/a
2	E30(i445)	Unf. Lin. (lb/ft)	L	09-02-06	12-09-06	Top		81			n/a
3	FC2 Floor Material	Unf. Lin. (lb/ft)	L	09-07-14	16-10-02	Top	22	11			n/a
4	E30(i445)	Unf. Lin. (lb/ft)	L	10-00-06	12-05-14	Top		56	129		n/a
5	E31(i446)	Unf. Lin. (lb/ft)	L	12-09-06	14-09-06	Top		41			n/a
6	E25(i440)	Unf. Lin. (lb/ft)	L	14-09-06	16-10-14	Top		81			n/a
7	E25(i440)	Unf. Lin. (lb/ft)	L	15-00-14	16-06-06	Top		56	129		n/a
8	-	Conc. Pt. (lbs)	L	09-08-13	09-08-13	Top		298	608		n/a
9	E30(i445)	Conc. Pt. (lbs)	L	12-08-06	12-08-06	Top		93	170		n/a
10	E25(i440)	Conc. Pt. (lbs)	L	14-10-06	14-10-06	Top		90	163		n/a
11	E25(i440)	Conc. Pt. (lbs)	L	16-09-06	16-09-06	Top		363	788		n/a

**Controls Summary**

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	12139 ft-lbs	36222 ft-lbs	33.5%	13	09-09-06
End Shear	2997 lbs	17356 lbs	17.3%	13	15-09-14
Total Load Deflection	L/376 (0.523")	n/a	63.8%	35	08-11-05
Live Load Deflection	L/695 (0.283")	n/a	51.8%	51	08-11-05
Max Defl.	0.523"	n/a	n/a	35	08-11-05
Span / Depth	20.7				

Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Beam 4'-1/8" x 5'-1/4"	1635 lbs	17.7%	6.2%	Unspecified
B2	Wall/Plate 7'-1/4" x 5'-1/4"	4804 lbs	20.5%	10.3%	Spruce-Pine-Fir



BC CALC® Member Report  
 Build 7493

Dry | 1 span | No cant.

October 8, 2020 09:20:54

Job name:  
 Address:  
 City, Province, Postal Code: RICHMOND HILL  
 Customer:  
 Code reports: CCMC 12472-R

File name: 38-9.mmdl  
 Description: 2ND FLR FRAMING\Flush Beams\B7(i1558)  
 Specifier:  
 Designer: LBV  
 Company:

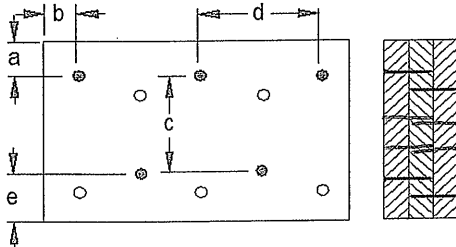
## Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Calculations assume member is fully braced.  
 Resistance Factor phi has been applied to all presented results per CSA O86.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.  
 Unbalanced snow loads determined from building geometry were used in selected product's verification.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 9

**CONFORMS TO OBC 2012**

**AMENDED 2020**

## Connection Diagram: Full Length of Member



*4 P.O.W.S*

a minimum = 3"  
 b minimum = 3"

c = 6-1/2"  
 d = 92"  
 e minimum = 3"

Nailing applies to both sides of the member  
 Connectors are: *1* Nails  
**3-1/2" ARDOX SPIRAL**



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Per: danielle.devitt

BC CALC®, BC FRAMER®, AJST™, ALLJOIST®, BC RIM BOARD™, BCi®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,



BC CALC® Member Report

Dry | 1 span | No cant.

October 8, 2020 09:20:54

Build 7493

Job name:

File name: 38-9.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B8(i1544)

City, Province, Postal Code: RICHMOND HILL

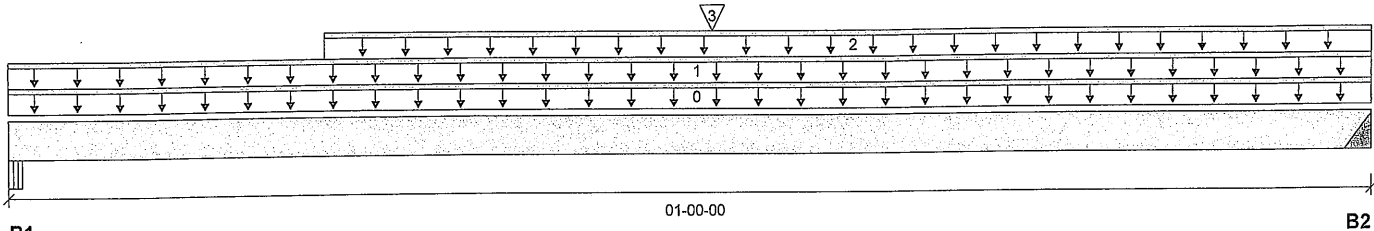
Specifier:

Customer:

Designer: LBV

Code reports: CCMC 12472-R

Company:



Total Horizontal Product Length = 01-00-00

### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 5-1/4"	118 / 0	133 / 0	51 / 0	
B2, 4"		73 / 0	71 / 0	

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	01-00-00	Top		10			00-00-00
1	E26(i439)	Unf. Lin. (lb/ft)	L	00-00-00	01-00-00	Top		81			n/a
2	E26(i439)	Unf. Lin. (lb/ft)	L	00-02-12	01-00-00	Top		73	159		n/a
3	J3(i1588)	Conc. Pt. (lbs)	L	00-06-02	00-06-02	Top	118	59			n/a

### Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	7 ft-lbs	23220 ft-lbs	n/a	13	00-06-10
End Shear	51 lbs	11571 lbs	0.4%	13	00-05-04
Span / Depth	0.4				

### Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1 Beam	5-1/4" x 3-1/2"	394 lbs	5.0%	1.8%	Unspecified
B2 Hanger	4" x 3-1/2"	198 lbs	n/a	1.2%	HGUS410

### Cautions

Header for the hanger HGUS410 is a Triple 1-3/4" x 9-1/2" LVL Beam.  
Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

### Notes

Calculations assume member is fully braced.  
Hanger Manufacturer: Unassigned  
Resistance Factor phi has been applied to all presented results per CSA O86.  
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.  
Unbalanced snow loads determined from building geometry were used in selected product's verification.  
Design based on Dry Service Condition.  
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020



COM, ONENT ONLY



Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP  
2ND FLR FRAMING\Flush Beams\B8(i1544) (Flush Beam)

PASSED

BC CALC® Member Report  
Build 7493

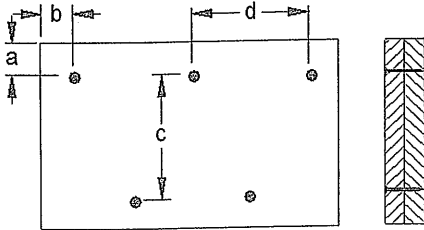
Dry | 1 span | No cant.

October 8, 2020 09:20:54

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B8(i1544)  
Specifier:  
Designer: LBV  
Company:

Connection Diagram: Full Length of Member



a minimum = 2"      c = 5-1/2"  
b minimum = 3"      d = 4"

Calculated Side Load = 125.4 lb/ft

Connectors are: 1 Nails  
3-1/2" ARDOX SPIRAL



STRUCTURAL  
COM. ONENT ONLY

Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

Per: damiele.devitt

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,

Build 7493

Job name:

File name: 38-9 EL B.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B7B(i2121)

City, Province, Postal Code: RICHMOND HILL

Specifier:

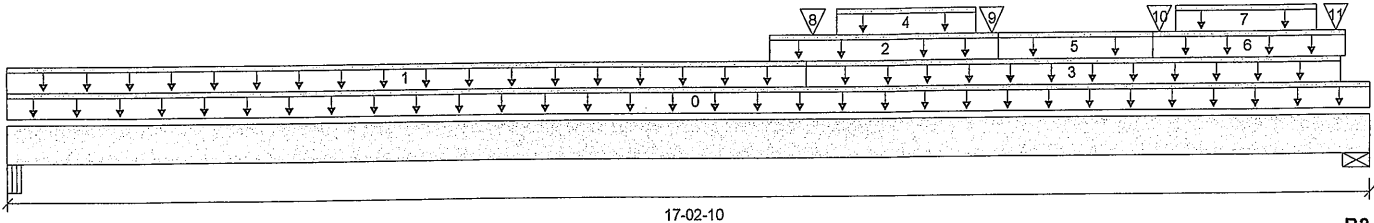
Customer:

Designer: LBV

Code reports:

CCMC 12472-R

Company:



B1

Total Horizontal Product Length = 17'-02-10"

B2

### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 4'-1/8"	253 / 0	562 / 0	402 / 0	
B2, 7'-1/4"	210 / 0	1496 / 0	1789 / 0	

### Load Summary

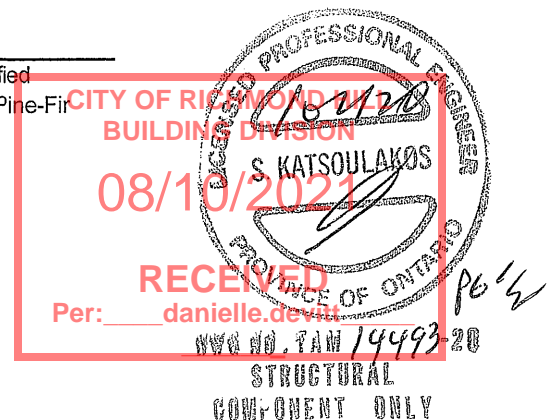
Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	17-02-10	Top		14			00-00-00
1	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	09-11-14	Top	31	16			n/a
2	E30(i445)	Unf. Lin. (lb/ft)	L	09-06-06	12-05-06	Top		81			n/a
3	FC2 Floor Material	Unf. Lin. (lb/ft)	L	09-11-14	16-10-02	Top	22	11			n/a
4	E30(i445)	Unf. Lin. (lb/ft)	L	10-04-06	12-01-14	Top		56	129		n/a
5	E31(i446)	Unf. Lin. (lb/ft)	L	12-05-06	14-05-06	Top		41			n/a
6	E25(i440)	Unf. Lin. (lb/ft)	L	14-05-06	16-10-14	Top		81			n/a
7	E25(i440)	Unf. Lin. (lb/ft)	L	14-08-14	16-06-06	Top		56	129		n/a
8	-	Conc. Pt. (lbs)	L	10-00-13	10-00-13	Top		298	608		n/a
9	E30(i445)	Conc. Pt. (lbs)	L	12-04-06	12-04-06	Top		93	170		n/a
10	E25(i440)	Conc. Pt. (lbs)	L	14-06-06	14-06-06	Top		90	163		n/a
11	E25(i440)	Conc. Pt. (lbs)	L	16-09-06	16-09-06	Top		363	788		n/a

### Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	11713 ft-lbs	36222 ft-lbs	32.3%	13	10-01-06
End Shear	2956 lbs	17356 lbs	17.0%	13	15-09-14
Total Load Deflection	L/392 (0.502")	n/a	61.3%	35	09-00-01
Live Load Deflection	L/721 (0.273")	n/a	49.9%	51	09-00-01
Max Defl.	0.502"	n/a	n/a	35	09-00-01
Span / Depth	20.7				

### Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Beam 4'-1/8" x 5'-1/4"	1560 lbs	16.9%	5.9%	Unspecified
B2	Wall/Plate 7'-1/4" x 5'-1/4"	4763 lbs	20.3%	10.3%	Spruce-Pine-Fir





**Triple 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP**  
**2ND FLR FRAMING\Flush Beams\B7B(i2121) (Flush Beam)**

**PASSED**

BC CALC® Member Report  
 Build 7493

Dry | 1 span | No cant.

October 8, 2020 10:22:46

Job name:  
 Address:  
 City, Province, Postal Code: RICHMOND HILL  
 Customer:  
 Code reports: CCMC 12472-R

File name: 38-9 EL B.mmdl  
 Description: 2ND FLR FRAMING\Flush Beams\B7B(i2121)  
 Specifier:  
 Designer: LBV  
 Company:

**Notes**

Design meets Code minimum (L/240) Total load deflection criteria.

Design meets Code minimum (L/360) Live load deflection criteria.

Calculations assume member is fully braced.

Resistance Factor phi has been applied to all presented results per CSA O86.

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.

Unbalanced snow loads determined from building geometry were used in selected product's verification.

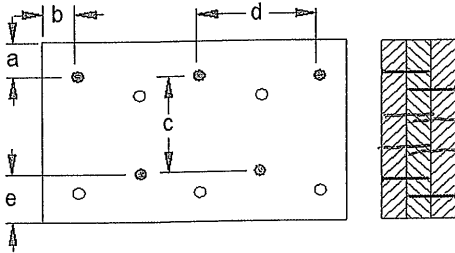
Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

**CONFORMS TO OBC 2012**

**AMENDED 2020**

**Connection Diagram: Full Length of Member**



*4 rows*

a minimum = 1"  
 b minimum = 3"

c = 6 1/2"  
 d = 12"  
 e minimum = 3"

Nailing applies to both sides of the member  
 Connectors are: *A* Nails

**3-1/2" ARDOX SPIRAL**



**UVC NO. TAM 14493-20**  
**STRUCTURAL**  
**COMPONENT ONLY**

**Disclosure**

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**CITY OF RICHMOND HILL**  
**BUILDING DIVISION**  
**09/12/2021**  
**RECEIVED**  
 Per: danielle.devitt

BC CALC®, BC FRAMER®, AJST™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,



BC CALC® Member Report

Dry | 1 span | No cant.

October 8, 2020 10:22:46

Build 7493

Job name:

File name: 38-9 EL B.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B8B(i2113)

City, Province, Postal Code: RICHMOND HILL

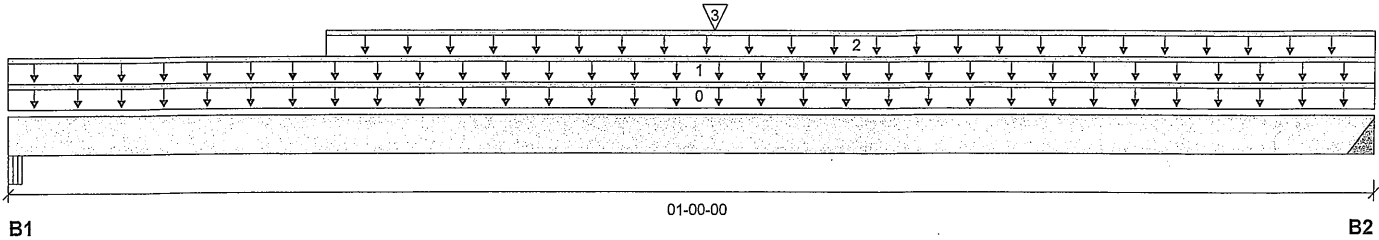
Specifier:

Customer:

Designer: LBV

Code reports: CCMC 12472-R

Company:



### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 5-1/4"	122 / 0	135 / 0	51 / 0	
B2, 4"		73 / 0	71 / 0	

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	01-00-00	Top		10			00-00-00
1	E26(i439)	Unf. Lin. (lb/ft)	L	00-00-00	01-00-00	Top		81			n/a
2	E26(i439)	Unf. Lin. (lb/ft)	L	00-02-12	01-00-00	Top		73	159		n/a
3	J3(i2134)	Conc. Pt. (lbs)	L	00-06-02	00-06-02	Top	122	61			n/a

### Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	7 ft-lbs	23220 ft-lbs	n/a	13	00-06-10
End Shear	51 lbs	11571 lbs	0.4%	13	00-05-04
Span / Depth	0.4				

### Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1 Beam	5-1/4" x 3-1/2"	403 lbs	5.1%	1.8%	Unspecified
B2 Hanger	4" x 3-1/2"	198 lbs	n/a	1.2%	HGUS410

### Cautions

Header for the hanger HGUS410 is a Triple 1-3/4" x 9-1/2" LVL Beam.

Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

### Notes

Calculations assume member is fully braced.

Hanger Manufacturer: Unassigned

Resistance Factor phi has been applied to all presented results per CSA O86.

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.

Unbalanced snow loads determined from building geometry were used in selected product's verification.

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

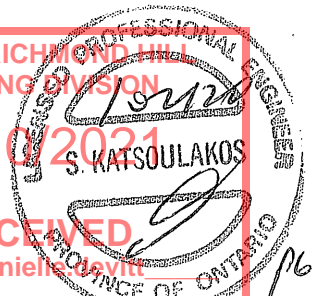
AMENDED

2020 OF RICHMOND HILL  
 BUILDING DIVISION

08/10/2021

RECEIVED

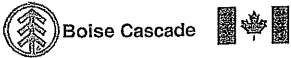
Per: daniel levitt



006 NO. 14994-20

STRUCTURAL

COMMENT ONLY



**Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP**  
**2ND FLR FRAMING\Flush Beams\B8B(i2113) (Flush Beam)**

**PASSED**

BC CALC® Member Report  
Build 7493

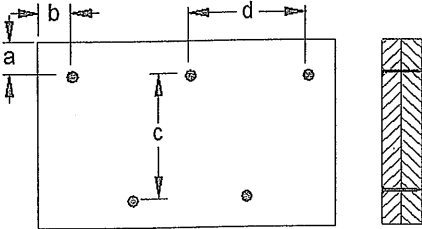
Dry | 1 span | No cant.

October 8, 2020 10:22:46

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9 EL B.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B8B(i2113)  
Specifier:  
Designer: LBV  
Company:

**Connection Diagram: Full Length of Member**



a minimum = 2"      c = 5-1/2"  
b minimum = 3"      d = 4"

Calculated Side Load = 129.6 lb/ft

Connectors are: **3-1/2" ARDOX SPIRAL** Nails



**Disclosure**

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Per: Gamelle Devitt

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,

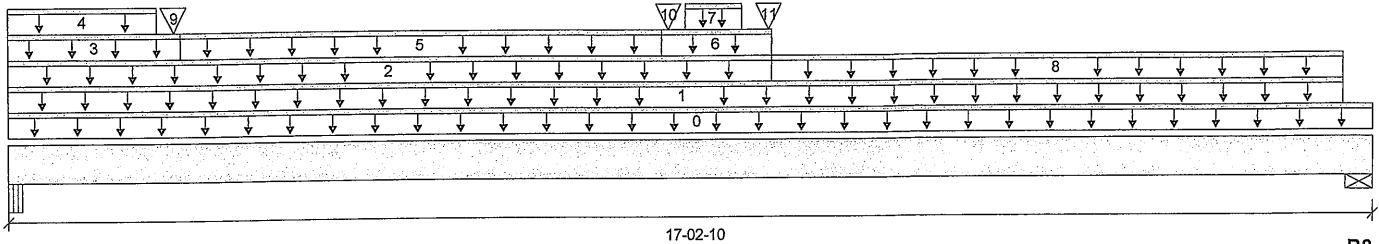
BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 8, 2020 10:41:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9 EL C.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B7C(i3140)  
Specifier:  
Designer: LBV  
Company:



B1

Total Horizontal Product Length = 17-02-10

B2

### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 4-1/8"	279 / 0	1258 / 0	1152 / 0	
B2, 7-1/4"	294 / 0	780 / 0	667 / 0	

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	17-02-10	Top		14			00-00-00
1	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	16-10-02	Top	21	11			n/a
2	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	09-06-06	Top	9	4			n/a
3	E39(i2459)	Unf. Lin. (lb/ft)	L	00-00-00	02-01-14	Top		81			n/a
4	E39(i2459)	Unf. Lin. (lb/ft)	L	00-00-00	01-10-06	Top		56	129		n/a
5	E40(i2448)	Unf. Lin. (lb/ft)	L	02-01-14	08-01-14	Top		41			n/a
6	E41(i2451)	Unf. Lin. (lb/ft)	L	08-01-14	09-06-06	Top		81			n/a
7	E41(i2451)	Unf. Lin. (lb/ft)	L	08-05-06	09-01-14	Top		56	129		n/a
8	FC2 Floor Material	Unf. Lin. (lb/ft)	L	09-06-06	16-10-02	Top	12	6			n/a
9	E39(i2459)	Conc. Pt. (lbs)	L	02-00-14	02-00-14	Top		234	426		n/a
10	E41(i2451)	Conc. Pt. (lbs)	L	08-02-14	08-02-14	Top		233	423		n/a
11	-	Conc. Pt. (lbs)	L	09-05-15	09-05-15	Top	41	381	639		n/a

Controls Summary	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	14428 ft-lbs	36222 ft-lbs	39.8%	13	08-09-10
End Shear	3090 lbs	17356 lbs	17.8%	13	01-01-10
Total Load Deflection	L/307 (0.641")	n/a	78.2%	35	08-05-06
Live Load Deflection	L/558 (0.353")	n/a	64.5%	51	08-05-06
Max Defl.	0.641"	n/a	n/a	35	08-05-06
Span / Depth	20.7				

Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Beam 4-1/8" x 5-1/4"	3580 lbs	38.7%	13.5%	Unspecified
B2	Wall/Plate 7-1/4" x 5-1/4"	2270 lbs	9.7%	4.9%	Spruce-Pine-Fir



BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 8, 2020 10:41:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9 EL C.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B7C(i3140)  
Specifier:  
Designer: LBV  
Company:

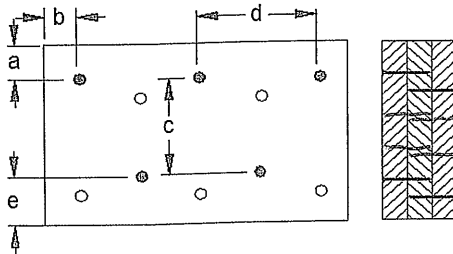
## Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
Design meets Code minimum (L/360) Live load deflection criteria.  
Calculations assume member is fully braced.  
Resistance Factor phi has been applied to all presented results per CSA O86.  
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.  
Unbalanced snow loads determined from building geometry were used in selected product's verification.  
Design based on Dry Service Condition.  
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020

## Connection Diagram: Full Length of Member



a minimum = 1"  
b minimum = 3"

c = 6-1/2"  
d = 12"  
e minimum = 3"

Nailing applies to both sides of the member  
Connectors are: 1 Nails

3-1/2" ARDOX SPIRAL



DWG NO. TAM/14495-20  
STRUCTURAL  
COMPONENT ONLY

## Disclosure

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Per: danielle.devitt

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,



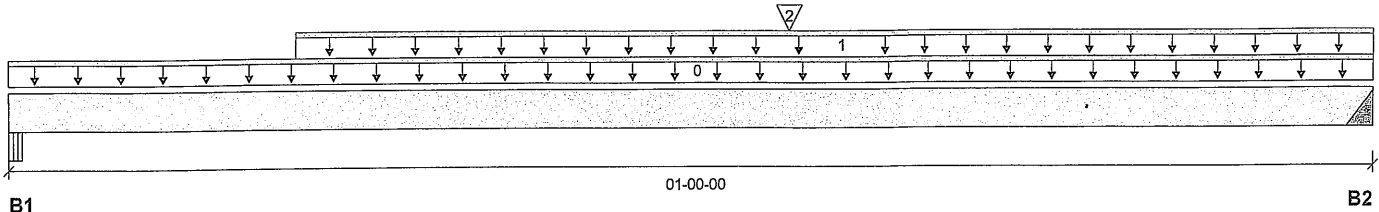
BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 8, 2020 10:41:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9 EL C.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B8C(i3143)  
Specifier:  
Designer: LBV  
Company:



### Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 5-1/4"		82 / 0	55 / 0	
B2, 4"	91 / 0	118 / 0	71 / 0	

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	01-00-00	Top	1.00	0.65	1.00	1.15	00-00-00
1	E42(i2453)	Unf. Lin. (lb/ft)	L	00-02-08	01-00-00	Top		154	159		n/a
2	-	Conc. Pt. (lbs)	L	00-06-13	00-06-13	Top	91	69			n/a

### Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	7 ft-lbs	23220 ft-lbs	n/a	13	00-06-10
End Shear	51 lbs	11571 lbs	0.4%	13	00-05-04
Span / Depth	0.4				

### Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Beam 5-1/4" x 3-1/2"	185 lbs	2.4%	0.8%	Unspecified
B2	Hanger 4" x 3-1/2"	356 lbs	n/a	2.1%	HGUS410

### Cautions

Header for the hanger HGUS410 is a Triple 1-3/4" x 9-1/2" LVL Beam.  
Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

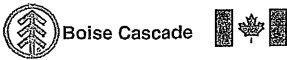
### Notes

Calculations assume member is fully braced.  
Hanger Manufacturer: Unassigned  
Resistance Factor phi has been applied to all presented results per CSA O86.  
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.  
Unbalanced snow loads determined from building geometry were used in selected product's verification.  
Design based on Dry Service Condition.  
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020





**Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP**  
**2ND FLR FRAMING\Flush Beams\B8C(i3143) (Flush Beam)**

**PASSED**

BC CALC® Member Report  
Build 7493

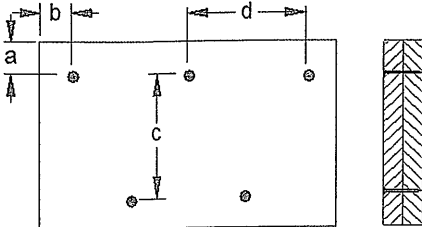
Dry | 1 span | No cant.

October 8, 2020 10:41:48

Job name:  
Address:  
City, Province, Postal Code: RICHMOND HILL  
Customer:  
Code reports: CCMC 12472-R

File name: 38-9 EL C.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B8C(i3143)  
Specifier:  
Designer: LBV  
Company:

**Connection Diagram: Full Length of Member**



a minimum = 2"      c = 5-1/2"  
b minimum = 3"      d = 4"

Calculated Side Load = 96.4 lb/ft

Connectors are: 1 Nails  
**3-1/2" ARDOX SPIRAL**



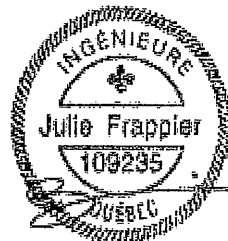
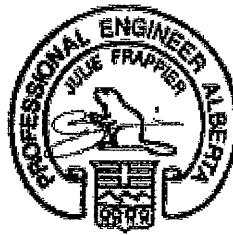
**STRUCTURAL  
COMPONENT ONLY**

**Disclosure**

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

Per: Michael Devitt

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,



## Maximum Floor Spans

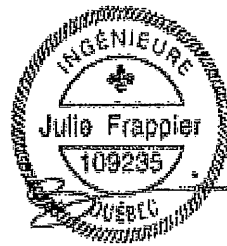
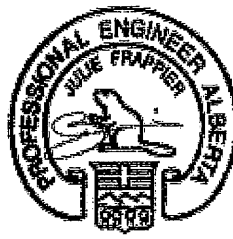
Live Load = 40 psf, Dead Load = 15 psf  
Simple Spans, L/480 Deflection Limit  
5/8" OSB G&N Sheathing

Depth	Series	Bare				1/2" Gypsum Ceiling			
		On Centre Spacing				On Centre Spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-1"	14'-2"	13'-9"	N/A	15'-7"	14'-8"	14'-2"	N/A
	NI-40x	16'-1"	15'-2"	14'-8"	N/A	16'-7"	15'-7"	15'-1"	N/A
	NI-60	16'-3"	15'-4"	14'-10"	N/A	16'-8"	15'-9"	15'-3"	N/A
	NI-70	17'-1"	16'-1"	15'-6"	N/A	17'-5"	16'-5"	15'-10"	N/A
	NI-80	17'-3"	16'-3"	15'-8"	N/A	17'-8"	16'-7"	16'-0"	N/A
11-7/8"	NI-20	16'-11"	16'-0"	15'-5"	N/A	17'-6"	16'-6"	16'-0"	N/A
	NI-40x	18'-1"	17'-0"	16'-5"	N/A	18'-9"	17'-6"	16'-11"	N/A
	NI-60	18'-4"	17'-3"	16'-7"	N/A	19'-0"	17'-8"	17'-1"	N/A
	NI-70	19'-6"	18'-0"	17'-4"	N/A	20'-1"	18'-7"	17'-9"	N/A
	NI-80	19'-9"	18'-3"	17'-6"	N/A	20'-4"	18'-10"	17'-11"	N/A
14"	NI-90x	20'-4"	18'-9"	17'-11"	N/A	20'-10"	19'-3"	18'-5"	N/A
	NI-40x	20'-1"	18'-7"	17'-10"	N/A	20'-10"	19'-4"	18'-6"	N/A
	NI-60	20'-5"	18'-11"	18'-1"	N/A	21'-2"	19'-7"	18'-9"	N/A
	NI-70	21'-7"	20'-0"	19'-1"	N/A	22'-3"	20'-7"	19'-8"	N/A
	NI-80	21'-11"	20'-3"	19'-4"	N/A	22'-7"	20'-11"	20'-0"	N/A
16"	NI-90x	22'-7"	20'-11"	19'-11"	N/A	23'-3"	21'-6"	20'-6"	N/A
	NI-60	22'-3"	20'-8"	19'-9"	N/A	23'-1"	21'-5"	20'-6"	N/A
	NI-70	23'-6"	21'-9"	20'-9"	N/A	24'-3"	22'-5"	21'-5"	N/A
	NI-80	23'-11"	22'-1"	21'-1"	N/A	24'-8"	22'-10"	21'-9"	N/A
	NI-90x	24'-8"	22'-9"	21'-9"	N/A	25'-4"	23'-5"	22'-4"	N/A

Depth	Series	Mid-Span Blocking				Mid-Span Blocking and 1/2" Gypsum Ceiling			
		On Centre Spacing				On Centre Spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	16'-8"	15'-3"	14'-5"	N/A	16'-8"	15'-3"	14'-5"	N/A
	NI-40x	17'-11"	16'-11"	16'-1"	N/A	18'-5"	17'-1"	16'-1"	N/A
	NI-60	18'-2"	17'-1"	16'-4"	N/A	18'-7"	17'-4"	16'-4"	N/A
	NI-70	19'-2"	17'-10"	17'-2"	N/A	19'-7"	18'-3"	17'-7"	N/A
	NI-80	19'-5"	18'-0"	17'-4"	N/A	19'-10"	18'-5"	17'-8"	N/A
11-7/8"	NI-20	19'-6"	18'-1"	17'-3"	N/A	19'-11"	18'-3"	17'-3"	N/A
	NI-40x	21'-0"	19'-6"	18'-8"	N/A	21'-7"	20'-2"	19'-2"	N/A
	NI-60	21'-4"	19'-9"	18'-11"	N/A	21'-11"	20'-4"	19'-6"	N/A
	NI-70	22'-6"	20'-10"	19'-11"	N/A	23'-0"	21'-5"	20'-5"	N/A
	NI-80	22'-9"	21'-1"	20'-1"	N/A	23'-3"	21'-7"	20'-8"	N/A
14"	NI-90x	23'-4"	21'-8"	20'-8"	N/A	23'-10"	22'-2"	21'-2"	N/A
	NI-40x	23'-7"	21'-11"	20'-11"	N/A	24'-3"	22'-7"	21'-7"	N/A
	NI-60	24'-0"	22'-3"	21'-3"	N/A	24'-8"	22'-11"	21'-11"	N/A
	NI-70	25'-3"	23'-4"	22'-3"	N/A	25'-10"	24'-0"	22'-11"	N/A
	NI-80	25'-7"	23'-8"	22'-7"	N/A	26'-2"	24'-4"	23'-2"	N/A
16"	NI-90x	26'-4"	24'-4"	23'-3"	N/A	26'-10"	24'-11"	23'-9"	N/A
	NI-60	26'-5"	24'-6"	23'-4"	N/A	27'-2"	25'-3"	24'-2"	N/A
	NI-70	27'-9"	25'-8"	24'-6"	N/A	28'-5"	26'-5"	25'-2"	N/A
	NI-80	28'-2"	26'-1"	24'-10"	N/A	28'-10"	26'-9"	25'-6"	N/A
	NI-90x	29'-0"	26'-10"	25'-7"	N/A	29'-7"	27'-5"	26'-2"	N/A

- Maximum clear span applicable to simple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration, a live load deflection limit of L/480 and a total load deflection limit of L/240.
- Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for a joist spacing of 19.2 inches or less. The composite floor may include 1/2 inch gypsum ceiling and/or one row of blocking at mid-span with strapping. Strapping shall be minimum 1x4 inch strap applied to underside of joists at blocking line or 1/2 inch gypsum ceiling attached to joists.
- Minimum bearing length shall be 1-3/4 inches for the end bearings.
- Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
- This span chart is based on uniform loads. For applications with other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties. Tables are based on Limit States Design per CSA O86-09, NBC 2010, and OBC 2012.
- Joists shall be laterally supported at supports and continuously along the compression edge. Refer to technical documentation for installation guidelines and construction details. Nordic I-joists are listed in CCMC evaluation report 13032-R and APA Product Report PR-L274C.

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## Maximum Floor Spans

Live Load = 40 psf, Dead Load = 15 psf  
Simple Spans, L/480 Deflection Limit  
3/4" OSB G&N Sheathing

Depth	Series	Bare				1/2" Gypsum Ceiling			
		On Centre Spacing				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	17'-0"	16'-0"	15'-5"	14'-9"	17'-5"	16'-5"	15'-10"	15'-2"
	NI-60	17'-2"	16'-2"	15'-7"	14'-11"	17'-6"	16'-7"	15'-11"	15'-3"
	NI-70	18'-0"	16'-11"	16'-3"	15'-7"	18'-5"	17'-3"	16'-7"	15'-11"
	NI-80	18'-3"	17'-1"	16'-5"	15'-9"	18'-8"	17'-5"	16'-9"	16'-1"
11-7/8"	NI-20	17'-10"	16'-10"	16'-2"	15'-6"	18'-6"	17'-4"	16'-9"	16'-1"
	NI-40x	19'-4"	17'-11"	17'-3"	16'-6"	19'-11"	18'-6"	17'-9"	17'-0"
	NI-60	19'-7"	18'-2"	17'-5"	16'-9"	20'-2"	18'-9"	17'-11"	17'-2"
	NI-70	20'-9"	19'-2"	18'-3"	17'-5"	21'-4"	19'-9"	18'-10"	17'-10"
	NI-80	21'-1"	19'-5"	18'-6"	17'-7"	21'-7"	20'-0"	19'-0"	18'-0"
	NI-90x	21'-8"	20'-0"	19'-1"	18'-0"	22'-2"	20'-6"	19'-6"	18'-6"
14"	NI-40x	21'-5"	19'-10"	18'-11"	17'-11"	22'-1"	20'-6"	19'-7"	18'-7"
	NI-60	21'-10"	20'-2"	19'-3"	18'-2"	22'-5"	20'-10"	19'-11"	18'-10"
	NI-70	23'-0"	21'-3"	20'-3"	19'-2"	23'-8"	21'-11"	20'-10"	19'-9"
	NI-80	23'-5"	21'-7"	20'-7"	19'-5"	24'-0"	22'-3"	21'-2"	20'-0"
	NI-90x	24'-1"	22'-3"	21'-2"	20'-0"	24'-8"	22'-10"	21'-9"	20'-7"
16"	NI-60	23'-9"	22'-0"	20'-11"	19'-10"	24'-6"	22'-9"	21'-8"	20'-6"
	NI-70	25'-1"	23'-2"	22'-0"	20'-10"	25'-9"	23'-10"	22'-9"	21'-6"
	NI-80	25'-6"	23'-6"	22'-4"	21'-2"	26'-1"	24'-2"	23'-1"	21'-10"
	NI-90x	26'-4"	24'-3"	23'-1"	21'-10"	26'-11"	24'-11"	23'-8"	22'-5"

Depth	Series	Mid-Span Blocking				Mid-Span Blocking and 1/2" Gypsum Ceiling			
		On Centre Spacing				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-70	20'-0"	18'-7"	17'-9"	16'-7"	20'-5"	18'-11"	17'-10"	16'-7"
	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'-7"	18'-4"	22'-8"	20'-10"	19'-8"	18'-4"
	NI-70	23'-4"	21'-8"	20'-8"	19'-7"	23'-10"	22'-3"	21'-2"	19'-9"
	NI-80	23'-7"	21'-11"	20'-11"	19'-9"	24'-1"	22'-6"	21'-5"	20'-0"
	NI-90x	24'-3"	22'-6"	21'-6"	20'-4"	24'-8"	23'-0"	22'-0"	20'-9"
14"	NI-40x	24'-5"	22'-9"	21'-8"	19'-5"	25'-1"	23'-2"	21'-9"	19'-5"
	NI-60	24'-10"	23'-1"	22'-0"	20'-10"	25'-6"	23'-8"	22'-4"	20'-10"
	NI-70	26'-1"	24'-3"	23'-2"	21'-10"	26'-8"	24'-11"	23'-9"	22'-4"
	NI-80	26'-6"	24'-7"	23'-5"	22'-2"	27'-1"	25'-3"	24'-1"	22'-9"
	NI-90x	27'-3"	25'-4"	24'-1"	22'-9"	27'-9"	25'-11"	24'-8"	23'-4"
16"	NI-60	27'-3"	25'-5"	24'-2"	22'-10"	28'-0"	26'-2"	24'-9"	23'-1"
	NI-70	28'-8"	26'-8"	25'-4"	23'-11"	29'-3"	27'-4"	26'-1"	24'-8"
	NI-80	29'-1"	27'-0"	25'-9"	24'-4"	29'-8"	27'-9"	26'-5"	25'-0"
	NI-90x	29'-11"	27'-10"	26'-6"	25'-0"	30'-6"	28'-5"	27'-2"	25'-8"

1. Maximum clear span applicable to simple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration, a live load deflection limit of L/480 and a total load deflection limit of L/240.

2. Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 3/4 inch for a joist spacing of 24 inches or less. The composite floor may include 1/2 inch gypsum ceiling and/or one row of blocking at mid-span with strapping. Strapping shall be minimum 1x4 inch strap applied to underside of joists at blocking line or 1/2 inch gypsum ceiling attached to joists.

3. Minimum bearing length shall be 1-3/4 inches for the end bearings.

4. Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.

5. This span chart is based on uniform loads. For applications with other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties. Tables are based on Limit States Design per CSA O86-09, NBC 2010, and OBC 2012.

6. Joists shall be laterally supported at supports and continuously along the compression edge. Refer to technical documentation for installation guidelines and construction details. Nordic I-joists are listed in CCMC evaluation report 13032-R and APA Product Report PR-L274C.

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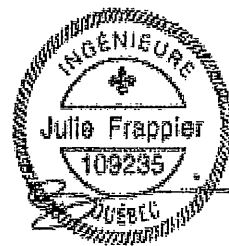
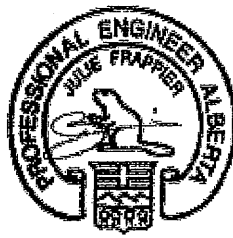
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## Maximum Floor Spans

Live Load = 40 psf, Dead Load = 30 psf  
Simple Spans, L/480 Deflection Limit  
5/8" OSB G&N Sheathing



Depth	Series	Bare				1/2" Gypsum Ceiling			
		On Centre Spacing				On Centre Spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-1"	14'-1"	13'-3"	N/A	15'-7"	14'-1"	13'-3"	N/A
	NI-40x	16'-1"	15'-2"	14'-8"	N/A	16'-7"	15'-7"	15'-1"	N/A
	NI-60	16'-3"	15'-4"	14'-10"	N/A	16'-8"	15'-9"	15'-3"	N/A
	NI-70	17'-1"	16'-1"	15'-6"	N/A	17'-5"	16'-5"	15'-10"	N/A
	NI-80	17'-3"	16'-3"	15'-8"	N/A	17'-8"	16'-7"	16'-0"	N/A
11-7/8"	NI-20	16'-11"	16'-0"	15'-5"	N/A	17'-6"	16'-6"	16'-0"	N/A
	NI-40x	18'-1"	17'-0"	16'-5"	N/A	18'-9"	17'-6"	16'-11"	N/A
	NI-60	18'-4"	17'-3"	16'-7"	N/A	19'-0"	17'-8"	17'-1"	N/A
	NI-70	19'-6"	18'-0"	17'-4"	N/A	20'-1"	18'-7"	17'-9"	N/A
	NI-80	19'-9"	18'-3"	17'-6"	N/A	20'-4"	18'-10"	17'-11"	N/A
14"	NI-90x	20'-4"	18'-9"	17'-11"	N/A	20'-10"	19'-3"	18'-5"	N/A
	NI-40x	20'-1"	18'-7"	17'-10"	N/A	20'-10"	19'-4"	18'-6"	N/A
	NI-60	20'-5"	18'-11"	18'-1"	N/A	21'-2"	19'-7"	18'-9"	N/A
	NI-70	21'-7"	20'-0"	19'-1"	N/A	22'-3"	20'-7"	19'-8"	N/A
	NI-80	21'-11"	20'-3"	19'-4"	N/A	22'-7"	20'-11"	20'-0"	N/A
16"	NI-90x	22'-7"	20'-11"	19'-11"	N/A	23'-3"	21'-6"	20'-6"	N/A
	NI-60	22'-3"	20'-8"	19'-9"	N/A	23'-1"	21'-5"	20'-6"	N/A
	NI-70	23'-6"	21'-9"	20'-9"	N/A	24'-3"	22'-5"	21'-5"	N/A
	NI-80	23'-11"	22'-1"	21'-1"	N/A	24'-8"	22'-10"	21'-9"	N/A
	NI-90x	24'-8"	22'-9"	21'-9"	N/A	25'-4"	23'-5"	22'-4"	N/A

Depth	Series	Mid-Span Blocking				Mid-Span Blocking and 1/2" Gypsum Ceiling			
		On Centre Spacing				On Centre Spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-7"	14'-1"	13'-3"	N/A	15'-7"	14'-1"	13'-3"	N/A
	NI-40x	17'-9"	16'-1"	15'-1"	N/A	17'-9"	16'-1"	15'-1"	N/A
	NI-60	18'-1"	16'-4"	15'-4"	N/A	18'-1"	16'-4"	15'-4"	N/A
	NI-70	19'-2"	17'-10"	16'-9"	N/A	19'-7"	17'-10"	16'-9"	N/A
	NI-80	19'-5"	18'-0"	17'-1"	N/A	19'-10"	18'-3"	17'-1"	N/A
11-7/8"	NI-20	18'-9"	17'-0"	16'-0"	N/A	18'-9"	17'-0"	16'-0"	N/A
	NI-40x	21'-0"	19'-3"	17'-9"	N/A	21'-3"	19'-3"	17'-9"	N/A
	NI-60	21'-4"	19'-8"	18'-5"	N/A	21'-8"	19'-8"	18'-5"	N/A
	NI-70	22'-6"	20'-10"	19'-11"	N/A	23'-0"	21'-4"	20'-0"	N/A
	NI-80	22'-9"	21'-1"	20'-1"	N/A	23'-3"	21'-7"	20'-5"	N/A
14"	NI-90x	23'-4"	21'-8"	20'-8"	N/A	23'-10"	22'-2"	21'-2"	N/A
	NI-40x	23'-7"	21'-5"	19'-6"	N/A	24'-1"	21'-5"	19'-6"	N/A
	NI-60	24'-0"	22'-3"	21'-0"	N/A	24'-8"	22'-5"	21'-0"	N/A
	NI-70	25'-3"	23'-4"	22'-3"	N/A	25'-10"	24'-0"	22'-9"	N/A
	NI-80	25'-7"	23'-8"	22'-7"	N/A	26'-2"	24'-4"	23'-2"	N/A
16"	NI-90x	26'-4"	24'-4"	23'-3"	N/A	26'-10"	24'-11"	23'-9"	N/A
	NI-60	26'-5"	24'-6"	23'-4"	N/A	27'-2"	24'-10"	23'-4"	N/A
	NI-70	27'-9"	25'-8"	24'-6"	N/A	28'-5"	26'-5"	25'-2"	N/A
	NI-80	28'-2"	26'-1"	24'-10"	N/A	28'-10"	26'-9"	25'-6"	N/A
	NI-90x	29'-0"	26'-10"	25'-7"	N/A	29'-7"	27'-5"	26'-2"	N/A

1. Maximum clear span applicable to simple-span residential floor construction with a design live load of 40 psf and dead load of 30 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration, a live load deflection limit of L/480 and a total load deflection limit of L/240.

2. Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for a joist spacing of 19.2 inches or less. The composite floor may include 1/2 inch gypsum ceiling and/or one row of blocking at mid-span with strapping. Strapping shall be minimum 1x4 inch strap applied to underside of joists at blocking line or 1/2 inch gypsum ceiling attached to joists.

3. Minimum bearing length shall be 1-3/4 inches for the end bearings.

4. Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.

5. This span chart is based on uniform loads. For applications with other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties. Tables are based on Limit States Design per CSA O86-09, NBC 2010, and OBC 2012.

6. Joists shall be laterally supported at supports and continuously along the compression edge. Refer to technical documentation for installation guidelines and construction details. Nordic I-joists are listed in CCMC evaluation report 13032-R and APA Product Report PR-L274C.

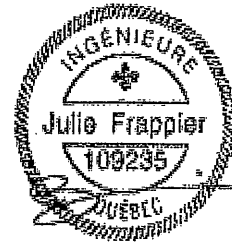
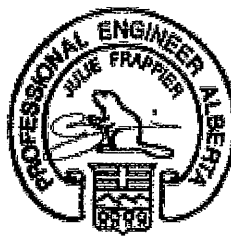
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## Maximum Floor Spans

Live Load = 40 psf, Dead Load = 30 psf  
Simple Spans, L/480 Deflection Limit  
3/4" OSB G&N Sheathing



Depth	Series	Bare				1/2" Gypsum Ceiling			
		On Centre Spacing				On Centre Spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-7"	14'-2"	13'-4"	12'-4"	15'-7"	14'-2"	13'-4"	12'-4"
	NI-40x	17'-0"	16'-0"	15'-1"	13'-11"	17'-5"	16'-1"	15'-1"	13'-11"
	NI-60	17'-2"	16'-2"	15'-5"	14'-3"	17'-6"	16'-5"	15'-5"	14'-3"
	NI-70	18'-0"	16'-11"	16'-3"	15'-6"	18'-5"	17'-3"	16'-7"	15'-6"
	NI-80	18'-3"	17'-1"	16'-5"	15'-9"	18'-8"	17'-5"	16'-9"	15'-10"
11-7/8"	NI-20	17'-10"	16'-10"	16'-0"	14'-10"	18'-6"	17'-1"	16'-0"	14'-10"
	NI-40x	19'-4"	17'-11"	17'-3"	15'-10"	19'-11"	18'-6"	17'-9"	15'-10"
	NI-60	19'-7"	18'-2"	17'-5"	16'-9"	20'-2"	18'-9"	17'-11"	17'-1"
	NI-70	20'-9"	19'-2"	18'-3"	17'-5"	21'-4"	19'-9"	18'-10"	17'-10"
	NI-80	21'-1"	19'-5"	18'-6"	17'-7"	21'-7"	20'-0"	19'-0"	18'-0"
14"	NI-90x	21'-8"	20'-0"	19'-1"	18'-0"	22'-2"	20'-6"	19'-6"	18'-6"
	NI-40x	21'-5"	19'-10"	18'-11"	17'-5"	22'-1"	20'-6"	19'-6"	17'-5"
	NI-60	21'-10"	20'-2"	19'-3"	18'-2"	22'-5"	20'-10"	19'-11"	18'-10"
	NI-70	23'-0"	21'-3"	20'-3"	19'-2"	23'-8"	21'-11"	20'-10"	19'-9"
	NI-80	23'-5"	21'-7"	20'-7"	19'-5"	24'-0"	22'-3"	21'-2"	20'-0"
16"	NI-90x	24'-1"	22'-3"	21'-2"	20'-0"	24'-8"	22'-10"	21'-9"	20'-7"
	NI-60	23'-9"	22'-0"	20'-11"	19'-10"	24'-6"	22'-9"	21'-8"	20'-6"
	NI-70	25'-1"	23'-2"	22'-0"	20'-10"	25'-9"	23'-10"	22'-9"	21'-6"
	NI-80	25'-6"	23'-6"	22'-4"	21'-2"	26'-1"	24'-2"	23'-1"	21'-10"
	NI-90x	26'-4"	24'-3"	23'-1"	21'-10"	26'-11"	24'-11"	23'-8"	22'-5"

Depth	Series	Mid-Span Blocking				Mid-Span Blocking and 1/2" Gypsum Ceiling			
		On Centre Spacing				On Centre Spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-7"	14'-2"	13'-4"	12'-4"	15'-7"	14'-2"	13'-4"	12'-4"
	NI-40x	17'-9"	16'-1"	15'-1"	13'-11"	17'-9"	16'-1"	15'-1"	13'-11"
	NI-60	18'-1"	16'-5"	15'-5"	14'-3"	18'-1"	16'-5"	15'-5"	14'-3"
	NI-70	19'-10"	17'-11"	16'-9"	15'-6"	19'-10"	17'-11"	16'-9"	15'-6"
	NI-80	20'-2"	18'-3"	17'-1"	15'-10"	20'-2"	18'-3"	17'-1"	15'-10"
11-7/8"	NI-20	18'-10"	17'-1"	16'-0"	14'-10"	18'-10"	17'-1"	16'-0"	14'-10"
	NI-40x	21'-3"	19'-3"	17'-9"	15'-10"	21'-3"	19'-3"	17'-9"	15'-10"
	NI-60	21'-9"	19'-8"	18'-5"	17'-1"	21'-9"	19'-8"	18'-5"	17'-1"
	NI-70	23'-4"	21'-5"	20'-1"	18'-6"	23'-8"	21'-5"	20'-1"	18'-6"
	NI-80	23'-7"	21'-10"	20'-5"	18'-11"	24'-1"	21'-10"	20'-5"	18'-11"
14"	NI-90x	24'-3"	22'-6"	21'-3"	19'-7"	24'-8"	22'-7"	21'-3"	19'-7"
	NI-40x	24'-2"	21'-5"	19'-6"	17'-5"	24'-2"	21'-5"	19'-6"	17'-5"
	NI-60	24'-9"	22'-5"	21'-0"	19'-6"	24'-9"	22'-5"	21'-0"	19'-6"
	NI-70	26'-1"	24'-3"	22'-9"	21'-0"	26'-8"	24'-3"	22'-9"	21'-0"
	NI-80	26'-6"	24'-7"	23'-3"	21'-6"	27'-1"	24'-10"	23'-3"	21'-6"
16"	NI-90x	27'-3"	25'-4"	24'-1"	22'-4"	27'-9"	25'-10"	24'-3"	22'-4"
	NI-60	27'-3"	24'-11"	23'-5"	21'-7"	27'-6"	24'-11"	23'-5"	21'-7"
	NI-70	28'-8"	26'-8"	25'-3"	23'-4"	29'-3"	26'-11"	25'-3"	23'-4"
	NI-80	29'-1"	27'-0"	25'-9"	23'-10"	29'-8"	27'-6"	25'-10"	23'-10"
	NI-90x	29'-11"	27'-10"	26'-6"	24'-10"	30'-6"	28'-5"	26'-11"	24'-10"

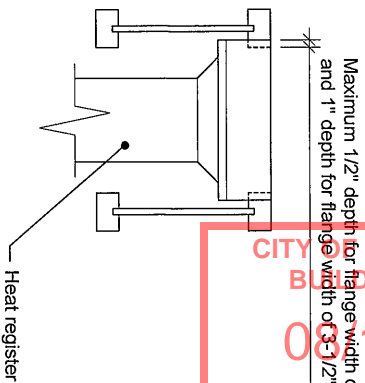
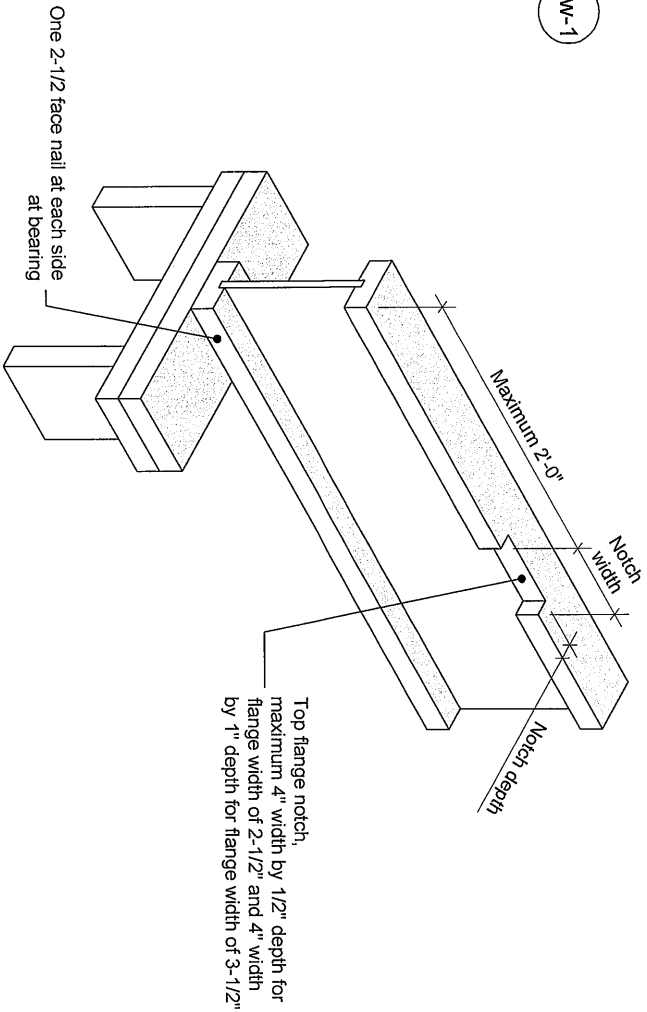
- Maximum clear span applicable to simple-span residential floor construction with a design live load of 40 psf and dead load of 30 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration, a live load deflection limit of L/480 and a total load deflection limit of L/240.
- Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 3/4 inch for a joist spacing of 24 inches or less. The composite floor may include 1/2 inch gypsum ceiling and/or one row of blocking at mid-span with strapping. Strapping shall be minimum 1x4 inch strap applied to underside of joists at blocking line or 1/2 inch gypsum ceiling attached to joists.
- Minimum bearing length shall be 1-3/4 inches for the end bearings.
- Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
- This span chart is based on uniform loads. For applications with other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties. Tables are based on Limit States Design per CSA O86-09, NBC 2010, and OBC 2012.
- Joists shall be laterally supported at supports and continuously along the compression edge. Refer to technical documentation for installation guidelines and construction details. Nordic I-joists are listed in CCMC evaluation report 13032-R and APA Product Report PR-L274C.

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- 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 width by 1/2-inch depth for flange width of 2-1/2 inches, and 4-inch width 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.

This document supersedes all previous versions. If the document has been in effect for more than one year, consult [nordic.ca](http://nordic.ca) or 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.

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TITLE  
Notch in I-joist for Heat Register  
CATEGORY  
I-joist - Typical Floor Framing and Construction Details

DOCUMENT  
DATE  
2018-04-10  
NUMBER  
1W-1



## Allowance for Piping (Installation Notes)

The floor layouts have usually not been checked for heating and/or plumbing interference. On-site adjustment of joists of up to 3 inches is permitted to avoid interferences. When moving a joist, the subfloor thickness shall be checked with code requirements when the joist spacing exceeds 19.2 inches. Except for cutting to length, I-joist flanges should never be cut, drilled, or notched.

Installation of Nordic I-joists shall be as per *Nordic Joist Installation Guide for Residential Floors*. Refer to Tables 1 and 2 for maximum web hole and duct chase openings, respectively. These tables are based on the I-joists being used at their maximum spans. The minimum distance given may be reduced for shorter spans; contact your distributor for additional information.

The detail below shows the 3-inch allowance for piping. Every third joist may be shifted up to 3 inches to avoid heating/plumbing interference. For other applications, please contact your distributor.

