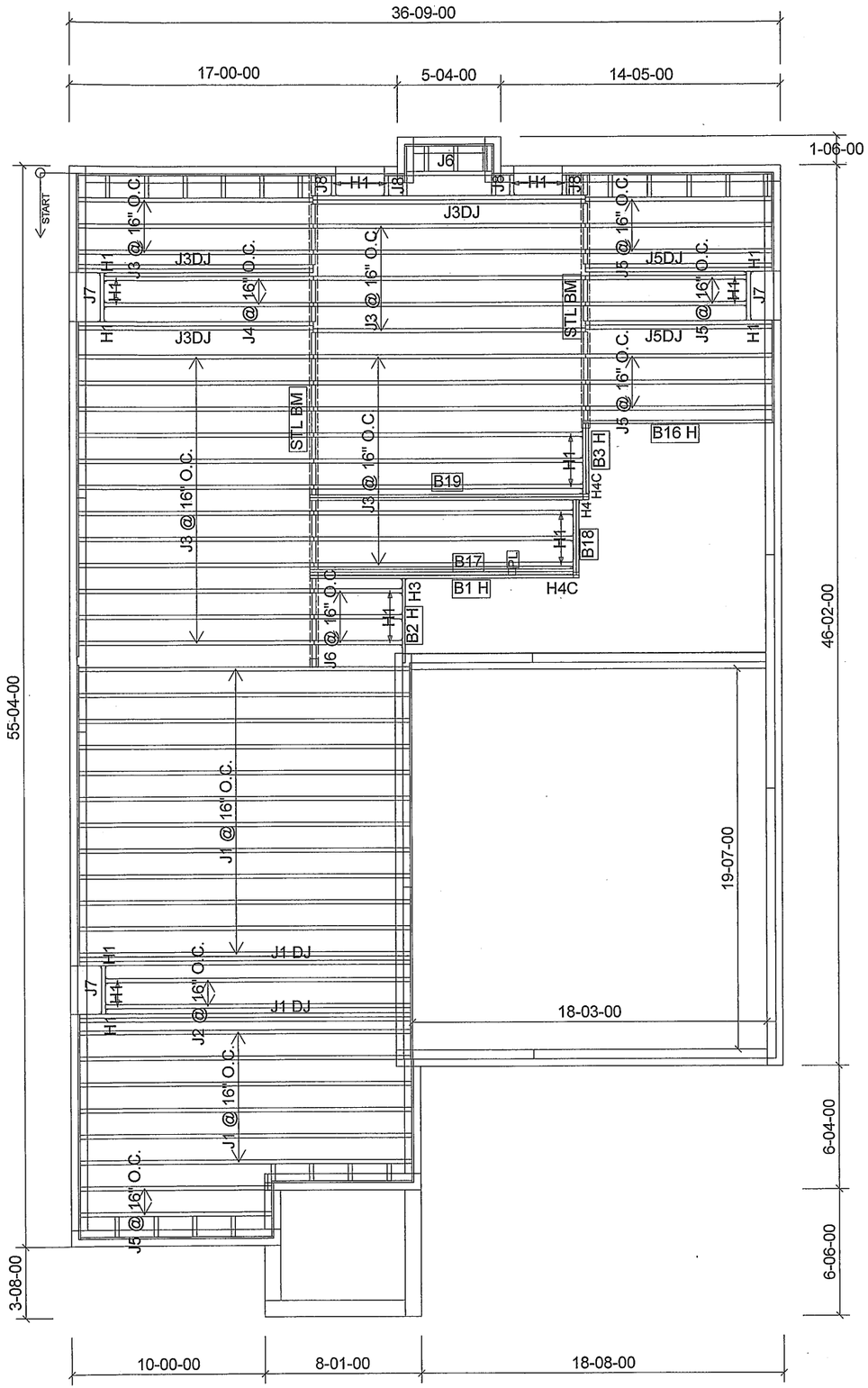



| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 18-00-00 | 11 7/8" NI-40x | 1 | 18 |
| J1 DJ | 18-00-00 | 11 7/8" NI-40x | 2 | 4 |
| J2 | 16-00-00 | 11 7/8" NI-40x | 1 | 2 |
| J3 | 14-00-00 | 11 7/8" NI-40x | 1 | 29 |
| J3DJ | 14-00-00 | 11 7/8" NI-40x | 2 | 6 |
| J4 | 12-00-00 | 11 7/8" NI-40x | 1 | 2 |
| J5 | 10-00-00 | 11 7/8" NI-40x | 1 | 10 |
| J5DJ | 10-00-00 | 11 7/8" NI-40x | 2 | 4 |
| J6 | 6-00-00 | 11 7/8" NI-40x | 1 | 4 |
| J7 | 4-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J8 | 2-00-00 | 11 7/8" NI-40x | 1 | 4 |
| B19 | 16-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B1 H | 14-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B17 | 14-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B16 H | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B2 H | 6-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B18 | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B3 H | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |

| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 6 | H1 | IUA2.56/11.88 |
| 3 | H1 | IUS2.56/11.88 |
| 10 | H1 | IUS2.56/11.88 |
| 6 | H1 | IUS2.56/11.88 |
| 1 | H3 | HUS1.81/10 |
| 2 | H4C | HUC410 |
| 1 | H4 | HGUS410 |

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

TAMARACK LUMBER INC
ALPA LUMBER GROUP

**FROM PLAN DATED: AUG 2020**

**BUILDER:** ROYAL PINE HOMES

**SITE:** WEST GORMLEY

**MODEL:** 4504

**ELEVATION:** A,B,C

**LOT:**

**CITY:** RICHMOND HILL

**SALESMAN:** MARIO DI CIANO
**DESIGNER:** L.D.
**REVISION:** lbv

**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 TIL** APPLICATION AS PER O.B.C 9.30.6.

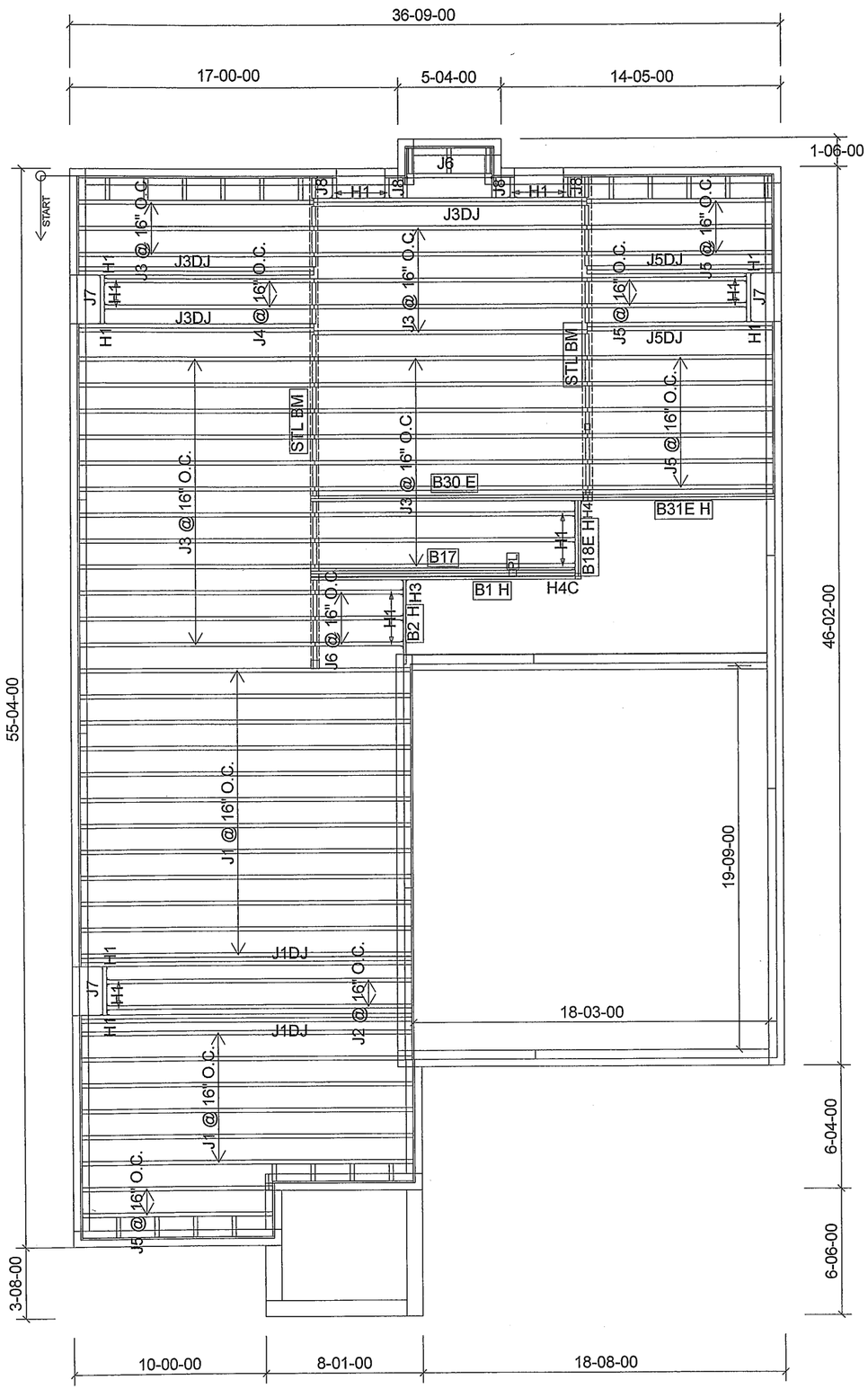
**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 20.0 lb/ft²

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

**DATE:** 2021-05-19

# 1st FLOOR

STANDARD




| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 18-00-00 | 11 7/8" NI-40x | 1 | 18 |
| J1DJ | 18-00-00 | 11 7/8" NI-40x | 2 | 4 |
| J2 | 16-00-00 | 11 7/8" NI-40x | 1 | 2 |
| J3 | 14-00-00 | 11 7/8" NI-40x | 1 | 29 |
| J3DJ | 14-00-00 | 11 7/8" NI-40x | 2 | 6 |
| J4 | 12-00-00 | 11 7/8" NI-40x | 1 | 2 |
| J5 | 10-00-00 | 11 7/8" NI-40x | 1 | 13 |
| J5DJ | 10-00-00 | 11 7/8" NI-40x | 2 | 4 |
| J6 | 6-00-00 | 11 7/8" NI-40x | 1 | 4 |
| J7 | 4-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J8 | 2-00-00 | 11 7/8" NI-40x | 1 | 4 |
| B30 E | 16-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B1 H | 14-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B17 | 14-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B31E H | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B2 H | 6-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B18E H | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |

| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 3 | H1 | IUS2.56/11.88 |
| 3 | H1 | IUS2.56/11.88 |
| 10 | H1 | IUS2.56/11.88 |
| 6 | H1 | IUS2.56/11.88 |
| 1 | H3 | HUS1.81/10 |
| 1 | H4C | HUC410 |
| 1 | H4 | HGUS410 |

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

TAMARACK LUMBER INC
ALPA LUMBER GROUP

**FROM PLAN DATED: AUG 2020**

**BUILDER:** ROYAL PINE HOMES

**SITE:** WEST GORMLEY

**MODEL:** 4504

**ELEVATION:** A,B,C

**LOT:**

**CITY:** RICHMOND HILL

**SALESMAN:** MARIO DI CIANO
**DESIGNER:** L.D.
**REVISION:** lbv

**NOTES:**
REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.
**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P 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** RI 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 T** APPLICATION AS PER O.B.C 9.30.6.

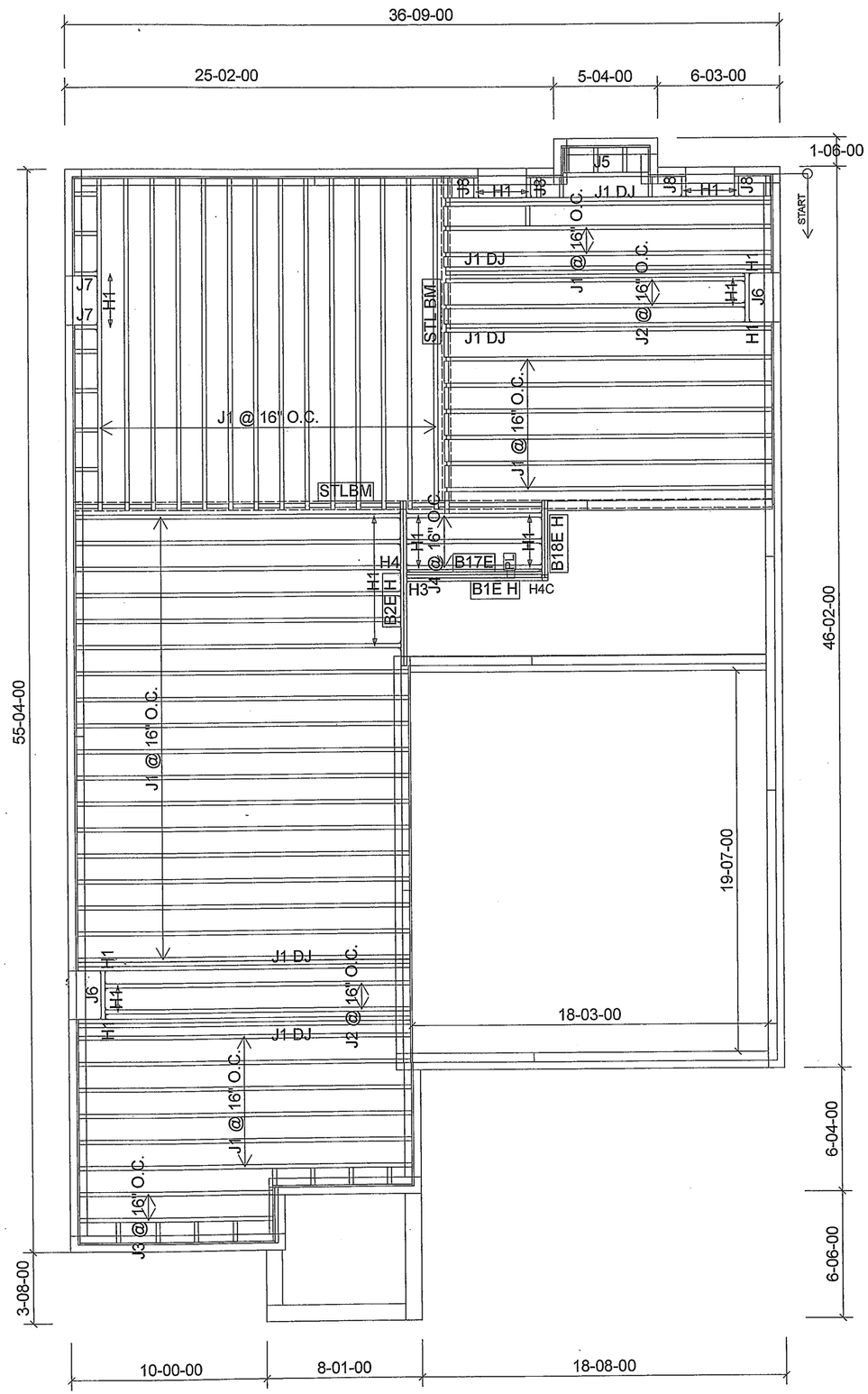
**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 20.0 lb/ft²

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

**DATE:** 2021-05-19

# 1st FLOOR

STANDARD
IN LAW SUITES




| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 18-00-00 | 11 7/8" NI-40x | 1 | 46 |
| J1 DJ | 18-00-00 | 11 7/8" NI-40x | 2 | 10 |
| J2 | 16-00-00 | 11 7/8" NI-40x | 1 | 4 |
| J3 | 10-00-00 | 11 7/8" NI-40x | 1 | 2 |
| J4 | 8-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J5 | 6-00-00 | 11 7/8" NI-40x | 1 | 1 |
| J6 | 4-00-00 | 11 7/8" NI-40x | 1 | 2 |
| J7 | 2-00-00 | 11 7/8" NI-40x | 1 | 2 |
| J8 | 2-00-00 | 11 7/8" NI-40x | 1 | 4 |
| B2E H | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B1E H | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B17E | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B18E H | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |

| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 12 | H1 | IUS2.56/11.88 |
| 8 | H1 | IUS2.56/11.88 |
| 6 | H1 | IUS2.56/11.88 |
| 1 | H3 | HUS1.81/10 |
| 1 | H4C | HUC410 |
| 1 | H4 | HGUS410 |

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

TAMARACK LUMBER INC
ALPA LUMBER GROUP

**FROM PLAN DATED: AUG 2020**

**BUILDER:** ROYAL PINE HOMES

**SITE:** WEST GORMLEY

**MODEL:** 4504

**ELEVATION:** A,B,C

**LOT:**

**CITY:** RICHMOND HILL

**SALESMAN:** MARIO DI CIANO
**DESIGNER:** L.D.
**REVISION:** lbv

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

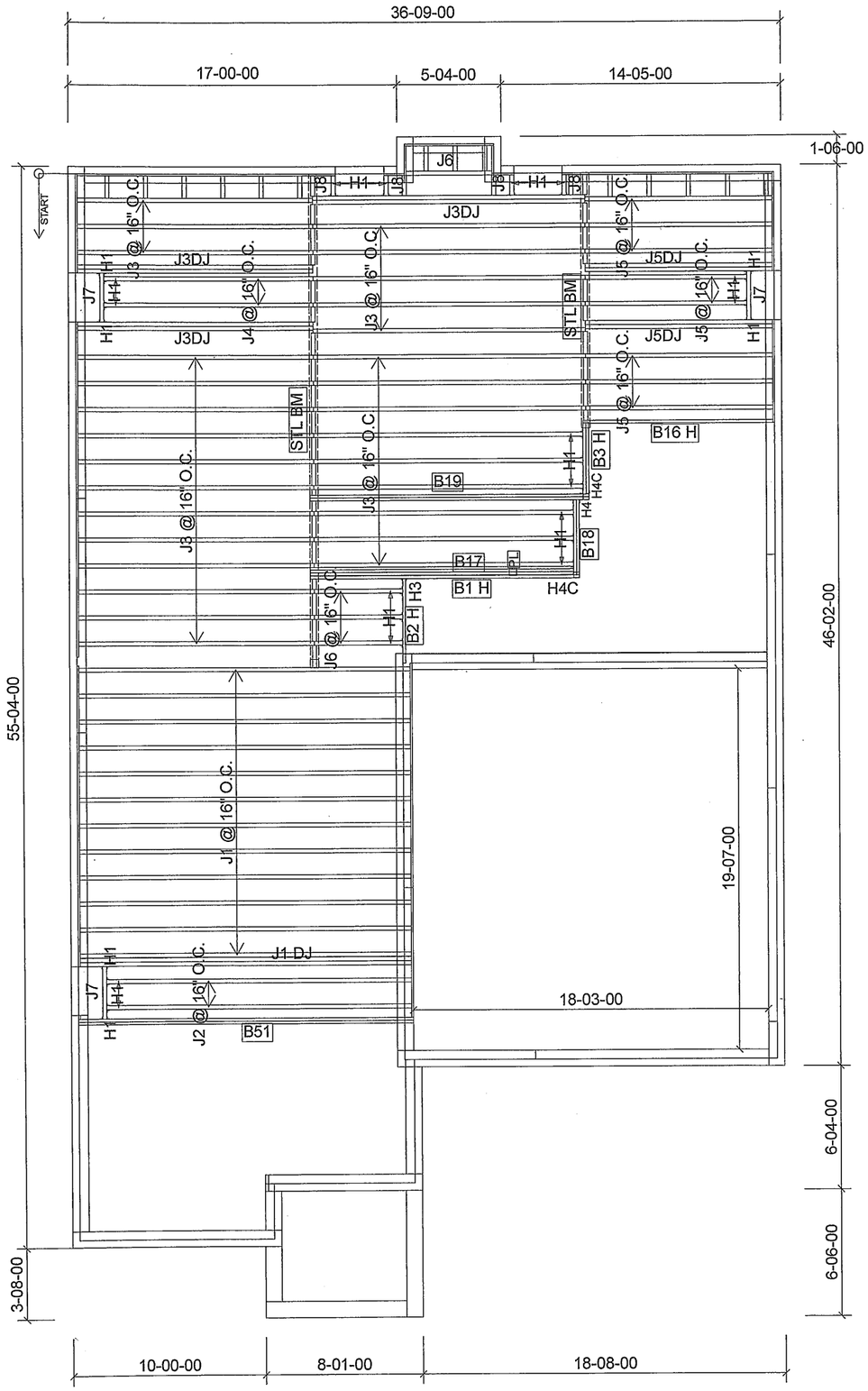
**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 20.0 lb/ft²

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

**DATE:** 2021-05-19

# 1st FLOOR

OPTION




| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 18-00-00 | 11 7/8" NI-40x | 1 | 12 |
| J1 DJ | 18-00-00 | 11 7/8" NI-40x | 2 | 2 |
| J2 | 16-00-00 | 11 7/8" NI-40x | 1 | 2 |
| J3 | 14-00-00 | 11 7/8" NI-40x | 1 | 29 |
| J3DJ | 14-00-00 | 11 7/8" NI-40x | 2 | 6 |
| J4 | 12-00-00 | 11 7/8" NI-40x | 1 | 2 |
| J5 | 10-00-00 | 11 7/8" NI-40x | 1 | 8 |
| J5DJ | 10-00-00 | 11 7/8" NI-40x | 2 | 4 |
| J6 | 6-00-00 | 11 7/8" NI-40x | 1 | 4 |
| J7 | 4-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J8 | 2-00-00 | 11 7/8" NI-40x | 1 | 4 |
| B51 | 18-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B19 | 16-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B1 H | 14-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B17 | 14-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B16 H | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B2 H | 6-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B18 | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B3 H | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |

| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 6 | H1 | IUA2.56/11.88 |
| 3 | H1 | IUS2.56/11.88 |
| 1 | H1 | IUS2.56/11.88 |
| 9 | H1 | IUS2.56/11.88 |
| 6 | H1 | IUS2.56/11.88 |
| 1 | H3 | HUS1.81/10 |
| 2 | H4C | HUC410 |
| 1 | H4 | HGUS410 |

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

TAMARACK LUMBER INC
ALPA LUMBER GROUP

**FROM PLAN DATED: AUG 2020**

**BUILDER:** ROYAL PINE HOMES

**SITE:** WEST GORMLEY

**MODEL:** 4504

**ELEVATION:** A,B,C

**LOT:**

**CITY:** RICHMOND HILL

**SALESMAN:** MARIO DI CIANO
**DESIGNER:** L.D.
**REVISION:** lbv

**NOTES:**
REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.
**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P. 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.

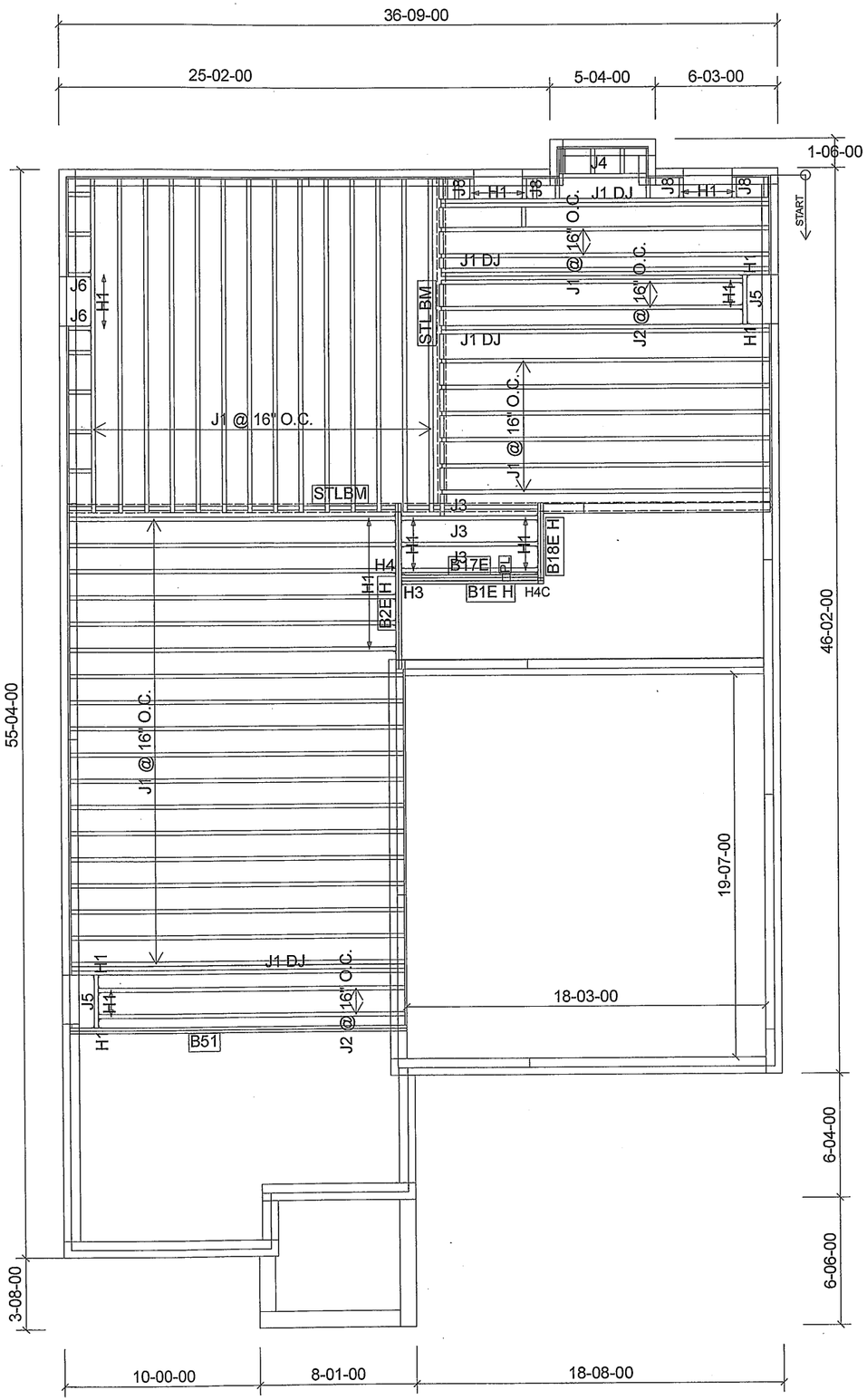
**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 20.0 lb/ft²

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

**DATE:** 2021-05-19

# 1st FLOOR

STANDARD
SUNKEN FOYER




| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 18-00-00 | 11 7/8" NI-40x | 1 | 40 |
| J1 DJ | 18-00-00 | 11 7/8" NI-40x | 2 | 8 |
| J2 | 16-00-00 | 11 7/8" NI-40x | 1 | 4 |
| J3 | 8-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J4 | 6-00-00 | 11 7/8" NI-40x | 1 | 1 |
| J5 | 4-00-00 | 11 7/8" NI-40x | 1 | 2 |
| J6 | 2-00-00 | 11 7/8" NI-40x | 1 | 2 |
| J8 | 2-00-00 | 11 7/8" NI-40x | 1 | 4 |
| B51 | 18-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B2E H | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B1E H | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B17E | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B18E H | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |

| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 13 | H1 | IUS2.56/11.88 |
| 7 | H1 | IUS2.56/11.88 |
| 6 | H1 | IUS2.56/11.88 |
| 1 | H3 | HUS1.81/10 |
| 1 | H4C | HUC410 |
| 1 | H4 | HGUS410 |

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

TAMARACK LUMBER INC
ALPA LUMBER GROUP

**FROM PLAN DATED: AUG 2020**

**BUILDER:** ROYAL PINE HOMES

**SITE:** WEST GORMLEY

**MODEL:** 4504

**ELEVATION:** A,B,C

**LOT:**

**CITY:** RICHMOND HILL

**SALESMAN:** MARIO DI CIANO
**DESIGNER:** L.D.
**REVISION:** lbv

**NOTES:**
REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.
**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P 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** R 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 T** APPLICATION AS PER O.B.C 9.30.6.

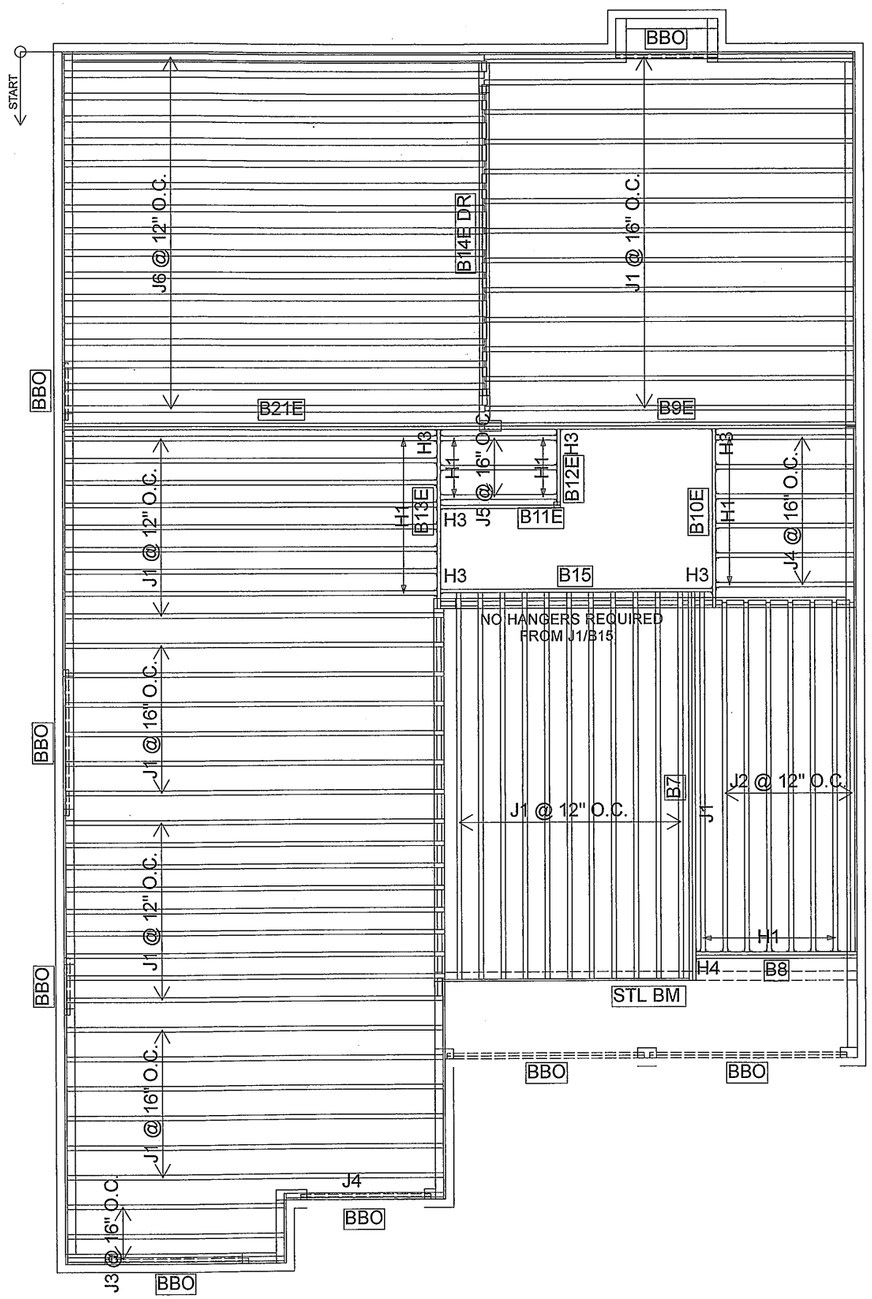
**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 20.0 lb/ft²

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

**DATE:** 2021-05-19

# 1st FLOOR

OPTION
SUNKEN FOYER




| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 18-00-00 | 11 7/8" NI-40x | 1 | 55 |
| J2 | 16-00-00 | 11 7/8" NI-40x | 1 | 7 |
| J3 | 10-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J4 | 8-00-00 | 11 7/8" NI-40x | 1 | 7 |
| J5 | 6-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J6 | 20-00-00 | 11 7/8" NI-80 | 1 | 17 |
| B7 | 18-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B9E | 18-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B15 | 14-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B14E DR | 14-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 3 | 3 |
| B10E | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B13E | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B8 | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B11E | 6-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B12E | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |

| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 20 | H1 | IUS2.56/11.88 |
| 7 | H1 | IUS2.56/11.88 |
| 3 | H3 | HUS1.81/10 |
| 3 | H3 | HUS1.81/10 |
| 1 | H4 | HGUS410 |

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

TAMARACK LUMBER INC
ALPA LUMBER GROUP

**FROM PLAN DATED: AUG 2020**

**BUILDER:** ROYAL PINE HOMES

**SITE:** WEST GORMLEY

**MODEL:** 4504

**ELEVATION:** A

**LOT:**

**CITY:** RICHMOND HILL

**SALESMAN:** MARIO DI CIANO
**DESIGNER:** L.D.
**REVISION: lbv**

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

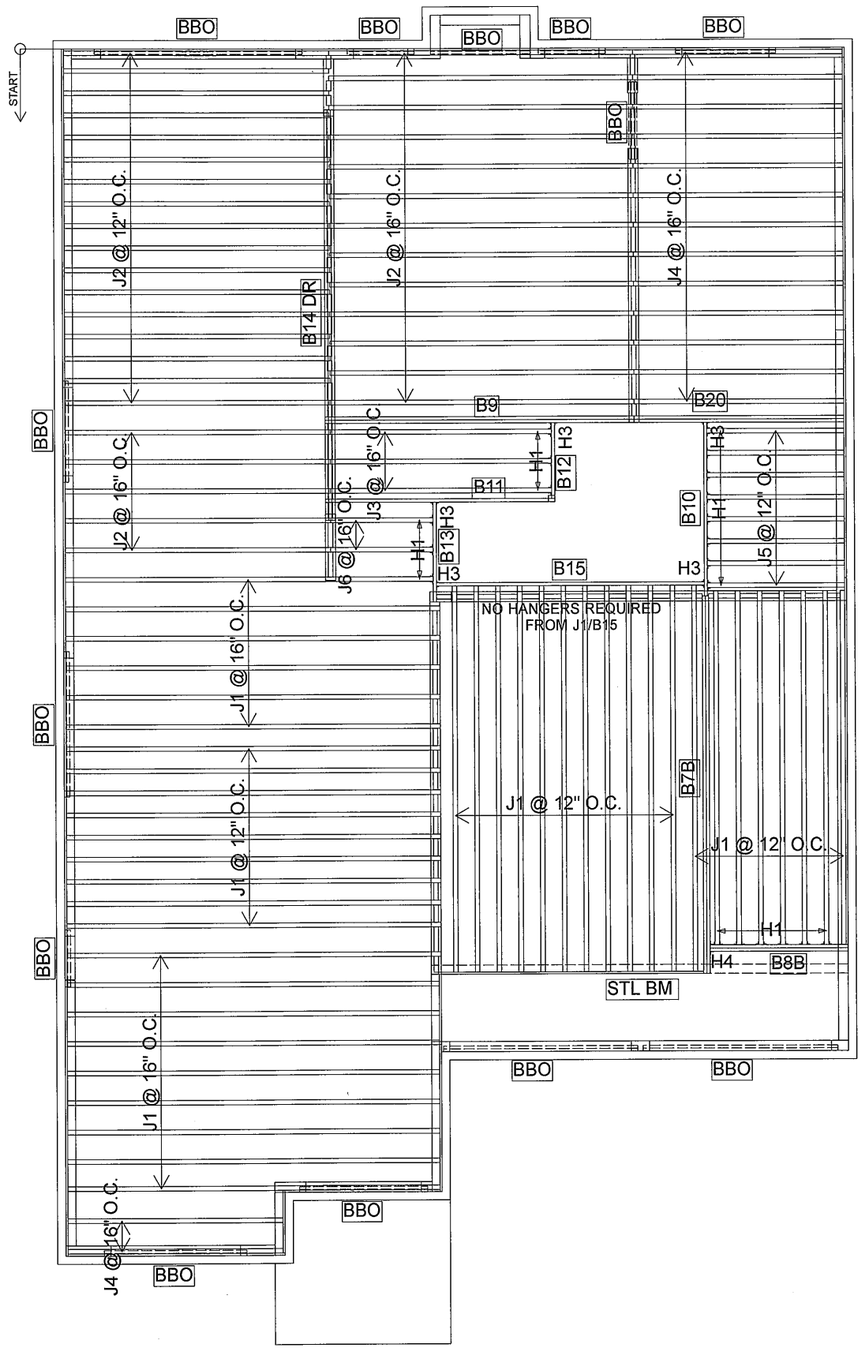
**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft $_2$
TILE LOAD: 20.0 lb/ft $_2$

**SUBFLOOR:** 5/8" GLUED AND NAILED

**DATE:** 2021-05-19

# 2ND FLOOR

OPTION
5 BEDROOM




| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 18-00-00 | 11 7/8" NI-40x | 1 | 43 |
| J2 | 14-00-00 | 11 7/8" NI-40x | 1 | 35 |
| J3 | 12-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J4 | 10-00-00 | 11 7/8" NI-40x | 1 | 15 |
| J5 | 8-00-00 | 11 7/8" NI-40x | 1 | 8 |
| J6 | 6-00-00 | 11 7/8" NI-40x | 1 | 2 |
| B7B | 18-00-00 | 1-3/4" x 11-7/8" 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 | 2 | 2 |
| B15 | 14-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B11 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
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| B8B | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B13 | 6-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B12 | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B14 DR | 20-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 3 | 3 |

| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 14 | H1 | IUS2.56/11.88 |
| 6 | H1 | IUS2.56/11.88 |
| 3 | H3 | HUS1.81/10 |
| 2 | H3 | HUS1.81/10 |
| 1 | H4 | HGUS410 |

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

TAMARACK LUMBER INC
ALPA LUMBER GROUP

**FROM PLAN DATED: AUG 2020**

**BUILDER:** ROYAL PINE HOMES

**SITE:** WEST GORMLEY

**MODEL:** 4504

**ELEVATION:** B

**LOT:**

**CITY:** RICHMOND HILL

**SALESMAN:** MARIO DI CIANO
**DESIGNER:** L.D.
**REVISION: lbv**

**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.

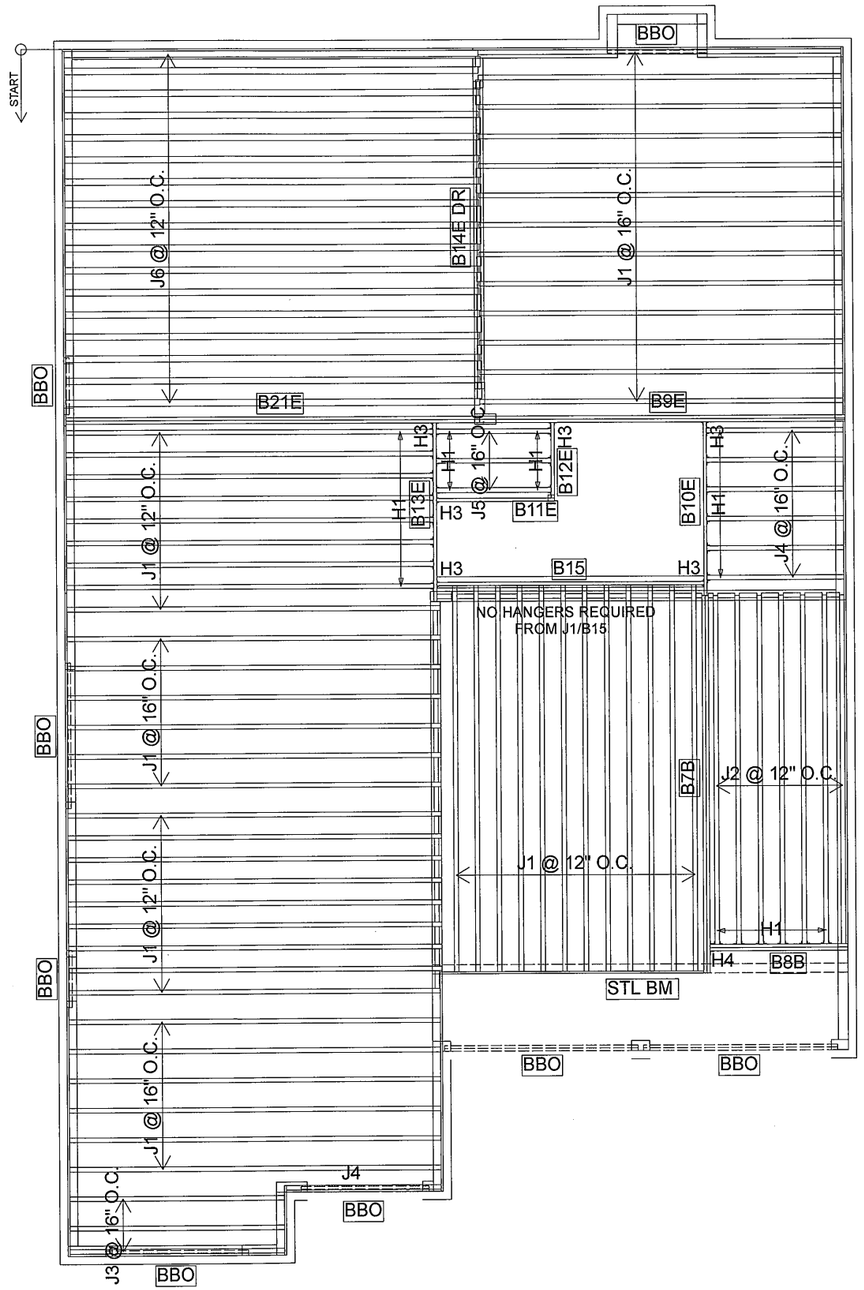
**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft $_2$
TILE LOAD: 20.0 lb/ft $_2$

**SUBFLOOR:** 5/8" GLUED AND NAILED

**DATE:** 2021-05-19

# 2ND FLOOR

STANDARD
4 BEDROOM




| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
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| J2 | 16-00-00 | 11 7/8" NI-40x | 1 | 7 |
| J3 | 10-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J4 | 8-00-00 | 11 7/8" NI-40x | 1 | 7 |
| J5 | 6-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J6 | 20-00-00 | 11 7/8" NI-80 | 1 | 17 |
| B7B | 18-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B9E | 18-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B15 | 14-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B14E DR | 14-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 3 | 3 |
| B13E | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
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|---|---|---|
| Qty | Manuf | Product |
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| 3 | H3 | HUS1.81/10 |
| 3 | H3 | HUS1.81/10 |
| 1 | H4 | HGUS410 |



TAMARACK LUMBER INC
ALPA LUMBER GROUP

**FROM PLAN DATED: AUG 2020**

**BUILDER:** ROYAL PINE HOMES

**SITE:** WEST GORMLEY

**MODEL:** 4504

**ELEVATION:** B

**LOT:**

**CITY:** RICHMOND HILL

**SALESMAN:** MARIO DI CIANO
**DESIGNER:** L.D.
**REVISION:** lbv

**NOTES:**
REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.
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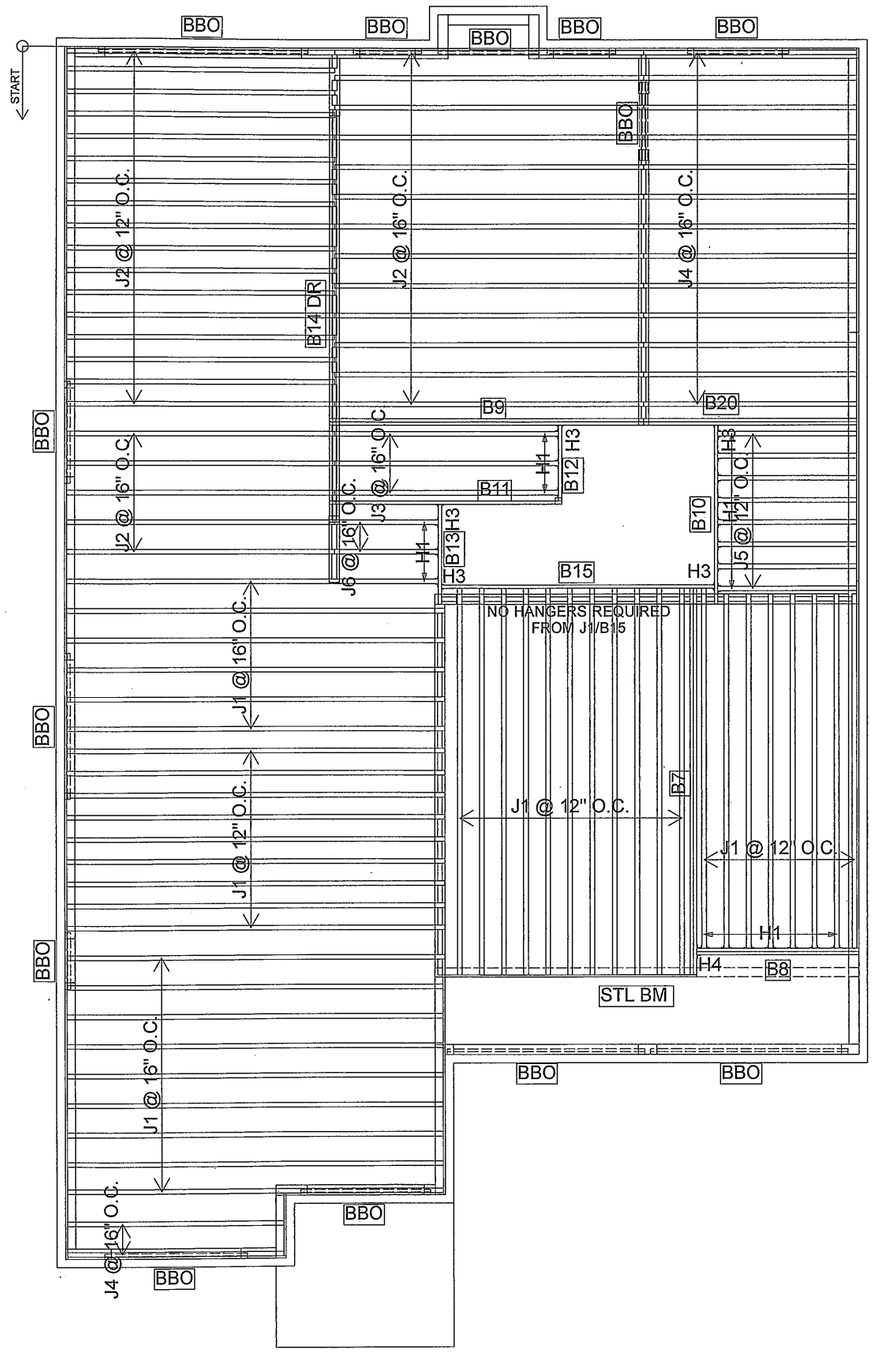
**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft $_2$
TILE LOAD: 20.0 lb/ft $_2$

**SUBFLOOR:** 5/8" GLUED AND NAILED

**DATE:** 2021-05-19

# 2ND FLOOR

OPTION
5 BEDROOM




| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 18-00-00 | 11 7/8" NI-40x | 1 | 43 |
| J2 | 14-00-00 | 11 7/8" NI-40x | 1 | 35 |
| J3 | 12-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J4 | 10-00-00 | 11 7/8" NI-40x | 1 | 15 |
| J5 | 8-00-00 | 11 7/8" NI-40x | 1 | 8 |
| J6 | 6-00-00 | 11 7/8" NI-40x | 1 | 2 |
| B7 | 18-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
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| B8 | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
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| 2 | H3 | HUS1.81/10 |
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CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
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Per:_____

TAMARACK LUMBER INC
ALPA LUMBER GROUP

**FROM PLAN DATED: AUG 2020**

**BUILDER:** ROYAL PINE HOMES

**SITE:** WEST GORMLEY

**MODEL:** 4504

**ELEVATION:** A

**LOT:**

**CITY:** RICHMOND HILL

**SALESMAN:** MARIO DI CIANO
**DESIGNER:** L.D.
**REVISION:** lbv

**NOTES:**
REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.
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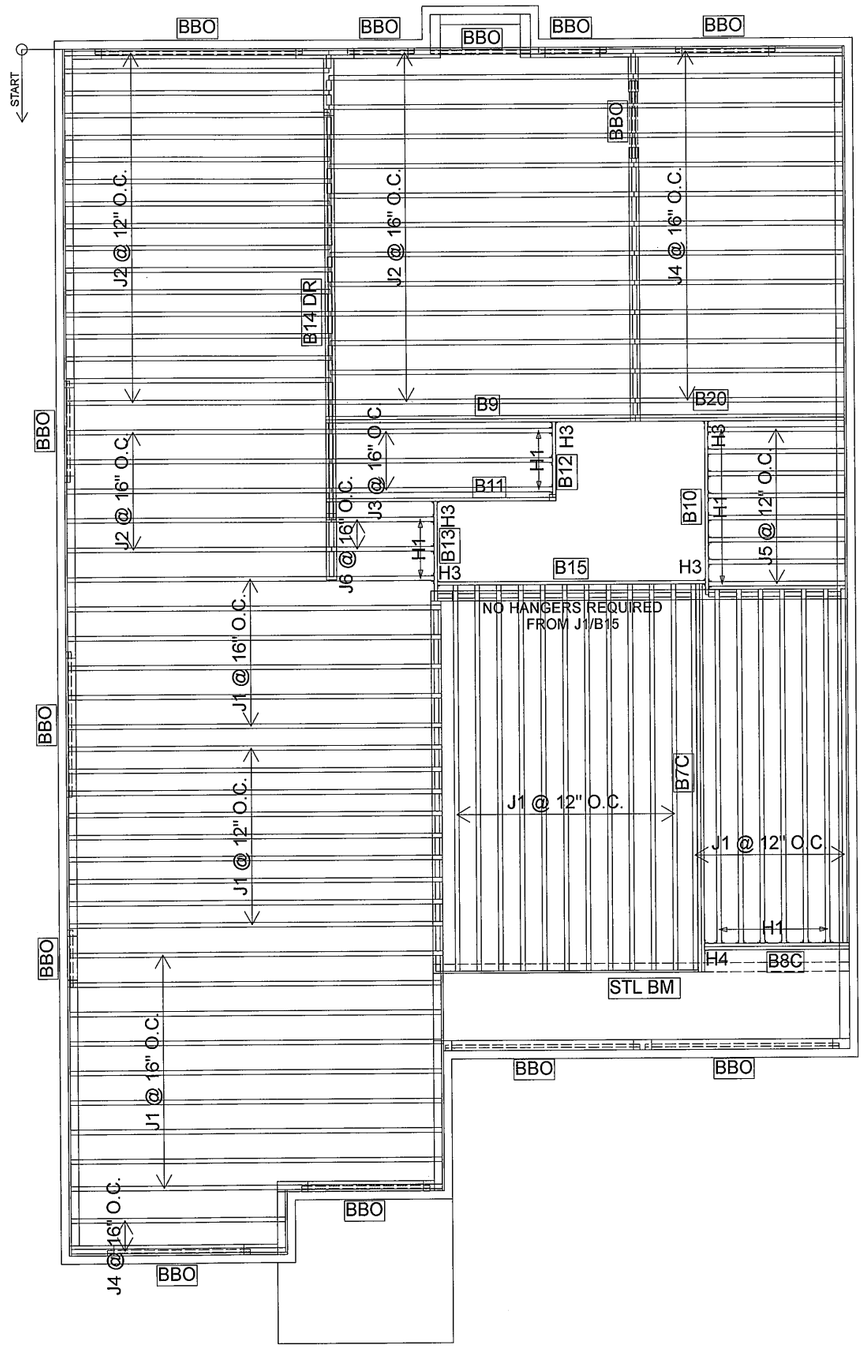
**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft $_2$
TILE LOAD: 20.0 lb/ft $_2$

**SUBFLOOR:** 5/8" GLUED AND NAILED

**DATE:** 2021-05-19

# 2ND FLOOR

STANDARD
4 BEDROOM

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TAMARACK LUMBER INC
ALPA LUMBER GROUP

**FROM PLAN DATED: AUG 2020**

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**SITE:** WEST GORMLEY

**MODEL:** 4504

**ELEVATION:** C

**LOT:**

**CITY:** RICHMOND HILL

**SALESMAN:** MARIO DI CIANO
**DESIGNER:** L.D.
**REVISION:** lbv

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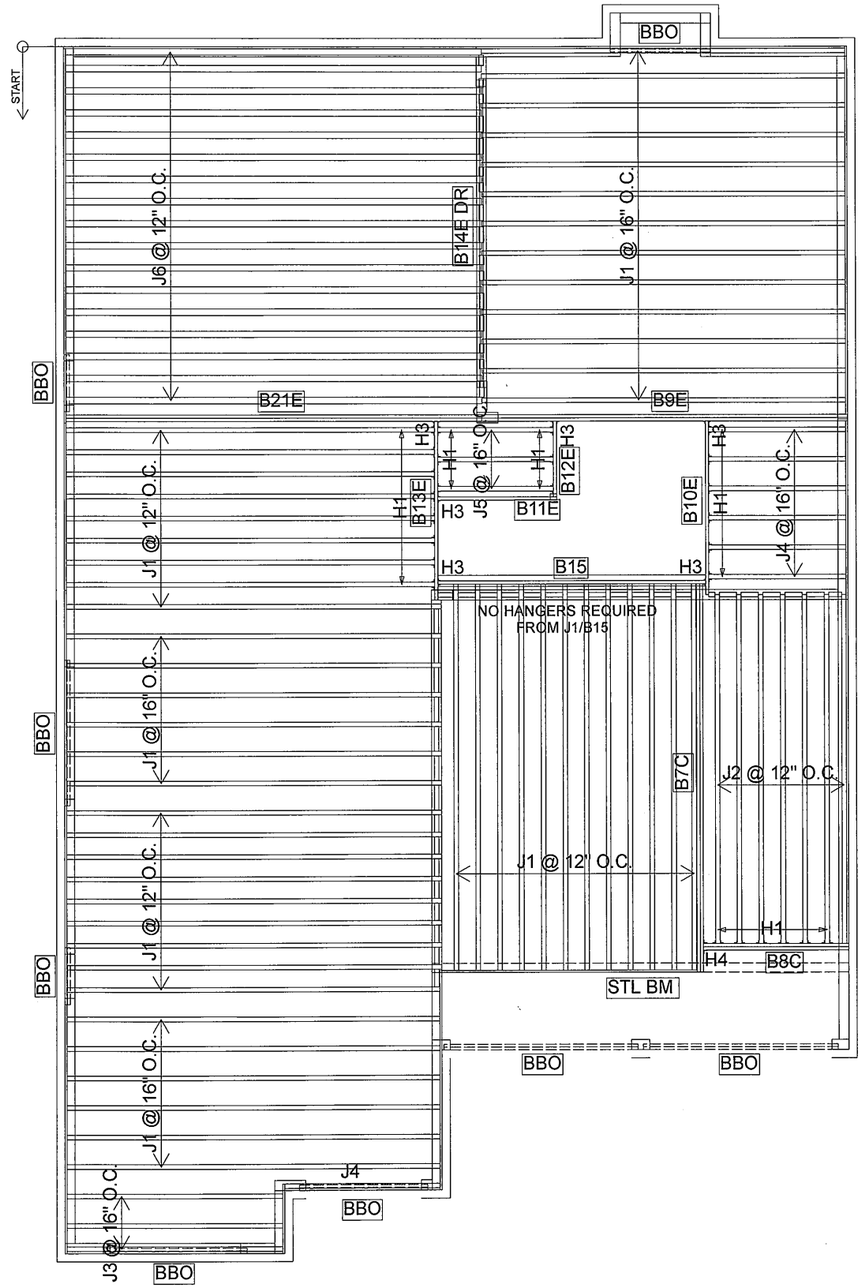
# 2ND FLOOR

STANDARD
4 BEDROOM

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**SUBFLOOR:** 5/8" GLUED AND NAILED

**DATE:** 2021-05-19

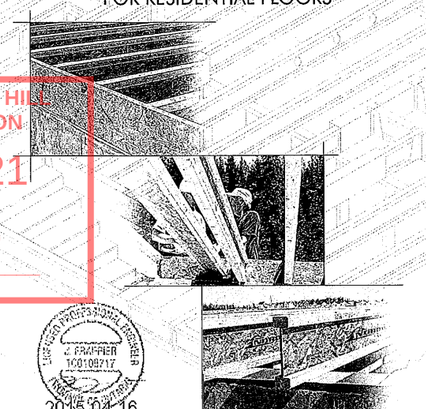
# 2ND FLOOR

OPTION
5 BEDROOM

N-C501 / November 2014

# NORDIC
ENGINEERED WOOD

# INSTALLATION GUIDE
## FOR RESIDENTIAL FLOORS

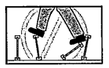




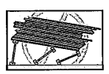


Distributed by:

## SAFETY AND CONSTRUCTION PRECAUTIONS



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



Never stock building materials over unsheathed 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.

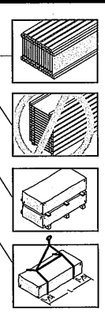
**Avoid Accidents by Following these Important Guidelines:**

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

Improper storage or installation, failure to follow applicable building codes, failure to follow span ratings for Nordic I-joists, failure to follow allowable hole sizes and locations, or failure to use web stiffeners when required can result in serious accidents. Follow these installation guidelines carefully.

## STORAGE AND HANDLING GUIDELINES

1. Bundle wrap can be slippery when wet. Avoid walking on wrapped bundles.
2. Store, stack, and handle I-joists vertically and level only.
3. Always stack and handle I-joists in the upright position only.
4. Do not store I-joists in direct contact with the ground and/or flatwise.
5. Protect I-joists from weather, and use spacers to separate bundles.
6. Bundled units should be kept intact until time of installation.
7. 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.
8. Do not handle I-joists in a horizontal orientation.
9. NEVER USE OR TRY TO REPAIR A DAMAGED I-JOIST.



## MAXIMUM FLOOR SPANS

1. 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.
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, or 3/4 inch for joist spacing of 24 inches. Adhesive shall meet the requirements given in CGSB-71.26 Standard. No concrete topping or bridging element was assumed. Increased spans may be achieved with the used of gypsum and/or a row of blocking at mid-span.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate 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 uniform loads, an engineering analysis may be required based on the use of the design properties.
6. Tables are based on Limit States Design per CAN/CSA O86-09 Standard, and NBC 2010.
7. 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 On centre spacing | | | | Multiple spans On centre spacing | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 12" | 16" | 19.2 | 24" | 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'-5" | 15'-6" | 18'-4" | 17'-3" | 16'-8" | 16'-7" |
| | NI-40x | 18'-1" | 17'-0" | 16'-5" | 16'-6" | 20'-0" | 18'-6" | 17'-9" | 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" |
| | NI-90 | 20'-2" | 18'-7" | 17'-10" | 17'-11" | 22'-3" | 20'-7" | 19'-8" | 19'-9" |
| | NI-90x | 20'-4" | 18'-9" | 17'-11" | 18'-0" | 22'-5" | 20'-9" | 19'-10" | 19'-11" |
| 14" | 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" | 22'-1" | 21'-1" | 21'-2" |
| | NI-80 | 21'-11" | 20'-3" | 19'-4" | 19'-5" | 24'-3" | 22'-5" | 21'-5" | 21'-6" |
| | NI-90 | 22'-5" | 20'-8" | 19'-9" | 19'-10" | 24'-9" | 22'-10" | 21'-10" | 21'-10" |
| | NI-90x | 22'-7" | 20'-11" | 19'-11" | 20'-0" | 25'-0" | 23'-1" | 22'-0" | 22'-2" |
| 16" | NI-60 | 22'-3" | 20'-8" | 19'-9" | 19'-10" | 24'-7" | 22'-9" | 21'-9" | 21'-10" |
| | 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'-5" | 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" |

CCMC EVALUATION REPORT 13032-R

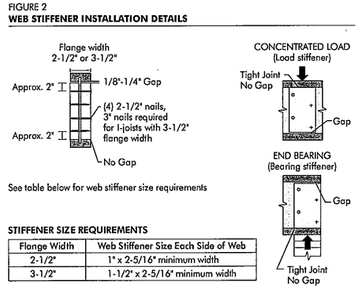
## WEB STIFFENERS

**RECOMMENDATIONS:**

- A ***bearing stiffener*** is required in all engineered applications with factored reactions greater than shown in the I-joist properties table found of 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.

SI units conversion: 1 inch = 25.4 mm

FIGURE 2
**WEB STIFFENER INSTALLATION DETAILS**



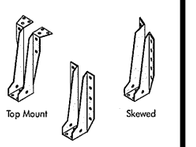

See table below for web stiffener size requirements

**STIFFENER SIZE REQUIREMENTS**

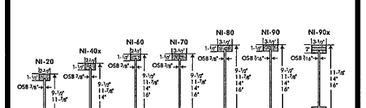
| Flange Width | Web Stiffener Size Each Side of Web |
|---|---|
| 2-1/2" | 1" x 2-5/16" minimum width |
| 3-1/2" | 1-1/2" x 2-5/16" minimum width |

## I-JOIST HANGERS

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




## NORDIC I-JOIST SERIES




| 33 pieces per unit | 33 pieces per unit | 33 pieces per unit | 23 pieces per unit | 23 pieces per unit | 23 pieces per unit | 23 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.

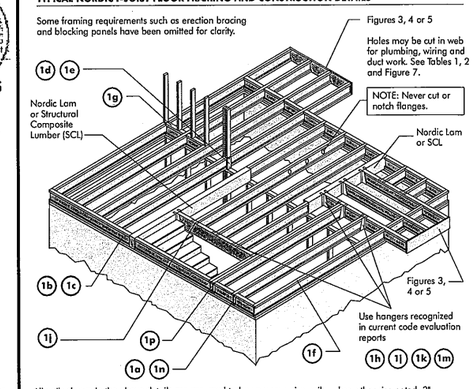
Nordic Engineered Wood I-joists use only finger-jointed black spruce lumber in their flanges, ensuring consistent quality, superior strength and longer span carrying capacity.



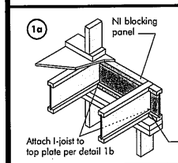
## INSTALLING NORDIC I-JOISTS

1. Before laying out floor system components, verify that I-joist flange widths match hanger widths. If not, contact your supplier.
2. Except for cutting to length, I-joist flanges should **never** be cut, drilled, or notched.
3. Install I-joists so that top and bottom flanges are within 1/2 inch of true vertical alignment.
4. I-joists must be anchored securely to supports before floor sheathing is attached, and supports for multi-span applications must be level.
5. Minimum bearing lengths: 1-3/4 inches for end bearings and 3-1/2 inches for intermediate bearings.
6. When using hangers, seat I-joists firmly in hanger bottoms to minimize settlement.
7. Leave a 1/16-inch gap between the I-joist end and a header.
8. 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.
9. Never install I-joists where they will be permanently exposed to weather, or where they will remain in direct contact with concrete or masonry.
10. Restrain ends of floor joists to prevent rollover. Use rim board, rim joists or I-joist blocking panels.
11. 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 through the floor system to the wall or foundation below.
12. 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.
13. 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 next 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.
14. 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.
15. 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**

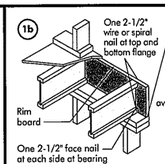



All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for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



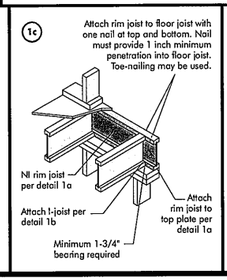

| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load* (plf) |
|---|---|
| NI Joists | 3,300 |

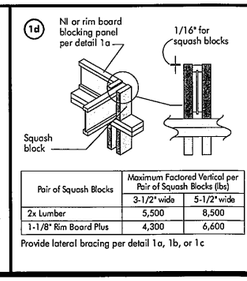
*The uniform vertical load is limited to a joist depth of 16 inches or less and is based on standard term load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer, see detail 1d.




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

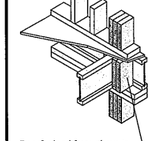
*The uniform vertical load is limited to a rim board depth of 16 inches or less and is based on standard term load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer, see detail 1d.

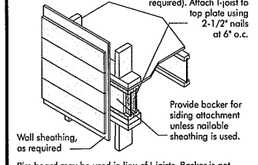


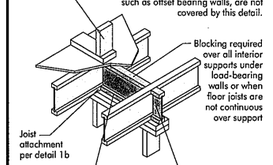

| Pair of Squash Blocks | Maximum Factored Vertical per Pair of Squash Blocks (lbs) | |
|---|---|---|
| | 3-1/2" wide | 5-1/2" wide |
| 2x Lumber | 5,500 | 8,500 |
| 1-1/8" Rim Board Plus | 4,300 | 6,600 |

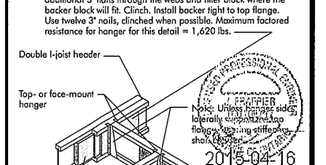
Provide lateral bracing per detail 1a, 1b, or 1c




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.



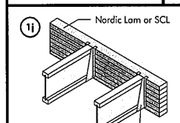

For hanger capacity see hanger manufacturer's recommendations. Verify double I-joist capacity to support concentrated loads.

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" |

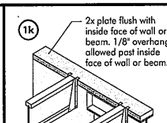
* Minimum grade for backer block material shall be S-P-F No. 2 or better for solid sawn lumber and wood structural panels conforming to CAN/CSA-O325 or CAN/CSA-O437 Standard.

** 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".

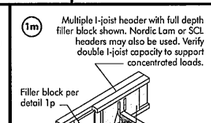



For nailing schedules for multiple beams, see the manufacturer's recommendations.

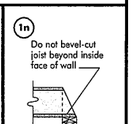
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



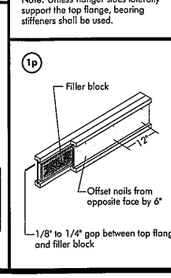

Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.




Maximum support capacity = 1,620 lbs.



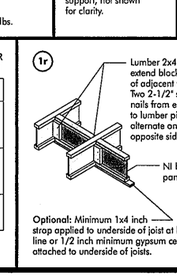

Note: Blocking required at bearing for lateral support, not shown for clarity.

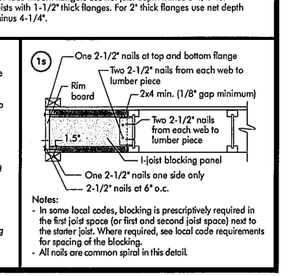



Notes:
1. Support back of I-joist web during nailing to prevent damage to web/flange connection.
2. Leave a 1/8 to 1/4-inch gap between top of filler block and bottom of top I-joist flange.
3. Filler block is required between joists for full length of span.
4. Nail joists together with two rows of 3" 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.
5. The maximum factored load that may be applied to one side of the double joist using this detail is 860 lbf/ft. Verify double I-joist capacity.

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

| Flange Size | Joist Depth | Filler Block Size |
|---|---|---|
| 2-1/2" x 1-1/2" | 9-1/2" | 2-1/8" x 6" |
| | 11-7/8" | 2-1/8" x 8" |
| | 14" | 2-1/8" x 10" |
| | 16" | 2-1/8" x 12" |
| 3-1/2" x 1-1/2" | 9-1/2" | 3" x 6" |
| | 11-7/8" | 3" x 8" |
| | 14" | 3" x 10" |
| | 16" | 3" x 12" |
| 3-1/2" x 2" | 11-7/8" | 3" x 7" |
| | 14" | 3" x 9" |
| | 16" | 3" x 11" |

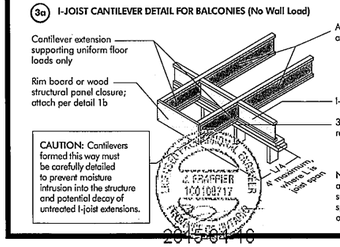


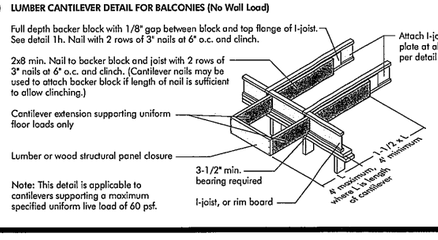

Notes:
- In some local codes, blocking is prescriptively required in the first joist space (or first and second joist space) next to the starter joist. Where required, see local code requirements for spacing of the blocking.
- All nails are common spiral in this detail.

## CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)

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

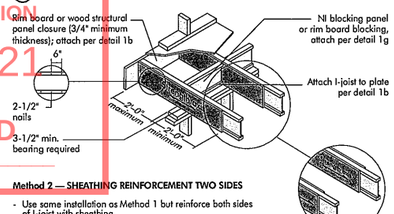



**3b** LUMBER CANTILEVER DETAIL FOR BALCONIES (No Wall Load)




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

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

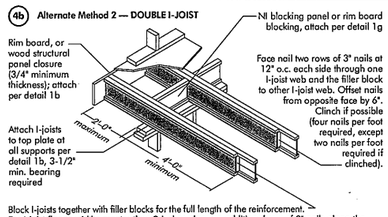



Method 2 — SHEATHING REINFORCEMENT TWO SIDES

- 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".

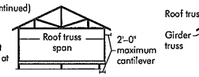
Note: Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4") required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2" nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail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

**4b** Alternate Method 2 — DOUBLE I-JOIST

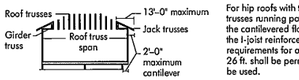



Block I-joists together with filler blocks for the full length of the reinforcement. For I-joist flange widths greater than 3 inches place an additional row of 3" nails along the centreline of the reinforcing panel from each side. Clinch when possible.

FIGURE 4 (continued)




See table below for NI reinforcement requirements at cantilever.




For hip roofs with the jack trusses running parallel to the cantilevered floor joists, the I-joist reinforcement requirements for a span of 26 ft. shall be permitted to be used.

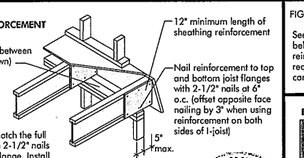
**CANTILEVER REINFORCEMENT METHODS ALLOWED**

| JOIST DEPTH (in.) | ROOF TRUSS SPAN (ft) | ROOF LOADING (UNFACTORED) LL = 30 psf, DL = 15 psf — JOIST SPACING (in.) 12 | 16 | 19.2 | 24 | LL = 40 psf, DL = 15 psf — JOIST SPACING (in.) 12 | 16 | 19.2 | 24 | LL = 50 psf, DL = 15 psf — JOIST SPACING (in.) 12 | 16 | 19.2 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-1/2" | 26 | N | N | 1 | 2 | N | 1 | 2 | X | N | 2 | X | X |
| | 28 | N | 1 | 1 | X | N | 1 | 2 | X | 1 | 2 | X | X |
| | 30 | N | 1 | 1 | X | N | 1 | 2 | X | 1 | 2 | X | X |
| | 32 | N | 1 | 2 | X | N | 2 | X | X | 1 | X | X | X |
| | 34 | N | 1 | 2 | X | N | 2 | X | X | 1 | X | X | X |
| | 36 | N | 1 | 2 | X | 1 | 2 | X | X | 1 | X | X | X |
| 11-7/8" | 26 | N | N | N | 1 | N | N | 1 | 2 | N | N | 1 | 2 |
| | 28 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 1 | 2 |
| | 30 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 2 | X |
| | 32 | N | N | 1 | 1 | N | N | 1 | 2 | N | 1 | 2 | X |
| | 34 | N | N | 1 | 2 | N | 1 | 1 | X | N | 1 | 2 | X |
| | 36 | N | N | 1 | 2 | N | 1 | 2 | X | N | 1 | 2 | X |
| | 38 | N | N | 1 | 2 | N | 1 | 2 | X | N | 2 | X | X |
| 14" | 26 | N | N | N | N | N | N | N | 1 | N | N | N | 1 |
| | 28 | N | N | N | N | N | N | N | 1 | N | N | 1 | 1 |
| | 30 | N | N | N | N | N | N | N | 1 | N | N | 1 | 2 |
| | 32 | N | N | N | 1 | N | N | N | 1 | N | N | 1 | 2 |
| | 34 | N | N | N | 1 | N | N | 1 | 1 | N | N | 1 | 2 |
| | 36 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 1 | 2 |
| | 38 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 1 | X |
| | 40 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 2 | X |
| 16" | 26 | N | N | N | N | N | N | N | N | N | N | N | 1 |
| | 28 | N | N | N | N | N | N | N | 1 | N | N | N | 1 |
| | 30 | N | N | N | N | N | N | N | 1 | N | N | N | 1 |
| | 32 | N | N | N | N | N | N | N | 1 | N | N | 1 | 1 |
| | 34 | N | N | N | N | N | N | N | 1 | N | N | 1 | 2 |
| | 36 | N | N | N | 1 | N | N | N | 1 | N | N | 1 | 2 |
| | 38 | N | N | N | 1 | N | N | N | 1 | N | N | 1 | 2 |
| | 40 | N | N | N | 1 | N | N | 1 | 2 | N | N | 1 | 2 |
| | 42 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 2 | 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 plf wall load. Wall load is based on 3'-0" maximum width window or door openings. For larger openings, or multiple 3'-0" width 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.

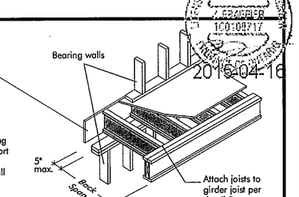


**5a** SHEATHING REINFORCEMENT



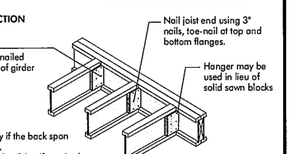

Note: Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4") required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2" nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail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

**5b** SET-BACK DETAIL



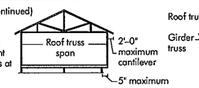

Notes:
- Provide full depth blocking between joists over support (not shown for clarity)
- Attach I-joist to plate at all supports per detail 1b.
- 3-1/2" minimum I-joist bearing required.

**5c** SET-BACK CONNECTION

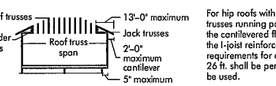



Notes:
- Verify girder joist capacity if the back span exceeds the joist spacing.
- Attach double I-joist per detail 1p, if required.

FIGURE 5 (continued)




See table below for NI reinforcement requirements at cantilever.




For hip roofs with the jack trusses running parallel to the cantilevered floor joists, the I-joist reinforcement requirements for a span of 26 ft. shall be permitted to be used.

**BRICK CANTILEVER REINFORCEMENT METHODS ALLOWED**

| JOIST DEPTH (in.) | ROOF TRUSS SPAN (ft) | ROOF LOADING (UNFACTORED) LL = 30 psf, DL = 15 psf — JOIST SPACING (in.) 12 | 16 | 19.2 | 24 | LL = 40 psf, DL = 15 psf — JOIST SPACING (in.) 12 | 16 | 19.2 | 24 | LL = 50 psf, DL = 15 psf — JOIST SPACING (in.) 12 | 16 | 19.2 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-1/2" | 26 | 2 | X | X | X | 2 | X | X | X | 2 | X | X | X |
| | 28 | 1 | X | X | X | 2 | X | X | X | X | X | X | X |
| | 30 | 1 | X | X | X | 2 | X | X | X | X | X | X | X |
| | 32 | 2 | X | X | X | 2 | X | X | X | X | X | X | X |
| | 34 | 2 | X | X | X | X | X | X | X | X | X | X | X |
| | 36 | 2 | X | X | X | X | X | X | X | X | X | X | X |
| 11-7/8" | 26 | N | 2 | X | X | 1 | X | X | X | 1 | X | X | X |
| | 28 | N | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 30 | 1 | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 32 | 1 | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 34 | 1 | X | X | X | 2 | X | X | X | 2 | X | X | X |
| | 36 | 1 | X | X | X | 2 | X | X | X | X | X | X | X |
| | 38 | 1 | X | X | X | 2 | X | X | X | X | X | X | X |
| 14" | 26 | N | 1 | 2 | X | N | 2 | X | X | 1 | X | X | X |
| | 28 | N | 1 | X | X | 1 | 2 | X | X | 1 | X | X | X |
| | 30 | N | 2 | X | X | 1 | X | X | X | 1 | X | X | X |
| | 32 | N | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 34 | N | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 36 | 1 | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 38 | 1 | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 40 | 1 | X | X | X | 2 | X | X | X | 2 | X | X | X |
| 16" | 26 | N | 1 | 2 | X | N | 1 | X | X | N | 2 | X | X |
| | 28 | N | 1 | 2 | X | N | 2 | X | X | 1 | 2 | X | X |
| | 30 | N | 1 | 2 | X | N | 2 | X | X | 1 | X | X | X |
| | 32 | N | 1 | 2 | X | N | 2 | X | X | 1 | X | X | X |
| | 34 | N | 2 | X | X | 1 | 2 | X | X | 1 | X | X | X |
| | 36 | N | 2 | X | X | 1 | X | X | X | 1 | X | X | X |
| | 38 | N | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 40 | N | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 42 | 1 | 2 | X | X | 1 | X | X | X | 2 | X | 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 plf wall load. Wall load is based on 3'-0" maximum width window or door openings. For larger openings, or multiple 3'-0" width 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 chase 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 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 | 11 | 12 | 12-3/4 | L/Span adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-1/2" | NI-20 | 0'-7" | 1'-5" | 2'-10" | 4'-3" | 5'-8" | 6'-0" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 13-6" |
| | NI-40x | 0'-7" | 1'-6" | 3'-0" | 4'-4" | 6'-0" | 6'-4" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 14-9" |
| | NI-60 | 1'-3" | 2'-6" | 4'-0" | 5'-4" | 7'-0" | 7'-5" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 14-11" |
| | NI-70 | 2'-0" | 3'-4" | 4'-9" | 6'-3" | 8'-0" | 8'-4" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 15-7" |
| | NI-80 | 2'-3" | 3'-6" | 5'-0" | 6'-6" | 8'-2" | 8'-8" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 15-9" |
| 11-7/8" | NI-20 | 0'-7" | 0'-8" | 1'-0" | 2'-4" | 3'-8" | 4'-0" | 5'-0" | 6'-6" | 7'-9" | --- | --- | --- | --- | --- | --- | 13-6" |
| | NI-40x | 0'-7" | 0'-8" | 1'-3" | 2'-8" | 4'-0" | 4'-4" | 5'-5" | 7'-0" | 8'-4" | --- | --- | --- | --- | --- | --- | 16-5" |
| | NI-60 | 0'-7" | 1'-8" | 3'-0" | 4'-3" | 5'-9" | 6'-0" | 7'-3" | 9'-1-0" | 10'-0" | --- | --- | --- | --- | --- | --- | 16-9" |
| | NI-70 | 1'-3" | 2'-6" | 4'-0" | 5'-4" | 6'-9" | 7'-2" | 8'-4" | 10'-0" | 11'-0" | --- | --- | --- | --- | --- | --- | 17-5" |
| | NI-80 | 1'-6" | 2'-10" | 4'-2" | 5'-6" | 7'-0" | 7'-5" | 8'-6" | 10'-3" | 11'-4" | --- | --- | --- | --- | --- | --- | 17-7" |
| | NI-90 | 0'-7" | 0'-8" | 1'-5" | 3'-2" | 4'-10" | 5'-4" | 6'-9" | 8'-9" | 10'-2" | --- | --- | --- | --- | --- | --- | 17-11" |
| | NI-90x | 0'-7" | 0'-8" | 0'-8" | 2'-5" | 4'-4" | 4'-9" | 6'-3" | --- | --- | --- | --- | --- | --- | --- | --- | 18-0" |
| 14" | NI-40x | 0'-7" | 0'-8" | 0'-8" | 1'-0" | 2'-4" | 2'-9" | 3'-9" | 5'-2" | 6'-0" | 6'-6" | 8'-3" | 10'-2" | --- | --- | --- | 17-11" |
| | 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" | --- | --- | --- | 18-2" |
| | 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" | --- | --- | --- | 19-2" |
| | NI-80 | 0'-10" | 2'-0" | 3'-4" | 4'-9" | 6'-2" | 6'-5" | 7'-7" | 9'-2" | 10'-0" | 10'-8" | 12'-4" | 13'-9" | --- | --- | --- | 19-5" |
| | NI-90 | 0'-7" | 0'-8" | 0'-10" | 2'-5" | 4'-0" | 4'-5" | 5'-9" | 7'-5" | 8'-8" | 9'-4" | 11'-4" | 12'-11" | --- | --- | --- | 19-9" |
| | NI-90x | 0'-7" | 0'-8" | 0'-8" | 2'-0" | 3'-9" | 4'-2" | 5'-5" | 7'-3" | 8'-5" | 9'-0" | --- | --- | --- | --- | --- | 20-0" |
| 16" | NI-60 | 0'-7" | 0'-8" | 0'-8" | 1'-0" | 2'-10" | 3'-2" | 4'-2" | 5'-8" | 6'-7" | 7'-0" | 8'-5" | 9'-8" | 10'-2" | 12'-2" | 13'-9" | 19'-10" |
| | NI-70 | 0'-7" | 1'-0" | 2'-3" | 3'-6" | 4'-10" | 5'-3" | 6'-3" | 7'-8" | 8'-6" | 9'-2" | 10'-8" | 12'-0" | 12'-4" | 14'-0" | 15'-6" | 20'-10" |
| | NI-80 | 0'-7" | 1'-3" | 2'-6" | 3'-10" | 5'-3" | 5'-6" | 6'-7" | 8'-0" | 8'-11" | 9'-5" | 11'-0" | 12'-3" | 12'-9" | 14'-5" | 16'-0" | 21'-2" |
| | NI-90 | 0'-7" | 0'-8" | 0'-8" | 1'-9" | 3'-3" | 3'-8" | 4'-9" | 6'-5" | 7'-5" | 8'-0" | 9'-10" | 11'-3" | 11'-9" | 13'-9" | 15'-4" | 21'-6" |
| | NI-90x | 0'-7" | 0'-8" | 0'-8" | 1'-6" | 3'-0" | 3'-6" | 4'-6" | 6'-3" | 7'-3" | 8'-4" | 10'-2" | 11'-6" | 12'-0" | --- | --- | 21'-10" |

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 Spans Tables), the minimum distance from the centreline of the hole to the face of any support (D) as given above may be reduced as follows:

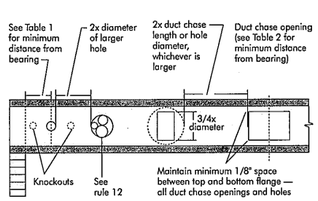
$$D_{reduced} = \frac{l_{actual}}{SAF} \times D$$

Where: $D_{reduced}$ = Distance from the inside face of any support to centre of hole, reduced for less-than-maximum span applications (ft-in.). This distance shall not be less than 6 inches from the face of the support to edge of the hole.
$l_{actual}$ = The actual measured span distance between the inside faces of supports (ft).
SAF = 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 $\frac{l_{actual}}{SAF}$ is greater than 1, use 1 in the above calculation for $\frac{l_{actual}}{SAF}$.

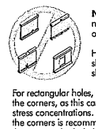


FIGURE 7
**FIELD-CUT HOLE LOCATOR**




A knockout is NOT considered a hole, may be utilized wherever it occurs and may be ignored for purposes of calculating minimum distances between holes.

Knockouts are prescored 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.

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" | NI-20 | 4'-1" | 4'-5" | 5'-4" | 5'-8" | 6'-1" | 6'-6" | 7'-1" | 7'-5" | |
| | NI-40x | 5'-3" | 5'-8" | 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'-11" | 5'-5" | 5'-10" | 6'-3" | 6'-7" | 7'-1" | 7'-6" | 8'-1" | 8'-4" |
| | NI-80 | 5'-2" | 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'-2" | 7'-8" | 8'-0" | 8'-6" | 9'-0" | 9'-6" | 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'-9" | 9'-3" | 9'-8" | 10'-2" | 10'-8" |
| | NI-90 | 7'-6" | 7'-11" | 8'-4" | 8'-9" | 9'-2" | 9'-7" | 10'-1" | 10'-7" | 10'-11" |
| | NI-90x | 6'-7" | 6'-8" | 8'-10" | 8'-6" | 8'-10" | 9'-3" | 9'-8" | 10'-2" | 11'-2" |
| 14" | NI-40x | 8'-1" | 8'-7" | 9'-0" | 9'-6" | 10'-1" | 10'-7" | 11'-2" | 12'-0" | 12'-8" |
| | NI-60 | 8'-9" | 9'-3" | 9'-8" | 10'-1" | 10'-6" | 11'-1" | 11'-8" | 12'-3" | 13'-0" |
| | NI-70 | 8'-7" | 9'-1" | 9'-5" | 9'-10" | 10'-4" | 10'-8" | 11'-2" | 11'-7" | 12'-3" |
| | NI-80 | 9'-0" | 9'-3" | 9'-9" | 10'-1" | 10'-7" | 11'-1" | 11'-5" | 12'-1" | 12'-6" |
| | NI-90 | 9'-2" | 9'-8" | 10'-0" | 10'-6" | 10'-11" | 11'-5" | 11'-9" | 12'-4" | 12'-11" |
| | NI-90x | 9'-6" | 9'-9" | 10'-3" | 10'-7" | 11'-1" | 11'-7" | 12'-1" | 12'-7" | 13'-0" |
| 16" | NI-60 | 10'-5" | 10'-8" | 11'-2" | 11'-6" | 12'-1" | 12'-6" | 13'-2" | 14'-1" | 14'-10" |
| | 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'-9" | 12'-1" | 12'-7" | 13'-1" | 13'-8" | 14'-4" |
| | NI-90 | 10'-9" | 11'-2" | 11'-8" | 12'-0" | 12'-6" | 13'-0" | 13'-6" | 14'-2" | 14'-10" |
| | NI-90x | 11'-1" | 11'-5" | 11'-10" | 12'-4" | 12'-10" | 13'-2" | 13'-9" | 14'-4" | 15'-2" |

1. Above table may be used for I-joist spacing of 24 inches on centre or less.
2. Duct chase opening location distance is measured from inside face of supports to centre of opening.
3. The above table is based on simple-span joists only. For other applications, contact your local distributor.
4. 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. For other applications, contact your local distributor.

## 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 assure 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 end 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 2-1/2" 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(1)**

| Maximum Joist Spacing (in.) | Minimum Panel Thickness (in.) | Nail Size and Type — Common Wire or Spiral Nails | Ring Thread Nails or Screws | Staples | Maximum Spacing of Fasteners — 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" |

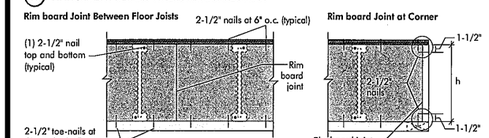
1. Fasteners of sheathing and subflooring shall conform to the above table.
2. Staples shall not be less than 1/16-inch in diameter or thickness, with not less than a 3/8-inch crown driven with the crown parallel to framing.
3. Flooring screws shall not be less than 1/8-inch in diameter.
4. Special conditions 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 System, 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.*

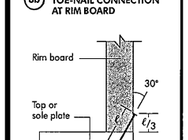
**IMPORTANT NOTE:**
**Floor sheathing must be field glued to the I-joist flanges in order to achieve the maximum spans shown in this document. If sheathing is nailed only, I-joist spans must be verified with your local distributor.**

## RIM BOARD INSTALLATION DETAILS

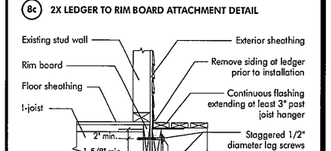
**8a** ATTACHMENT DETAILS WHERE RIM BOARDS ABUT




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




**8c** 2X LEDGER TO RIM BOARD ATTACHMENT DETAIL

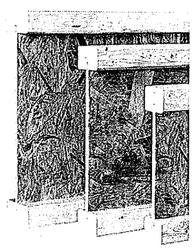





**PRODUCT WARRANTY**

*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 specification for the lifetime of the structure.*



# CONSTRUCTION DETAILS FOR RESIDENTIAL FLOORS

N-C303 / April 2014

NORDIC ENGINEERED WOOD

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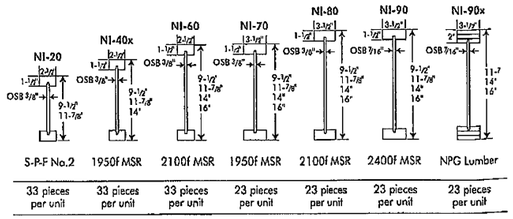
The mark of responsible forestry

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:

1. 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.
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 are 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 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 | 11 | 12 | 12-3/4 |
| 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'-4" | 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" | --- | --- | --- | --- | --- | --- |
| | NI-90 | 0'-7" | 0'-8" | 1'-5" | 3'-2" | 4'-10" | 5'-4" | 6'-9" | 8'-9" | 10'-2" | --- | --- | --- | --- | --- | --- |
| | NI-90x | 0'-7" | 0'-8" | 0'-9" | 2'-5" | 4'-4" | 4'-9" | 6'-3" | --- | --- | --- | --- | --- | --- | --- | --- |
| 14" | NI-40x | 0'-7" | 0'-8" | 0'-8" | 1'-0" | 2'-4" | 2'-9" | 3'-9" | 5'-2" | 6'-0" | 6'-6" | 8'-3" | 10'-2" | --- | --- | --- |
| | 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" | --- | --- | --- |
| | NI-90 | 0'-7" | 0'-8" | 0'-10" | 2'-5" | 4'-0" | 4'-5" | 5'-9" | 7'-5" | 8'-8" | 9'-4" | 11'-4" | 12'-11" | --- | --- | --- |
| | NI-90x | 0'-7" | 0'-8" | 0'-8" | 2'-0" | 3'-9" | 4'-2" | 5'-5" | 7'-3" | 8'-5" | 9'-2" | --- | --- | --- | --- | --- |
| 16" | NI-60 | 0'-7" | 0'-8" | 0'-8" | 1'-6" | 2'-10" | 3'-2" | 4'-2" | 5'-6" | 6'-4" | 7'-0" | 8'-5" | 9'-8" | 10'-2" | 12'-2" | 13'-9" |
| | NI-70 | 0'-7" | 1'-0" | 2'-3" | 3'-6" | 4'-10" | 5'-3" | 6'-3" | 7'-8" | 8'-6" | 9'-2" | 10'-8" | 12'-0" | 12'-4" | 14'-0" | 15'-6" |
| | NI-80 | 0'-7" | 1'-3" | 2'-6" | 3'-10" | 5'-3" | 5'-6" | 6'-6" | 8'-0" | 9'-0" | 9'-8" | 11'-0" | 12'-3" | 12'-9" | 14'-5" | 16'-0" |
| | NI-90 | 0'-7" | 0'-8" | 0'-8" | 1'-9" | 3'-3" | 3'-8" | 4'-9" | 6'-5" | 7'-5" | 8'-0" | 9'-10" | 11'-3" | 11'-9" | 13'-9" | 15'-4" |
| | NI-90x | 0'-7" | 0'-8" | 0'-9" | 2'-0" | 3'-6" | 4'-0" | 5'-0" | 6'-9" | 7'-9" | 8'-4" | 10'-2" | 11'-6" | 12'-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.
4. 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

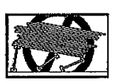
Simple Span Only

| 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'-8" | 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'-6" | 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'-5" |
| | NI-60 | 7'-3" | 7'-8" | 8'-0" | 8'-6" | 9'-0" | 9'-3" | 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" |
| | NI-90 | 7'-6" | 7'-11" | 8'-4" | 8'-9" | 9'-2" | 9'-7" | 10'-1" | 10'-7" | 10'-11" |
| | NI-90x | 7'-7" | 8'-1" | 8'-5" | 8'-10" | 9'-4" | 9'-8" | 10'-2" | 10'-8" | 11'-2" |
| 14" | NI-40x | 8'-1" | 8'-7" | 9'-0" | 9'-6" | 10'-1" | 10'-7" | 11'-2" | 12'-0" | 12'-8" |
| | NI-60 | 8'-9" | 9'-3" | 9'-8" | 10'-1" | 10'-6" | 11'-1" | 11'-6" | 13'-3" | 13'-0" |
| | NI-70 | 8'-7" | 9'-1" | 9'-5" | 9'-10" | 10'-4" | 10'-8" | 11'-2" | 11'-7" | 12'-3" |
| | NI-80 | 9'-0" | 9'-3" | 9'-9" | 10'-1" | 10'-7" | 11'-1" | 11'-6" | 12'-1" | 12'-6" |
| | NI-90 | 9'-2" | 9'-8" | 10'-0" | 10'-6" | 10'-11" | 11'-5" | 11'-9" | 12'-4" | 12'-11" |
| | NI-90x | 9'-4" | 9'-9" | 10'-3" | 10'-7" | 11'-1" | 11'-7" | 12'-1" | 12'-7" | 13'-2" |
| 16" | NI-60 | 10'-3" | 10'-8" | 11'-2" | 11'-6" | 12'-1" | 12'-6" | 13'-2" | 14'-1" | 14'-10" |
| | 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'-9" | 12'-1" | 12'-7" | 13'-1" | 13'-8" | 14'-4" |
| | NI-90 | 10'-9" | 11'-2" | 11'-8" | 12'-0" | 12'-6" | 13'-0" | 13'-6" | 14'-2" | 14'-10" |
| | NI-90x | 11'-1" | 11'-5" | 11'-10" | 12'-4" | 12'-10" | 13'-2" | 13'-9" | 14'-4" | 15'-2" |

1. Above table may be used for I-joist spacing of 24 inches on centre or less.
2. Duct chase opening location distance is measured from inside face of supports to centre of opening.
3. The above table is based on simple-span joists only. For other applications, contact your local distributor.
4. 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.
5. 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.

## 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 unsheathed 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:

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

Improper storage or installation, failure to follow applicable building codes, failure to follow span ratings for Nordic I-joists, failure to follow allowable hole sizes and locations, or failure to use web stiffeners when required can result in serious accidents. Follow these installation guidelines carefully.

CHANTIERS CHIBOUGAMAU

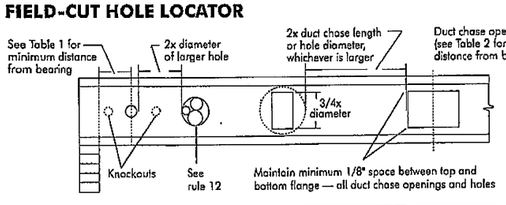
## PRODUCT WARRANTY

*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.*

FIGURE 7

### FIELD-CUT HOLE LOCATOR



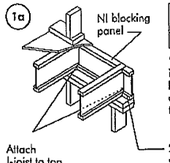

Knockouts are prescored holes provided for the contractor's convenience to install electrical or small plumbing lines. They are 1-1/2 inches in diameter, and are spaced 15 inches on centre along the length of the I-joist. Where possible, it is preferable to use knockouts instead of field-cut holes.

**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.

1a

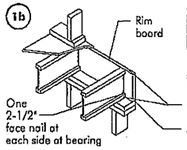



| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load* (plf) |
|---|---|
| NI Joists | 3,300 |

*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.

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)

1b




| 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.

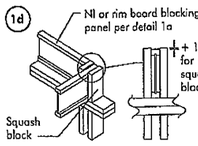
One 2-1/2" wire or spiral nail at top and bottom flange

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.

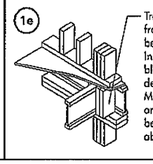
1d



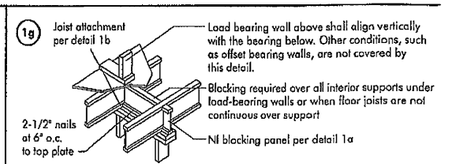

| Pair of Squash Blocks | Maximum Factored Vertical Load per Pair of Squash Blocks (lbs) | |
|---|---|---|
| | 3-1/2" wide | 5-1/2" wide |
| 2x Lumber | 5,500 | 8,500 |
| 1-1/8" Rim Board Plus | 4,300 | 6,600 |

Provide lateral bracing per detail 1a or 1b

1e




1g



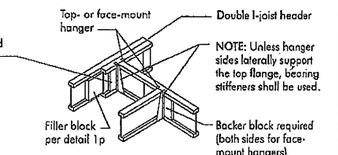

1h

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)

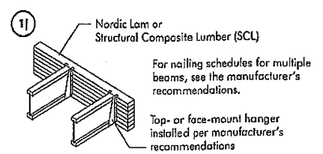
| Flange Width | Material Thickness Required* | Minimum Depth** |
|---|---|---|
| 2-1/2" | 1" | 5-1/2" |
| 3-1/2" | 1-1/2" | 7-1/4" |

* 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-O325 or CAN/CSA-O437 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".



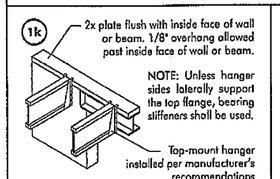

For hanger capacity see hanger manufacturer's recommendations. Verify double I-joist capacity to support concentrated loads.

1j

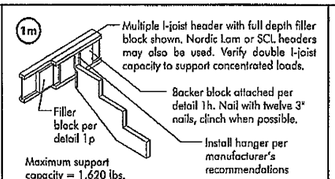



NOTE: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

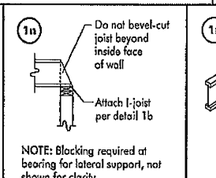
1k




1m

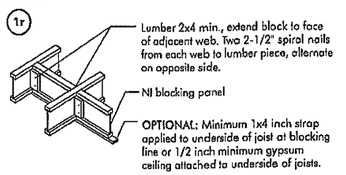



1n



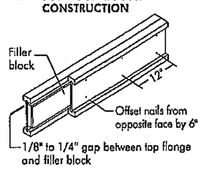

NOTE: Blocking required at bearing for lateral support, not shown for clarity.

1r




1p

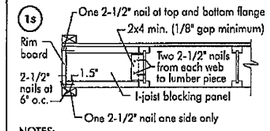
**FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION**




NOTES:
1. Support back of I-joist web during nailing to prevent damage to web/flange connection.
2. Leave a 1/8 to 1/4-inch gap between top of filler block and bottom of top I-joist flange.
3. Filler block is required between joists for full length of span.
4. 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.
5. The maximum factored load that may be applied to one side of the double joist using this detail is 860 lbf/ft. Verify double I-joist capacity.

| Flange Size | Net Depth | Filler Block Size |
|---|---|---|
| 2-1/2" x 1-1/2" | 9-1/2" | 2-1/8" x 6" |
| | 11-7/8" | 2-1/8" x 8" |
| | 14" | 2-1/8" x 10" |
| | 16" | 2-1/8" x 12" |
| 3-1/2" x 1-1/2" | 9-1/2" | 3" x 6" |
| | 11-7/8" | 3" x 8" |
| | 14" | 3" x 10" |
| | 16" | 3" x 12" |
| 3-1/2" x 2" | 11-7/8" | 3" x 7" |
| | 14" | 3" x 9" |
| | 16" | 3" x 11" |

1s




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.**

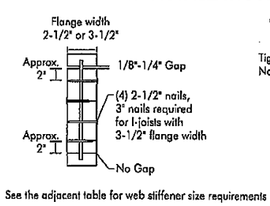
### WEB STIFFENERS

RECOMMENDATIONS:

- A *bearing stiffener* is required in all engineered applications with factored reactions greater than shown in the I-joist properties table found of 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



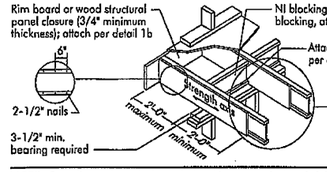

See the adjacent table for web stiffener size requirements

**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




Method 2 — SHEATHING REINFORCEMENT TWO SIDES

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

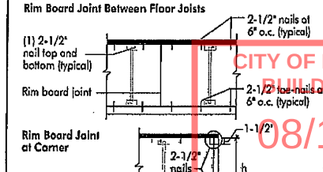

Use nailing pattern shown for Method 1 with opposite face nailing offset by 3".

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




8b TOE-NAIL CONNECTION AT RIM BOARD

NORDIC STRUCTURES

**COMPANY**
Aug. 26, 2020 09:23

**PROJECT**
J7 - 1ST FLOOR

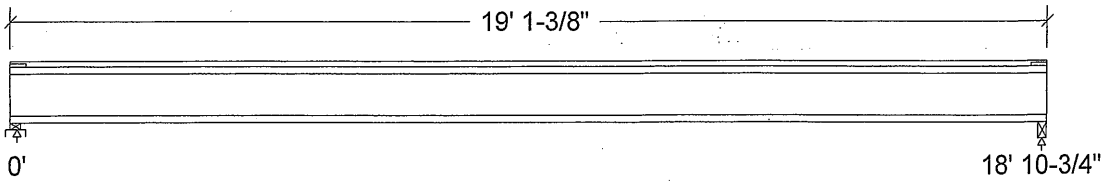
# Design Check Calculation Sheet

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 | 189 | | 189 |
| Live | 378 | | 378 |
| Factored: | | | |
| Total | 803 | | 803 |
| Bearing: | | | |
| Capacity | | | |
| Joist | 2188 | | 2154 |
| Support | 5573 | | - |
| Des ratio | | | |
| Joist | 0.37 | | 0.37 |
| Support | 0.14 | | - |
| Load case | #2 | | #2 |
| Length | 2-3/8 | | 2 |
| Min req'd | 1-3/4 | | 1-3/4 |
| Stiffener | No | | No |
| KD | 1.00 | | 1.00 |
| KB support | 1.00 | | - |
| fcp sup | 769 | | - |
| Kzcp sup | 1.09 | | - |



**Nordic Joist 11-7/8" NI-80 Floor joist @ 12" o.c.**

Supports: 1 - Lumber Sill plate, No.1/No.2; 2 - Steel Beam, W;
Total length: 19' 1-3/8"; Clear span: 18' 9"; 3/4" 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 = 803 | Vr = 2336 | lbs | Vf/Vr = 0.34 |
| Moment(+) | Mf = 3794 | Mr = 11609 | lbs-ft | Mf/Mr = 0.33 |
| Perm. Defl'n | 0.11 = < L/999 | 0.63 = L/360 | in | 0.17 |
| Live Defl'n | 0.21 = < L/999 | 0.47 = L/480 | in | 0.45 |
| Total Defl'n | 0.32 = L/715 | 0.94 = L/240 | in | 0.34 |
| Bare Defl'n | 0.24 = L/954 | 0.63 = L/360 | in | 0.38 |
| Vibration | Lmax = 18'-10.8 | Lv = 21'-2.7 | ft | 0.89 |
| Defl'n | = 0.025 | = 0.033 | in | 0.75 |

## Additional Data:

| FACTORS: | f/E | KD | KH | KZ | KL | KT | KS | KN | LC# |
|---|---|---|---|---|---|---|---|---|---|
| Vr | 2336 | 1.00 | 1.00 | - | - | - | - | - | #2 |
| Mr+ | 11609 | 1.00 | 1.00 | - | 1.000 | - | - | - | #2 |
| EI | 547.1 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:

EIeff = 625.37 lb-in^2 K= 6.18e06 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.

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NORDIC STRUCTURES

**COMPANY**
Aug. 25, 2020 17:31

**PROJECT**
J6 - 2ND FLOOR

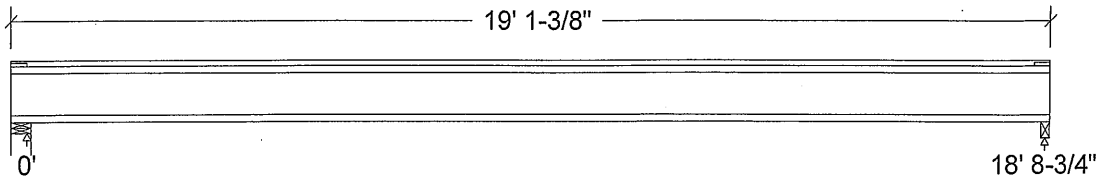
## Design Check Calculation Sheet

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 | 187 | | 187 |
| Live | 375 | | 375 |
| Factored: | | | |
| Total | 796 | | 796 |
| Bearing: | | | |
| Capacity | | | |
| Joist | 2336 | | 2154 |
| Support | 10841 | | 4305 |
| Des ratio | | | |
| Joist | 0.34 | | 0.37 |
| Support | 0.07 | | 0.18 |
| Load case | #2 | | #2 |
| Length | 4-3/8 | | 2 |
| Min req'd | 1-3/4 | | 1-3/4 |
| Stiffener | No | | No |
| KD | 1.00 | | 1.00 |
| KB support | - | | 1.00 |
| fcp sup | 769 | | 769 |
| Kzcp sup | - | | 1.00 |

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

**Nordic Joist 11-7/8" NI-80 Floor joist @ 12" o.c.**

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

Total length: 19' 1-3/8"; Clear span: 18' 7"; 5/8" nailed and glued OSB sheathing with 1/2" gypsum ceiling

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

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PROVINCE OF ONTARIO

P6 of 6

DWG NO. TAM B758-21
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## Limit States Design using CSA O86-14 and Vibration Criterion:

| Criterion | Analysis Value | Design Value | Unit | Analysis/Design |
|---|---|---|---|---|
| Shear | Vf = 796 | Vr = 2336 | lbs | Vf/Vr = 0.34 |
| Moment(+) | Mf = 3727 | Mr = 11609 | lbs-ft | Mf/Mr = 0.32 |
| Perm. Defl'n | 0.10 = < L/999 | 0.62 = L/360 | in | 0.17 |
| Live Defl'n | 0.21 = < L/999 | 0.47 = L/480 | in | 0.44 |
| Total Defl'n | 0.31 = L/720 | 0.94 = L/240 | in | 0.33 |
| Bare Defl'n | 0.23 = L/978 | 0.62 = L/360 | in | 0.37 |
| Vibration | Lmax = 18'-8.8 | Lv = 20'-5.8 | ft | 0.91 |
| Defl'n | = 0.027 | = 0.034 | in | 0.81 |

## Additional Data:

| FACTORS: | f/E | KD | KH | KZ | KL | KT | KS | KN | LC# |
|---|---|---|---|---|---|---|---|---|---|
| Vr | 2336 | 1.00 | 1.00 | - | - | - | - | - | #2 |
| Mr+ | 11609 | 1.00 | 1.00 | - | 1.000 | - | - | - | #2 |
| EI | 547.1 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:

EIeff = 613.27 lb-in^2 K= 6.18e06 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.

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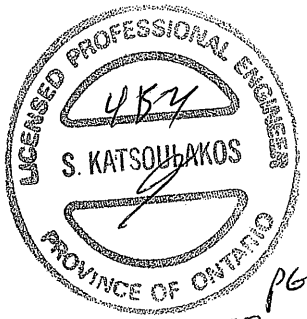


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NORDIC STRUCTURES

**COMPANY**
Aug. 26, 2020 09:18

**PROJECT**
J1 - 2ND FLOOR CANT

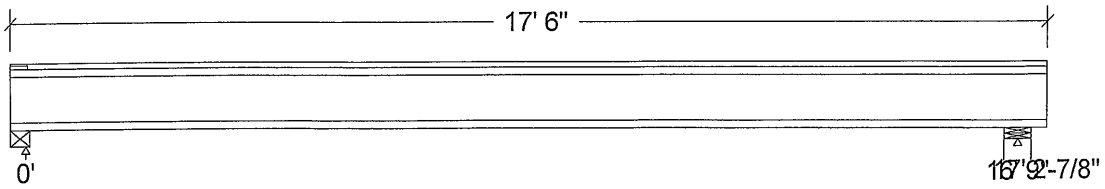
## Design Check Calculation Sheet

Nordic Sizer – Canada 7.2

### Loads:

| Load | Type | Distribution | Pat-tern | Location [ft] Start | End | Magnitude Start | End | Unit |
|---|---|---|---|---|---|---|---|---|
| Load1 | Dead | Full Area | No | | | 20.00 | | psf |
| Load2 | Live | Full Area | Yes | | | 40.00 | | psf |

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




| | | | | |
|---|---|---|---|---|
| Unfactored: | | | | |
| Dead | 167 | | 177 | |
| Live | 335 | | 355 | |
| Factored: | | | | |
| Total | 712 | | 754 | |
| Bearing: | | | | |
| Capacity | | | | |
| Joist | 2334 | | 2336 | |
| Support | - | | 9724 | |
| Des ratio | | | | |
| Joist | 0.30 | | 0.32 | |
| Support | - | | 0.08 | |
| Load case | #4 | | #2 | |
| Length | 4 | | 5-1/2 | |
| Min req'd | 1-3/4 | | 1-3/4 | |
| Stiffener | No | | No | |
| KD | 1.00 | | 1.00 | |
| KB support | - | | - | |
| fcp sup | - | | 769 | |
| Kzcp sup | - | | - | |

*Minimum bearing length for joists is 3" for intermediate supports
Bearing for wall supports is perpendicular-to-grain bearing on top plate. No stud design included.

**Nordic Joist 11-7/8" NI-40x Floor joist @ 12" o.c.**
Supports: 1 - Steel Beam, W; 2 - Lumber Wall, No.1/No.2;
Total length: 17' 6"; Clear span: 16' 5-3/8", 0' 3-1/8"; 5/8" nailed and glued OSB sheathing
**This section PASSES the design code check.**

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P6 4/2

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

| Criterion | Analysis Value | Design Value | Unit | Analysis/Design |
|---|---|---|---|---|
| Shear | Vf = 712 | Vr = 2336 | lbs | Vf/Vr = 0.31 |
| Moment(+) | Mf = 2980 | Mr = 6255 | lbs-ft | Mf/Mr = 0.48 |
| Moment(-) | Mf = 10 | Mr = 4065 | lbs-ft | Mf/Mr = 0.00 |
| Deflection: | | | | |
| Interior Perm | 0.09 = < L/999 | 0.56 = L/360 | in | 0.17 |
| Live | 0.19 = < L/999 | 0.42 = L/480 | in | 0.44 |
| Total | 0.28 = L/723 | 0.84 = L/240 | in | 0.33 |
| Cantil. Perm | -0.01 = L/770 | 0.03 = L/180 | in | 0.23 |
| Live | -0.02 = L/383 | 0.02 = L/240 | in | 0.63 |
| Total | -0.02 = L/256 | 0.05 = L/120 | in | 0.47 |
| Bare Defl'n | -0.02 = L/329 | 0.03 = L/180 | in | 0.55 |
| Vibration | Lmax = 16'-9 | Lv = 18'-3.6 | ft | 0.92 |
| Defl'n | = 0.029 | = 0.038 | in | 0.76 |

## Additional Data:

| FACTORS: | f/E | KD | KH | KZ | KL | KT | KS | KN | LC# |
|---|---|---|---|---|---|---|---|---|---|
| Vr | 2336 | 1.00 | 1.00 | - | - | - | - | - | #2 |
| Mr+ | 6255 | 1.00 | 1.00 | - | 1.000 | - | - | - | #4 |
| Mr- | 6255 | 0.65 | 1.00 | - | 1.000 | - | - | - | #5 |
| EI | 371.1 million | | - | - | - | - | - | - | #4 |

CRITICAL LOAD COMBINATIONS:

Shear : LC #2 = 1.25D + 1.5L
Moment(+) : LC #4 = 1.25D + 1.5L (pattern: L_)
Moment(-) : LC #5 = 1.25D + 1.5L (pattern: _L)
Deflection: LC #1 = 1.0D (permanent)
LC #4 = 1.0D + 1.0L (pattern: L_) (live)
LC #4 = 1.0D + 1.0L (pattern: L_) (total)
LC #4 = 1.0D + 1.0L (pattern: L_) (bare joist)
Bearing : Support 1 - LC #4 = 1.25D + 1.5L (pattern: L_)
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:

EIeff = 432.91 lb-in^2 K= 6.18e06 lbs
"Live" deflection is due to all non-dead loads (live, wind, snow…)

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## 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.

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P6/2
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STRUCTURAL COMPONENT ONLY

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

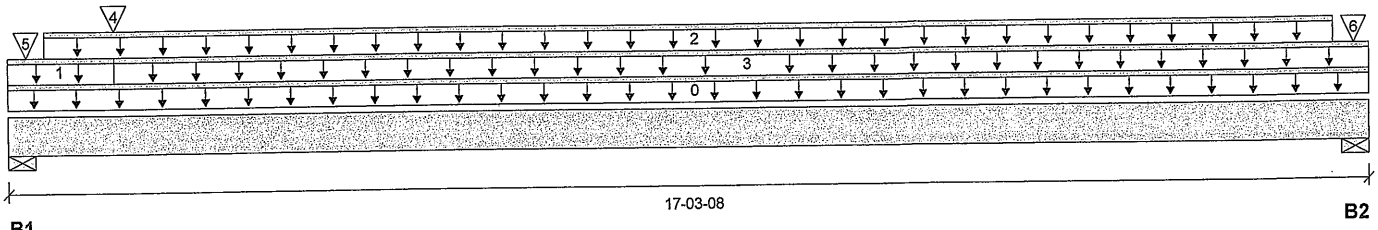
## 1ST FLOOR \Flush Beams\B51(i20612) (Flush Beam)

Dry | 1 span | No cant.

May 19, 2021 17:02:13

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - EL A,B,C STAND...RM SUNKEN FOYER.mmdl
Description: 1ST FLOOR \Flush Beams\B51(i20612)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 17-03-08**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 571 / 0 | 963 / 0 | 75 / 0 | |
| B2, 5-1/2" | 176 / 0 | 768 / 0 | 75 / 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 | 17-03-08 | Top | | 12 | | | 00-00-00 |
| 1 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-04-00 | Top | 20 | | | | n\a |
| 2 | WALL | Unf. Lin. (lb/ft) | L | 00-05-08 | 16-10-00 | Top | | 60 | | | n\a |
| 3 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 01-04-00 | 17-03-08 | Top | 18 | 9 | | | n\a |
| 4 | J7(i20156) | Conc. Pt. (lbs) | L | 01-04-00 | 01-04-00 | Top | 441 | 220 | | | n\a |
| 5 | E80(i20610) | Conc. Pt. (lbs) | L | 00-02-12 | 00-02-12 | Top | | 83 | 75 | | n\a |
| 6 | 6(i699) | Conc. Pt. (lbs) | L | 17-01-04 | 17-01-04 | Top | | 84 | 75 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 3996 ft-lbs | 23005 ft-lbs | 17.4% | 0 | 08-06-07 |
| End Shear | 1732 lbs | 14464 lbs | 12.0% | 1 | 01-05-06 |
| Total Load Deflection | L/1061 (0.187") | n\a | 22.6% | 35 | 08-06-07 |
| Live Load Deflection | L/999 (0.042") | n\a | n\a | 51 | 08-02-06 |
| Max Defl. | 0.187" | n\a | n\a | 35 | 08-06-07 |
| Span / Depth | 16.7 | | | | |

## Bearing Supports

| | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 3-1/2" | 2135 lbs | 18.0% | 9.1% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 1075 lbs | 14.0% | 7.0% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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
Calculations assume unbraced length of Top: 00-00-00, Bottom: 15-04-12.

CONFORMS TO OBC 2012
AMENDED 2020

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM10651-21
STRUCTURAL
COMPONENT ONLY

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 1ST FLOOR \Flush Beams\B51(i20612) (Flush Beam)

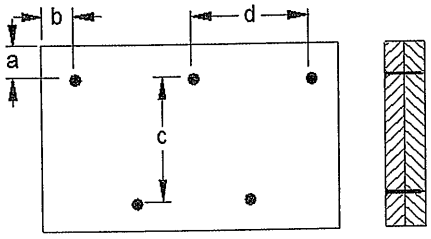
Dry | 1 span | No cant.

May 19, 2021 17:02:13

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - EL A,B,C STAND...RM SUNKEN FOYER.mmdl
Description: 1ST FLOOR \Flush Beams\B51(i20612)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = [illegible]

Calculated Side Load = 468.3 lb/ft
Connectors are: [illegible] Nails
3½" ARDOX SPIRAL

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. YAM/1065/-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

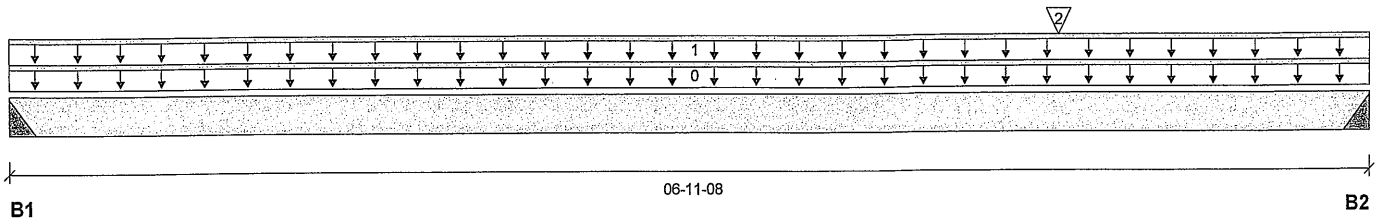
## 1ST FLOOR \Flush Beams\B17E(i25022) (Flush Beam)

Dry | 1 span | No cant.

May 19, 2021 16:40:17

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 1ST FLOOR \Flush Beams\B17E(i25022)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 06-11-08**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 2" | 180 / 0 | 153 / 0 | | |
| B2, 4" | 573 / 0 | 416 / 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 | 06-11-08 | Top | | 12 | | | 00-00-00 |
| 1 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 06-11-08 | Top | 14 | 7 | | | n\a |
| 2 | PBO8(i20297) | Conc. Pt. (lbs) | L | 05-04-04 | 05-04-04 | Top | 656 | 437 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1784 ft-lbs | 35392 ft-lbs | 5.0% | 1 | 05-04-03 |
| End Shear | 1320 lbs | 14464 lbs | 9.1% | 1 | 05-07-10 |
| Total Load Deflection | L/999 (0.008") | n\a | n\a | 4 | 03-09-05 |
| Live Load Deflection | L/999 (0.005") | n\a | n\a | 5 | 03-09-05 |
| Max Defl. | 0.008" | n\a | n\a | 4 | 03-09-05 |
| Span / Depth | 6.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 2" x 3-1/2" | 462 lbs | n\a | 5.4% | HGUS410 |
| B2 | Hanger | 4" x 3-1/2" | 1379 lbs | n\a | 8.1% | HUC410 |

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

## Cautions

Header for the hanger HGUS410 is a Double 1-3/4" x 11-7/8" 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 HUC410 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUC410 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.
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
Calculations assume unbraced length of Top: 00-00-00, Bottom: 06-11-08.

CONFORMS TO OBC 2012
AMENDED 2020

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

BWG NO. TAM10652-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 1ST FLOOR \Flush Beams\B17E(i25022) (Flush Beam)

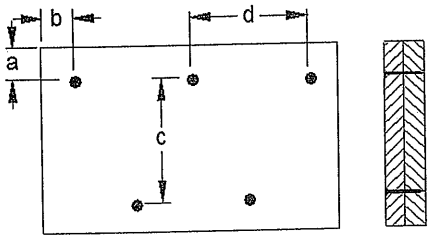
Dry | 1 span | No cant.

May 19, 2021 16:40:17

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 1ST FLOOR \Flush Beams\B17E(i25022)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = [illegible]

Connectors are: [illegible] Nails
3½" ARDOX SPIRAL

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 1065-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

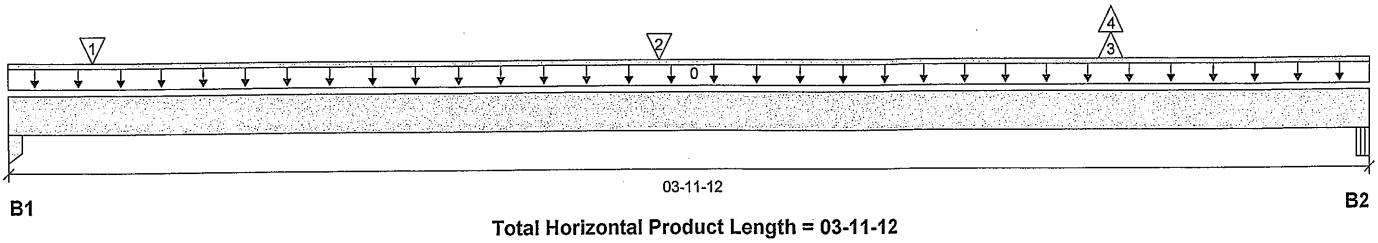
## 1ST FLOOR \Flush Beams\B18E H(i24922) (Flush Beam)

Dry | 1 span | No cant.

May 19, 2021 16:40:17

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 1ST FLOOR \Flush Beams\B18E H(i24922)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 03-11-12**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 1-3/4" | 768 / 22 | 515 / 0 | | |
| B2, 5-1/4" | 270 / 179 | 52 / 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 | 03-11-12 | Top | | 12 | | | 00-00-00 |
| 1 | - | Conc. Pt. (lbs) | L | 00-02-14 | 00-02-14 | Top | 686 | 468 | | | n\a |
| 2 | J4(i25042) | Conc. Pt. (lbs) | L | 01-10-10 | 01-10-10 | Top | 201 | 101 | | | n\a |
| 3 | J4(i24915) | Conc. Pt. (lbs) | L | 03-02-10 | 03-02-10 | Top | 146 | -53 | | | n\a |
| 4 | J4(i24915) | Conc. Pt. (lbs) | L | 03-02-10 | 03-02-10 | Top | -201 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 557 ft-lbs | 35392 ft-lbs | 1.6% | 1 | 01-10-10 |
| Neg. Moment | -88 ft-lbs | -35392 ft-lbs | 0.2% | 4 | 03-02-10 |
| End Shear | 319 lbs | 14464 lbs | 2.2% | 1 | 01-01-10 |
| Total Load Deflection | L/999 (0.001") | n\a | n\a | 6 | 01-09-08 |
| Live Load Deflection | L/999 (0.001") | n\a | n\a | 8 | 01-10-01 |
| Max Defl. | 0.001" | n\a | n\a | 6 | 01-09-08 |
| Span / Depth | 3.6 | | | | |

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Column | 1-3/4" x 3-1/2" | 1796 lbs | 45.1% | 24.0% | Unspecified |
| B2 | Beam | 5-1/4" x 3-1/2" | 470 lbs | 6.0% | 2.1% | Unspecified |
| B2 | Uplift | | 222 lbs | | | |

## Cautions

Uplift of 222 lbs found at bearing B2. (SIMPSON Z-H2.5A @ OS B1+B2) ONLY
Concentrated side load(s) 1 are closer than 18" from end of member. Please consult a technical representative or Professional of Record.

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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
Calculations assume unbraced length of Top: 00-00-00, Bottom: 01-01-08.

CONFORMS TO OBC 2012
AMENDED 2020

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

P6 4

DWG NO. TAM 10653-21
STRUCTURAL
COMPONENT ONLY

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 1ST FLOOR \Flush Beams\B18E H(i24922) (Flush Beam)

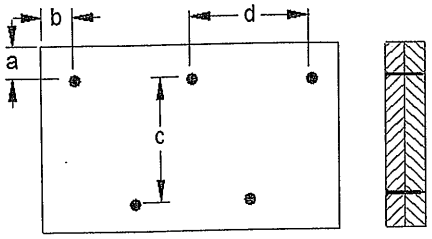
Dry | 1 span | No cant.

May 19, 2021 16:40:17

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 1ST FLOOR \Flush Beams\B18E H(i24922)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 2[illegible]8"

Calculated Side Load = 213.9 lb/ft
Connectors are: [illegible] Nails
3½" ARDOX SPIRAL

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM10653-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

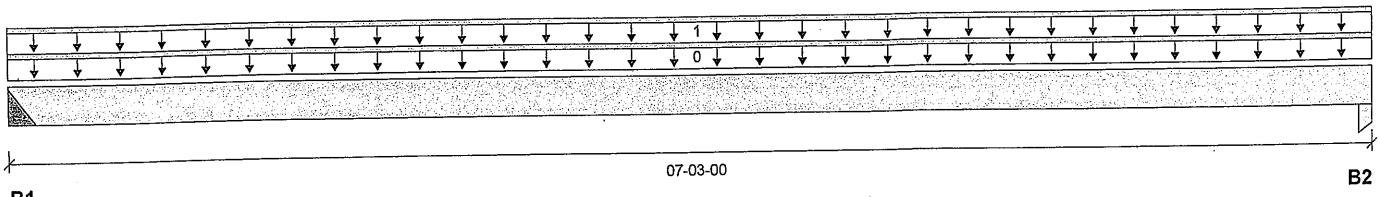
## 1ST FLOOR \Flush Beams\B1E H(i25004) (Flush Beam)

Dry | 1 span | No cant.

May 19, 2021 16:40:17

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 1ST FLOOR \Flush Beams\B1E H(i25004)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 07-03-00**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3" | 23 / 0 | 33 / 0 | | |
| B2, 3-1/2" | 24 / 0 | 34 / 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 | 07-03-00 | Top | | 6 | | | 00-00-00 |
| 1 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-03-00 | Top | 7 | 3 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 124 ft-lbs | 17696 ft-lbs | 0.7% | 1 | 03-07-04 |
| End Shear | 50 lbs | 7232 lbs | 0.7% | 1 | 01-02-14 |
| Total Load Deflection | L/999 (0.002") | n\a | n\a | 4 | 03-07-04 |
| Live Load Deflection | L/999 (0.001") | n\a | n\a | 5 | 03-07-04 |
| Max Defl. | 0.002" | n\a | n\a | 4 | 03-07-04 |
| Span / Depth | 6.9 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 3" x 1-3/4" | 77 lbs | n\a | 1.2% | HUS1.81/10 |
| B2 | Column | 3-1/2" x 1-3/4" | 77 lbs | 1.9% | 1.0% | Unspecified |

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 106542
STRUCTURAL
COMPONENT ONLY

## Cautions

Header for the hanger HUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 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.
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
Calculations assume unbraced length of Top: 00-00-00, Bottom: 06-11-08.

CONFORMS TO OBC 2012
AMENDED 2020

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:

## Disclosure

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

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

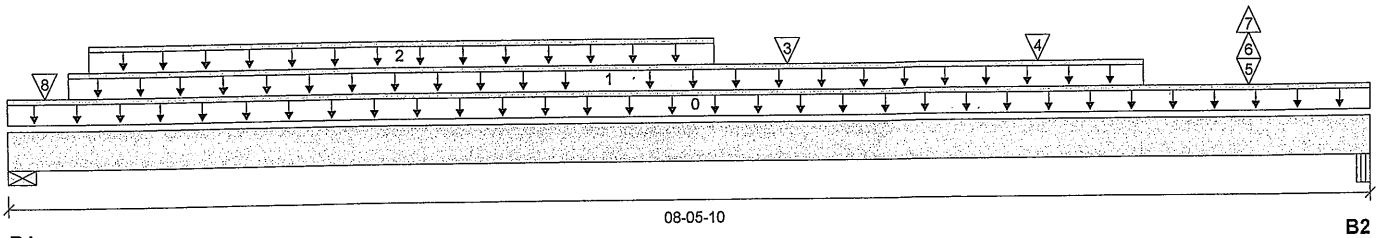
## 1ST FLOOR \Flush Beams\B2E H (i24897) (Flush Beam)

Dry | 1 span | No cant.

May 19, 2021 16:40:17

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 1ST FLOOR \Flush Beams\B2E H (i24897)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 08-05-10**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 3716 / 24 | 2426 / 0 | | |
| B2, 5-1/4" | 1997 / 446 | 816 / 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 | 08-05-10 | Top | | 12 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-04-08 | 07-00-08 | Top | 338 | 169 | | | n\a |
| 2 | STAIRS | Unf. Lin. (lb/ft) | L | 00-06-00 | 04-04-02 | Top | 240 | 120 | | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 04-09-08 | 04-09-08 | Top | 325 | 229 | | | n\a |
| 4 | J4(i25042) | Conc. Pt. (lbs) | L | 06-04-08 | 06-04-08 | Top | 193 | 97 | | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 07-08-08 | 07-08-08 | Top | 453 | 158 | | | n\a |
| 6 | - | Conc. Pt. (lbs) | L | 07-08-08 | 07-08-08 | Top | | -227 | | | n\a |
| 7 | - | Conc. Pt. (lbs) | L | 07-08-08 | 07-08-08 | Top | -470 | | | | n\a |
| 8 | 2(i20298) | Conc. Pt. (lbs) | L | 00-02-12 | 00-02-12 | Top | 1531 | 1258 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 9126 ft-lbs | 35392 ft-lbs | 25.8% | 1 | 04-00-05 |
| End Shear | 4318 lbs | 14464 lbs | 29.9% | 1 | 01-05-06 |
| Total Load Deflection | L/999 (0.07") | n\a | n\a | 6 | 04-02-03 |
| Live Load Deflection | L/999 (0.045") | n\a | n\a | 8 | 04-02-03 |
| Max Defl. | 0.07" | n\a | n\a | 6 | 04-02-03 |
| Span / Depth | 7.8 | | | | |

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
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Per:_____

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 3-1/2" | 8606 lbs | 72.6% | 36.6% | Spruce-Pine-Fir |
| B2 | Beam | 5-1/4" x 3-1/2" | 4015 lbs | 51.2% | 17.9% | Unspecified |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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
Calculations assume unbraced length of Top: 00-00-00, Bottom: 01-01-08.

CONFORMS TO OBC 2012
AMENDED 2020

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. YAM 10655-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 1ST FLOOR \Flush Beams\B2E H (i24897) (Flush Beam)

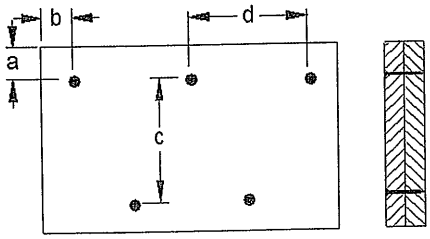
Dry | 1 span | No cant.

May 19, 2021 16:40:17

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 1ST FLOOR \Flush Beams\B2E H (i24897)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member




a minimum = 2" c = 7-7/8"
b minimum = 3" d = 6"

Calculated Side Load = 960.5 lb/ft
Connectors are: Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 10655-21
STRUCTURAL
COMPONENT ONLY

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

## 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® ,

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

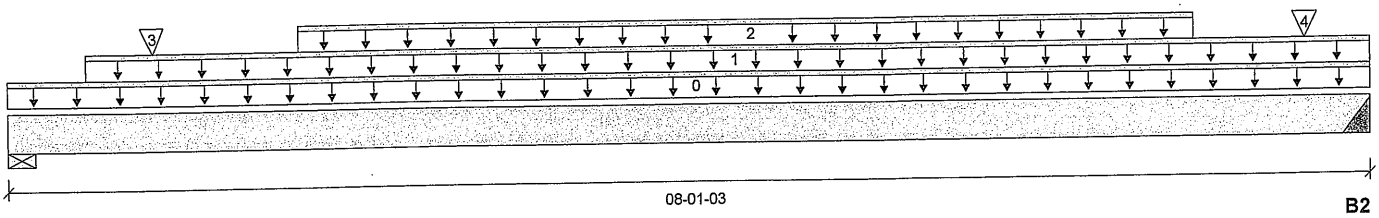
## 2ND FLOOR \Flush Beams\B10E(i24622) (Flush Beam)

Dry | 1 span | No cant.

May 19, 2021 16:40:18

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 2ND FLOOR \Flush Beams\B10E(i24622)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 08-01-03**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 481 / 0 | 871 / 0 | | |
| B2, 3" | 482 / 0 | 523 / 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 | 08-01-03 | Top | | 6 | | | 00-00-00 |
| 1 | WALL | Unf. Lin. (lb/ft) | L | 00-05-08 | 08-01-03 | Top | | 60 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 01-08-08 | 07-00-08 | Top | 126 | 63 | | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 00-10-04 | 00-10-04 | Top | 167 | 489 | | | n\a |
| 4 | J4(i24508) | Conc. Pt. (lbs) | L | 07-08-08 | 07-08-08 | Top | 117 | 59 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2570 ft-lbs | 17696 ft-lbs | 14.5% | 1 | 03-08-08 |
| End Shear | 1205 lbs | 7232 lbs | 16.7% | 1 | 01-05-06 |
| Total Load Deflection | L/999 (0.039") | n\a | n\a | 4 | 04-00-08 |
| Live Load Deflection | L/999 (0.018") | n\a | n\a | 5 | 04-02-08 |
| Max Defl. | 0.039" | n\a | n\a | 4 | 04-00-08 |
| Span / Depth | 7.6 | | | | |

## Bearing Supports

| | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|
| B1 | Wall/Plate 5-1/2" x 1-3/4" | 1220 lbs | 31.7% | 16.0% | Spruce-Pine-Fir |
| B2 | Hanger 3" x 1-3/4" | 1378 lbs | n\a | 21.5% | HUS1.81/10 |

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAW 10656-21
STRUCTURAL COMPONENT ONLY

## Cautions

Header for the hanger HUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 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.
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
Calculations assume unbraced length of Top: 00-00-00, Bottom: 01-01-08.

CONFORMS TO OBC 2012
AMENDED 2020

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

## 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® ,

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

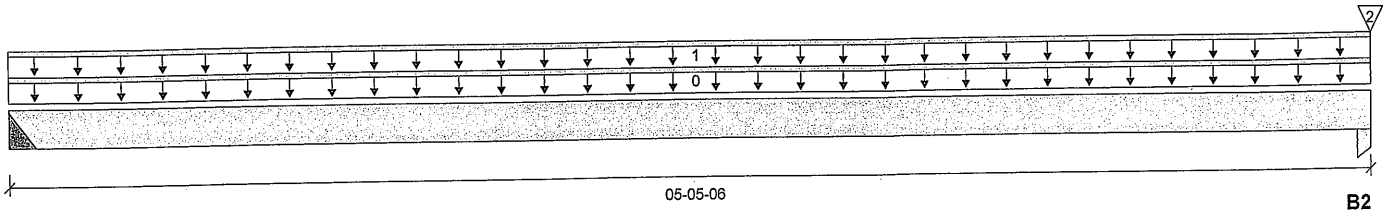
## 2ND FLOOR \Flush Beams\B11E(i24554) (Flush Beam)

Dry | 1 span | No cant.

May 19, 2021 16:40:18

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 2ND FLOOR \Flush Beams\B11E(i24554)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 05-05-06

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3" | 28 / 0 | 30 / 0 | | |
| B2, 3-1/2" | 64 / 0 | 48 / 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 | 05-05-06 | Top | | 6 | | | 00-00-00 |
| 1 | FC2 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 05-05-06 | Top | 10 | 5 | | | n\a |
| 2 | STAIR | Conc. Pt. (lbs) | L | 05-05-06 | 05-05-06 | Top | 35 | 18 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 94 ft-lbs | 17696 ft-lbs | 0.5% | 1 | 02-08-07 |
| End Shear | 43 lbs | 7232 lbs | 0.6% | 1 | 01-02-14 |
| Total Load Deflection | L/999 (0.001") | n\a | n\a | 4 | 02-08-07 |
| Live Load Deflection | L/999 (0") | n\a | n\a | 5 | 02-08-07 |
| Max Defl. | 0.001" | n\a | n\a | 4 | 02-08-07 |
| Span / Depth | 5.1 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 3" x 1-3/4" | 80 lbs | n\a | 1.3% | HUS1.81/10 |
| B2 | Column | 3-1/2" x 1-3/4" | 156 lbs | 3.9% | 2.1% | Unspecified |

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 1065721
STRUCTURAL COMPONENT ONLY

## Cautions

Header for the hanger HUS1.81/10 is a Single 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 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.
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
Calculations assume unbraced length of Top: 00-00-00, Bottom: 05-03-10.

CONFORMS TO OBC 2012
AMENDED 2020

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
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Per:

## Disclosure

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

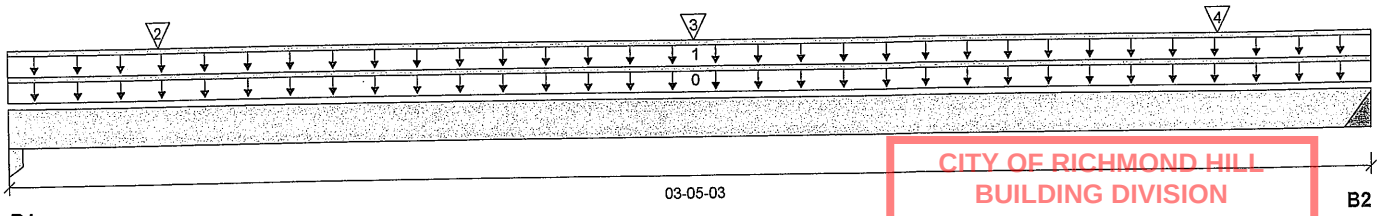
## 2ND FLOOR \Flush Beams\B12E(i24568) (Flush Beam)

Dry | 1 span | No cant.

May 19, 2021 16:40:17

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 2ND FLOOR \Flush Beams\B12E(i24568)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 03-05-03

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 1-3/4" | 573 / 0 | 297 / 0 | | |
| B2, 3" | 608 / 0 | 315 / 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 | 03-05-03 | Top | | 6 | | | 00-00-00 |
| 1 | STAIR | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-05-03 | Top | 240 | 120 | | | n\a |
| 2 | J5(i24469) | Conc. Pt. (lbs) | L | 00-04-08 | 00-04-08 | Top | 104 | 52 | | | n\a |
| 3 | J5(i24553) | Conc. Pt. (lbs) | L | 01-08-08 | 01-08-08 | Top | 149 | 75 | | | n\a |
| 4 | J5(i24596) | Conc. Pt. (lbs) | L | 03-00-08 | 03-00-08 | Top | 104 | 52 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 950 ft-lbs | 17696 ft-lbs | 5.4% | 1 | 01-08-08 |
| End Shear | 474 lbs | 7232 lbs | 6.5% | 1 | 02-02-05 |
| Total Load Deflection | L/999 (0.002") | n\a | n\a | 4 | 01-08-01 |
| Live Load Deflection | L/999 (0.002") | n\a | n\a | 5 | 01-08-01 |
| Max Defl. | 0.002" | n\a | n\a | 4 | 01-08-01 |
| Span / Depth | 3.2 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Column | 1-3/4" x 1-3/4" | 1230 lbs | 61.8% | 32.9% | Unspecified |
| B2 | Hanger | 3" x 1-3/4" | 1305 lbs | n\a | 20.4% | HUS1.81/10 |

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 10658-21
STRUCTURAL
COMPONENT ONLY

## Cautions

Header for the hanger HUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 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.
CONFORMS TO OBC 2012
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86.
AMENDED 2020
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
Calculations assume unbraced length of Top: 00-00-00, Bottom: 01-01-08.

## Disclosure

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

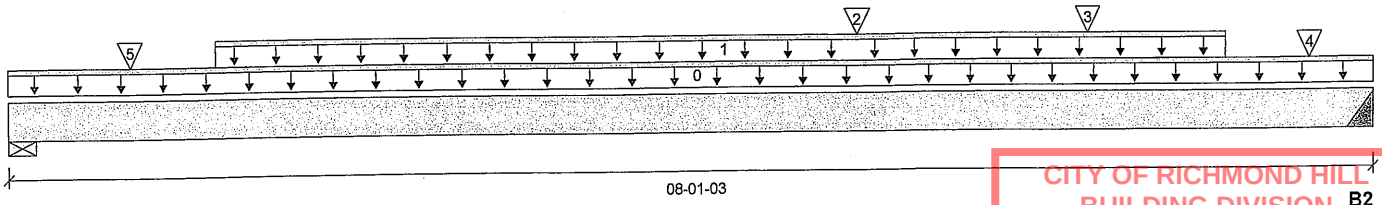
## 2ND FLOOR \Flush Beams\B13E(i24581) (Flush Beam)

Dry | 1 span | No cant.

May 19, 2021 16:40:18

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 2ND FLOOR \Flush Beams\B13E(i24581)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 08-01-03

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 1485 / 0 | 1159 / 0 | | |
| B2, 3" | 1584 / 0 | 846 / 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 | 08-01-03 | Top | | 6 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 01-02-08 | 07-02-08 | Top | 337 | 168 | | | n\a |
| 2 | - | Conc. Pt. (lbs) | L | 04-11-10 | 04-11-10 | Top | 100 | 79 | | | n\a |
| 3 | J5(i24553) | Conc. Pt. (lbs) | L | 06-04-08 | 06-04-08 | Top | 145 | 73 | | | n\a |
| 4 | - | Conc. Pt. (lbs) | L | 07-08-08 | 07-08-08 | Top | 360 | 180 | | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 00-08-08 | 00-08-08 | Top | 407 | 609 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 5929 ft-lbs | 17696 ft-lbs | 33.5% | 1 | 04-08-08 |
| End Shear | 2767 lbs | 7232 lbs | 38.3% | 1 | 06-10-05 |
| Total Load Deflection | L/999 (0.088") | n\a | n\a | 4 | 04-02-09 |
| Live Load Deflection | L/999 (0.056") | n\a | n\a | 5 | 04-02-09 |
| Max Defl. | 0.088" | n\a | n\a | 4 | 04-02-09 |
| Span / Depth | 7.6 | | | | |

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO
DWG NO. FAM 1065921
STRUCTURAL COMPONENT ONLY

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 1-3/4" | 3675 lbs | 62.1% | 31.3% | Spruce-Pine-Fir |
| B2 | Hanger | 3" x 1-3/4" | 3434 lbs | n\a | 53.6% | HUS1.81/10 |

## Cautions

Header for the hanger HUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 and seat length were input by the user. Hanger has not been analyzed for adequate capacity. only

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
CONFORMS TO OBC 2012
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86.
AMENDED 2020
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
Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-09-08.

## Disclosure

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

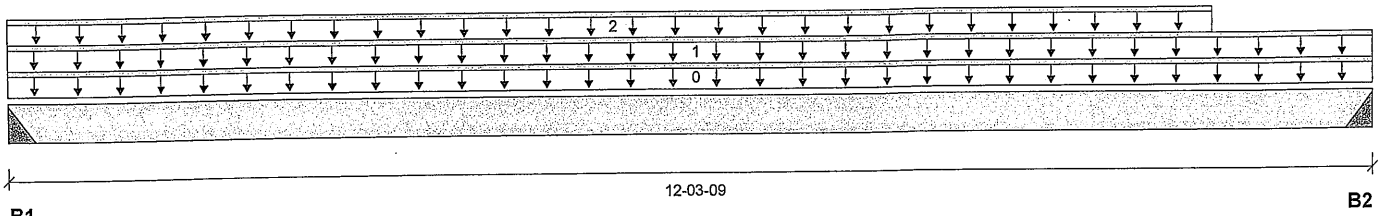
## 2ND FLOOR \Flush Beams\B15(i23401) (Flush Beam)

Dry | 1 span | No cant.

May 19, 2021 16:40:18

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 2ND FLOOR \Flush Beams\B15(i23401)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 12-03-09**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3" | 77 / 0 | 444 / 0 | | |
| B2, 3" | 60 / 0 | 436 / 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 | 12-03-09 | Top | | 6 | | | 00-00-00 |
| 1 | WALL | Unf. Lin. (lb/ft) | L | 00-00-00 | 12-03-09 | Top | | 60 | | | n\a |
| 2 | FC2 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 10-09-14 | Top | 13 | 6 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1796 ft-lbs | 11502 ft-lbs | 15.6% | 0 | 06-02-06 |
| End Shear | 505 lbs | 4701 lbs | 10.8% | 0 | 01-02-14 |
| Total Load Deflection | L/999 (0.079") | n\a | n\a | 4 | 06-02-06 |
| Live Load Deflection | L/999 (0.011") | n\a | n\a | 5 | 06-00-14 |
| Max Defl. | 0.079" | n\a | n\a | 4 | 06-02-06 |
| Span / Depth | 12.0 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 3" x 1-3/4" | 622 lbs | n\a | 14.9% | HUS1.81/10 |
| B2 | Hanger | 3" x 1-3/4" | 610 lbs | n\a | 14.7% | HUS1.81/10 |

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 10660-21
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## Cautions

Header for the hanger HUS1.81/10 is a Single 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 and seat length were input by the user. Hanger has not been analyzed for adequate capacity. OWG

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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
Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-09-08.

CONFORMS TO OBC 2012
AMENDED 2020

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
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Per:_____

## Disclosure

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

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

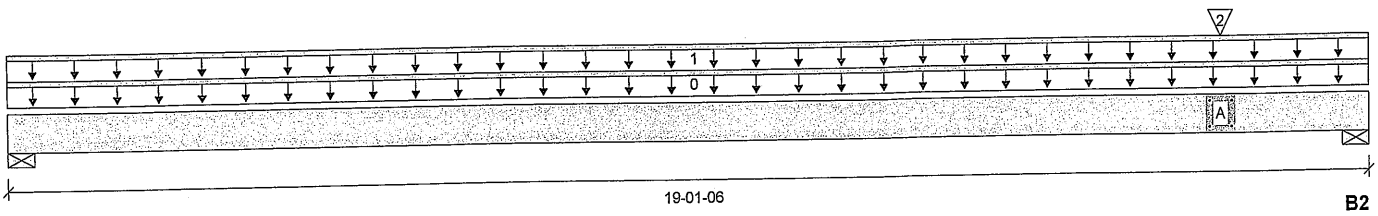
## 2ND FLOOR \Flush Beams\B21E(i24505) (Flush Beam)

Dry | 1 span | No cant.

May 19, 2021 16:40:17

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 2ND FLOOR \Flush Beams\B21E(i24505)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 19-01-06**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4-3/8" | 417 / 0 | 330 / 0 | | |
| B2, 2-3/4" | 1639 / 0 | 985 / 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 | 19-01-06 | Top | | 12 | | | 00-00-00 |
| 1 | FC2 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 19-01-06 | Top | 27 | 13 | | | n\a |
| 2 | B13E(i24581) | Conc. Pt. (lbs) | L | 17-00-02 | 17-00-02 | Top | 1547 | 831 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 7218 ft-lbs | 35392 ft-lbs | 20.4% | 1 | 14-06-12 |
| End Shear | 3637 lbs | 14464 lbs | 25.1% | 1 | 17-10-12 |
| Total Load Deflection | L/696 (0.322") | n\a | 34.5% | 4 | 10-04-14 |
| Live Load Deflection | L/1182 (0.189") | n\a | 30.5% | 5 | 10-04-14 |
| Max Defl. | 0.322" | n\a | n\a | 4 | 10-04-14 |
| Span / Depth | 18.8 | | | | |

## Bearing Supports

| | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|
| B1 | Wall/Plate | 4-3/8" x 3-1/2" | 1039 lbs | 11.0% | 5.6% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 2-3/4" x 3-1/2" | 3691 lbs | 62.4% | 31.5% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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
Calculations assume unbraced length of Top: 00-00-00, Bottom: 16-06-14.

CONFORMS TO OBC 2012
AMENDED 2020

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

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BWG NO. TAM/0661-21
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BUILDING DIVISION
08/12/2021
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Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLOOR \Flush Beams\B21E(i24505) (Flush Beam)

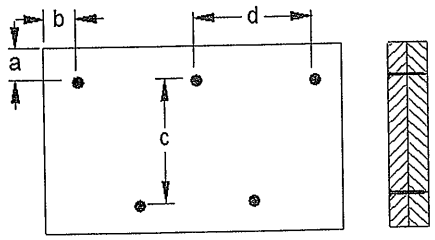
Dry | 1 span | No cant.

May 19, 2021 16:40:17

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 2ND FLOOR \Flush Beams\B21E(i24505)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member

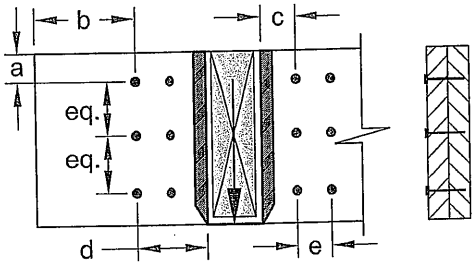



a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = [illegible]

Connectors are: Nails
3½" ARDOX SPIRAL

## Connection Diagrams: Concentrated Side Loads

Connection Tag: A Applies to load tag(s): 3




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

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM/0661-21
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CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

## Disclosure

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

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

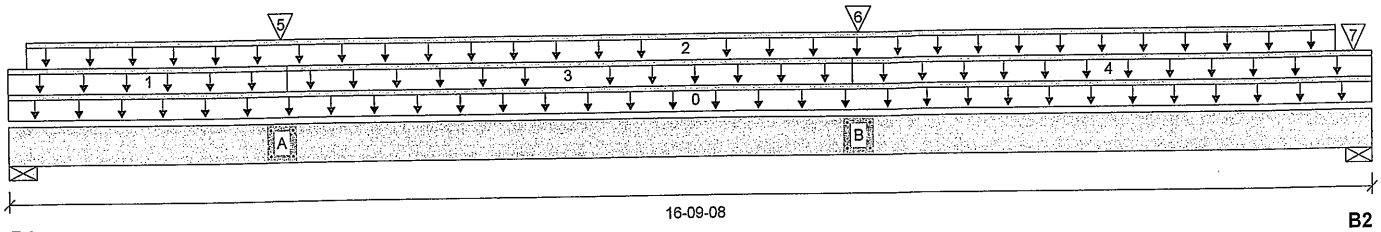
## 2ND FLOOR \Flush Beams\B9E(i24466) (Flush Beam)

Dry | 1 span | No cant.

May 19, 2021 16:40:17

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 2ND FLOOR \Flush Beams\B9E(i24466)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 16-09-08**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 9" | 813 / 0 | 1129 / 0 | | |
| B2, 5-1/2" | 555 / 0 | 1048 / 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 | 16-09-08 | Top | | 12 | | | 00-00-00 |
| 1 | FC2 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-05-00 | Top | 27 | 13 | | | n\a |
| 2 | WALL | Unf. Lin. (lb/ft) | L | 00-02-12 | 16-04-00 | Top | | 60 | | | n\a |
| 3 | FC2 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 03-05-00 | 10-03-03 | Top | 6 | 3 | | | n\a |
| 4 | FC2 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 10-03-03 | 16-09-08 | Top | 27 | 13 | | | n\a |
| 5 | B12E(i24568) | Conc. Pt. (lbs) | L | 03-04-02 | 03-04-02 | Top | 589 | 305 | | | n\a |
| 6 | B10E(i24622) | Conc. Pt. (lbs) | L | 10-04-01 | 10-04-01 | Top | 474 | 527 | | | n\a |
| 7 | E59(i3207) | Conc. Pt. (lbs) | L | 16-06-12 | 16-06-12 | Top | | 24 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 9962 ft-lbs | 35392 ft-lbs | 28.1% | 1 | 10-04-01 |
| End Shear | 2392 lbs | 14464 lbs | 16.5% | 1 | 01-08-14 |
| Total Load Deflection | L/579 (0.326") | n\a | 41.5% | 4 | 08-06-10 |
| Live Load Deflection | L/999 (0.124") | n\a | n\a | 5 | 08-06-10 |
| Max Defl. | 0.326" | n\a | n\a | 4 | 08-06-10 |
| Span / Depth | 15.9 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 9" x 3-1/2" | 2630 lbs | 13.6% | 6.8% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 1468 lbs | 19.1% | 9.6% | Spruce-Pine-Fir |

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BUILDING DIVISION
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## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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
Calculations assume unbraced length of Top: 00-00-00, Bottom: 06-10-03.

CONFORMS TO OBC 2012
AMENDED 2020

PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM10662-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLOOR \Flush Beams\B9E(i24466) (Flush Beam)

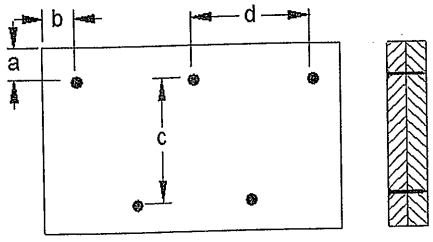
Dry | 1 span | No cant.

May 19, 2021 16:40:17

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - OPTIONS 5 BEDRM.mmdl
Description: 2ND FLOOR \Flush Beams\B9E(i24466)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = [illegible] 8 1/4

Connectors are: [illegible] 3½" ARDOX SPIRAL Nails

CITY OF RICHMOND HILL
BUILDING DIVISION
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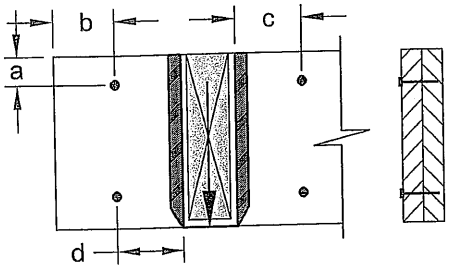
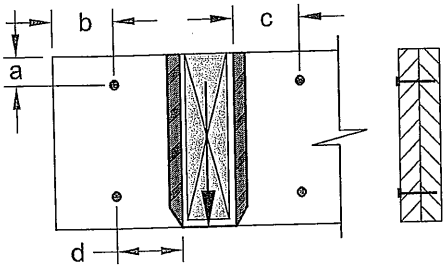
## Connection Diagrams: Concentrated Side Loads

Connection Tag: A Applies to load tag(s): 3




a minimum = 2"
b minimum = 4"
c minimum = 4"
d maximum = 12"
Connectors are: 16d [illegible] Nails
3½" ARDOX SPIRAL

Connection Tag: B Applies to load tag(s): 7




a minimum = 2"
b minimum = 4"
c minimum = 4"
d maximum = 12"
Connectors are: [illegible] Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM10662-21
STRUCTURAL
COMPONENT ONLY

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Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

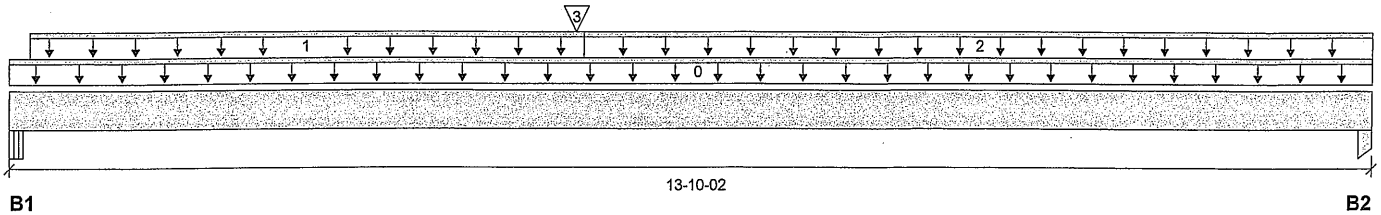
**PASSED**

## 1ST FLOOR \Flush Beams\B1 H(i19242) (Flush Beam)

BC CALC® Member Report | Dry | 1 span | No cant. | August 25, 2020 16:35:39

Build 7493

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C STANDARD.mmdl |
| Address: | | Description: | 1ST FLOOR \Flush Beams\B1 H(i19242) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |




**Total Horizontal Product Length = 13-10-02**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5" | 512 / 0 | 304 / 0 | | |
| B2, 3-1/2" | 336 / 0 | 213 / 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 | 13-10-02 | Top | | 6 | | | 00-00-00 |
| 1 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 00-02-08 | 05-09-03 | Top | 19 | 10 | | | n\a |
| 2 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 05-09-03 | 13-10-02 | Top | 6 | 3 | | | n\a |
| 3 | B2 H(i18641) | Conc. Pt. (lbs) | L | 05-08-05 | 05-08-05 | Top | 689 | 354 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 5393 ft-lbs | 17696 ft-lbs | 30.5% | 1 | 05-08-05 |
| End Shear | 1088 lbs | 7232 lbs | 15.0% | 1 | 01-04-14 |
| Total Load Deflection | L/786 (0.203") | n\a | 30.5% | 4 | 06-07-06 |
| Live Load Deflection | L/1241 (0.128") | n\a | 29.0% | 5 | 06-07-06 |
| Max Defl. | 0.203" | n\a | n\a | 4 | 06-07-06 |
| Span / Depth | 13.4 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 5" x 1-3/4" | 1148 lbs | 24.6% | 10.8% | Unspecified |
| B2 | Column | 3-1/2" x 1-3/4" | 770 lbs | 15.5% | 10.3% | 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 DIVISION
08/12/2021
RECEIVED
Per:_____

LICENSED PROFESSIONAL ENGINEER
4154
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 8760-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

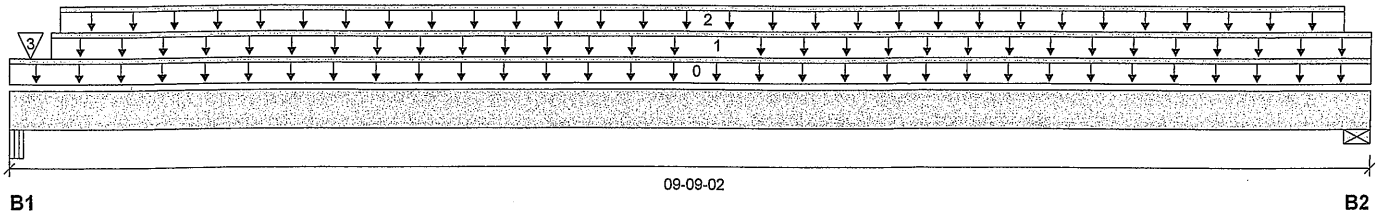
**PASSED**

## 1ST FLOOR \Flush Beams\B16 H(i18656) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 25, 2020 16:35:39

Build 7493

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C STANDARD.mmdl |
| Address: | | Description: | 1ST FLOOR \Flush Beams\B16 H(i18656) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |




**Total Horizontal Product Length = 09-09-02**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4-1/4" | 142 / 0 | 389 / 0 | | |
| B2, 2-3/8" | 75 / 0 | 343 / 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 | 09-09-02 | Top | | 6 | | | 00-00-00 |
| 1 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 00-03-08 | 09-09-02 | Top | 16 | 8 | | | n\a |
| 2 | WALL | Unf. Lin. (lb/ft) | L | 00-04-04 | 09-06-12 | Top | | 60 | | | n\a |
| 3 | 8(i736) | Conc. Pt. (lbs) | L | 00-01-12 | 00-01-12 | Top | 68 | 46 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1125 ft-lbs | 11502 ft-lbs | 9.8% | 0 | 04-11-08 |
| End Shear | 374 lbs | 4701 lbs | 7.9% | 0 | 01-04-02 |
| Total Load Deflection | L/999 (0.031") | n\a | n\a | 4 | 04-11-08 |
| Live Load Deflection | L/999 (0.005") | n\a | n\a | 5 | 04-11-08 |
| Max Defl. | 0.031" | n\a | n\a | 4 | 04-11-08 |
| Span / Depth | 9.4 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 4-1/4" x 1-3/4" | 545 lbs | 21.1% | 9.2% | Unspecified |
| B2 | Wall/Plate | 2-3/8" x 1-3/4" | 480 lbs | 28.9% | 14.6% | Spruce-Pine-Fir |

LICENSED PROFESSIONAL ENGINEER
4144
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 876-21
STRUCTURAL
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## 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
08/12/2021
RECEIVED
Per:_____

## Disclosure

Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

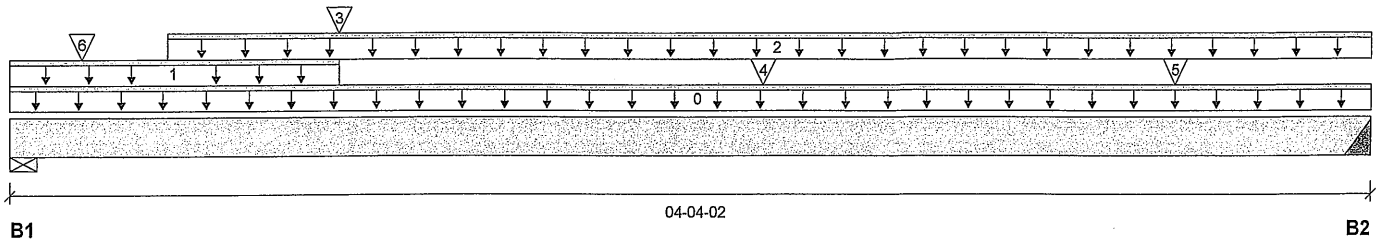
**PASSED**

## 1ST FLOOR \Flush Beams\B2 H(i18641) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 25, 2020 16:35:39

Build 7493

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C STANDARD.mmdl |
| Address: | | Description: | 1ST FLOOR \Flush Beams\B2 H(i18641) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |




**Total Horizontal Product Length = 04-04-02**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 663 / 0 | 405 / 0 | | |
| B2, 3" | 725 / 0 | 375 / 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 | 04-04-02 | Top | | 6 | | | 00-00-00 |
| 1 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-00-08 | Top | 23 | 11 | | | n\a |
| 2 | STAIRS | Unf. Lin. (lb/ft) | L | 00-06-00 | 04-04-02 | Top | 240 | 120 | | | n\a |
| 3 | J6(i19022) | Conc. Pt. (lbs) | L | 01-00-08 | 01-00-08 | Top | 131 | 65 | | | n\a |
| 4 | J6(i19210) | Conc. Pt. (lbs) | L | 02-04-08 | 02-04-08 | Top | 149 | 74 | | | n\a |
| 5 | J6(i19024) | Conc. Pt. (lbs) | L | 03-08-08 | 03-08-08 | Top | 114 | 57 | | | n\a |
| 6 | 7(i702) | Conc. Pt. (lbs) | L | 00-02-12 | 00-02-12 | Top | 49 | 85 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1456 ft-lbs | 17696 ft-lbs | 8.2% | 1 | 02-04-08 |
| End Shear | 1230 lbs | 7232 lbs | 17.0% | 1 | 01-03-06 |
| Total Load Deflection | L/999 (0.006") | n\a | n\a | 4 | 02-02-00 |
| Live Load Deflection | L/999 (0.004") | n\a | n\a | 5 | 02-02-00 |
| Max Defl. | 0.006" | n\a | n\a | 4 | 02-02-00 |
| Span / Depth | 4.0 | | | | |

CITY OF RICHMOND HILL
BUILDING DIVISION
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Per:_____

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 1-3/4" | 1500 lbs | 39.8% | 20.1% | Spruce-Pine-Fir |
| B2 | Hanger | 3" x 1-3/4" | 1557 lbs | n\a | 24.3% | HUS1.81/10 |

## Cautions

Header for the hanger HUS1.81/10 is a Single 1-3/4" x 11-7/8" LVL Beam.

Hanger model HUS1.81/10 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

LICENSED PROFESSIONAL ENGINEER
4154
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 8765-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

## 1ST FLOOR \Flush Beams\B2 H(i18641) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 25, 2020 16:35:39
Build 7493

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C STANDARD.mmdl |
| Address: | | Description: | 1ST FLOOR \Flush Beams\B2 H(i18641) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | 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: 00-00-00, Bottom: 00-00-00.
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

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO
4137
DWG NO. TAM 0765-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

Boise Cascade

# Triple 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

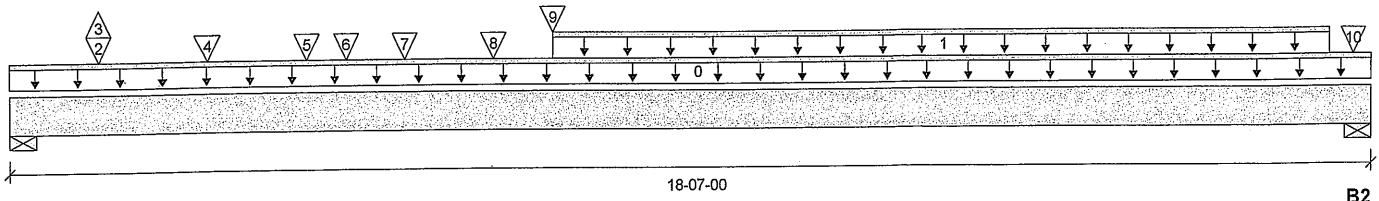
## 2ND FLOOR \Dropped Beams\B14 DR(i18631) (Dropped Beam)

Dry | 1 span | No cant.

August 25, 2020 16:35:39

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - EL A,B,C STANDARD.mmdl
Description: 2ND FLOOR \Dropped Beams\B14 DR(i18631)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 18-07-00

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 4531 / 12 | 2911 / 0 | | |
| B2, 3-1/2" | 4751 / 0 | 2696 / 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 | 18-07-00 | Top | | 21 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 07-04-00 | 18-00-00 | Top | 506 | 253 | | | n\a |
| 2 | - | Conc. Pt. (lbs) | L | 01-02-09 | 01-02-09 | Top | 723 | 432 | | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 01-02-09 | 01-02-09 | Top | -12 | | | | n\a |
| 4 | - | Conc. Pt. (lbs) | L | 02-08-00 | 02-08-00 | Top | 619 | 310 | | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 04-00-00 | 04-00-00 | Top | 532 | 266 | | | n\a |
| 6 | B9(i18715) | Conc. Pt. (lbs) | L | 04-06-07 | 04-06-07 | Top | 333 | 664 | | | n\a |
| 7 | - | Conc. Pt. (lbs) | L | 05-04-00 | 05-04-00 | Top | 585 | 292 | | | n\a |
| 8 | - | Conc. Pt. (lbs) | L | 06-06-07 | 06-06-07 | Top | 613 | 306 | | | n\a |
| 9 | J3(i18883) | Conc. Pt. (lbs) | L | 07-04-00 | 07-04-00 | Top | 241 | 121 | | | n\a |
| 10 | J3(i18753) | Conc. Pt. (lbs) | L | 18-04-00 | 18-04-00 | Top | 241 | 121 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 48265 ft-lbs | 75349 ft-lbs | 64.1% | 1 | 09-04-00 |
| End Shear | 10057 lbs | 25578 lbs | 39.3% | 1 | 01-05-08 |
| Total Load Deflection | L/257 (0.846") | n\a | 93.3% | 6 | 09-04-00 |
| Live Load Deflection | L/411 (0.529") | n\a | 87.6% | 8 | 09-04-00 |
| Max Defl. | 0.846" | n\a | n\a | 6 | 09-04-00 |
| Span / Depth | 15.5 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 5-1/4" | 10435 lbs | 42.6% | 46.5% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 3-1/2" x 5-1/4" | 10496 lbs | 42.8% | 46.8% | 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

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM8767-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Triple 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

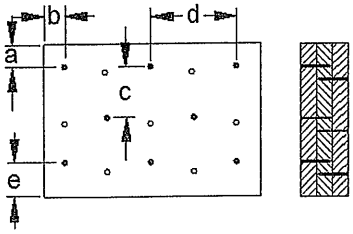
## 2ND FLOOR \Dropped Beams\B14 DR(i18631) (Dropped Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 25, 2020 16:35:39

Build 7493

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C STANDARD.mmdl |
| Address: | | Description: | 2ND FLOOR \Dropped Beams\B14 DR(i18631) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 5"
d = 24"
e minimum = 3"

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

3½" ARDOX SPIRAL

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. YAM 8761-21
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.

Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

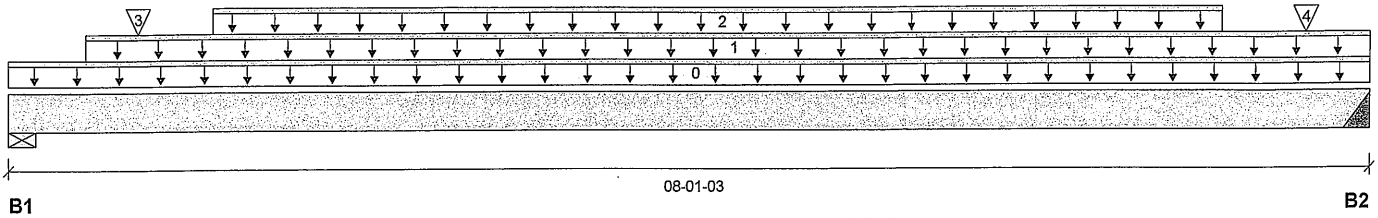
## 2ND FLOOR \Flush Beams\B10(i19261) (Flush Beam)

Dry | 1 span | No cant.

August 25, 2020 16:35:39

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - EL A,B,C STANDARD.mmdl
Description: 2ND FLOOR \Flush Beams\B10(i19261)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 08-01-03**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 555 / 0 | 909 / 0 | | |
| B2, 3" | 485 / 0 | 525 / 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 | 08-01-03 | Top | | 6 | | | 00-00-00 |
| 1 | WALL | Unf. Lin. (lb/ft) | L | 00-05-08 | 08-01-03 | Top | | 60 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 01-02-08 | 07-02-08 | Top | 126 | 62 | | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 00-09-04 | 00-09-04 | Top | 185 | 499 | | | n\a |
| 4 | J6(i18791) | Conc. Pt. (lbs) | L | 07-08-08 | 07-08-08 | Top | 96 | 48 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2599 ft-lbs | 17696 ft-lbs | 14.7% | 1 | 03-08-08 |
| End Shear | 1263 lbs | 7232 lbs | 17.5% | 1 | 01-05-06 |
| Total Load Deflection | L/999 (0.04") | n\a | n\a | 4 | 04-01-00 |
| Live Load Deflection | L/999 (0.019") | n\a | n\a | 5 | 04-01-00 |
| Max Defl. | 0.04" | n\a | n\a | 4 | 04-01-00 |
| Span / Depth | 7.6 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 1-3/4" | 1968 lbs | 33.2% | 16.8% | Spruce-Pine-Fir |
| B2 | Hanger | 3" x 1-3/4" | 1384 lbs | n\a | 21.6% | HUS1.81/10 |

## Cautions

Header for the hanger HUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 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

LICENSED PROFESSIONAL ENGINEERS
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 0768 21
STRUCTURAL
COMPONENT ONLY

CONFORMS TO OBC 2012
AMENDED 2020

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
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Per:_____

## Disclosure

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

Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

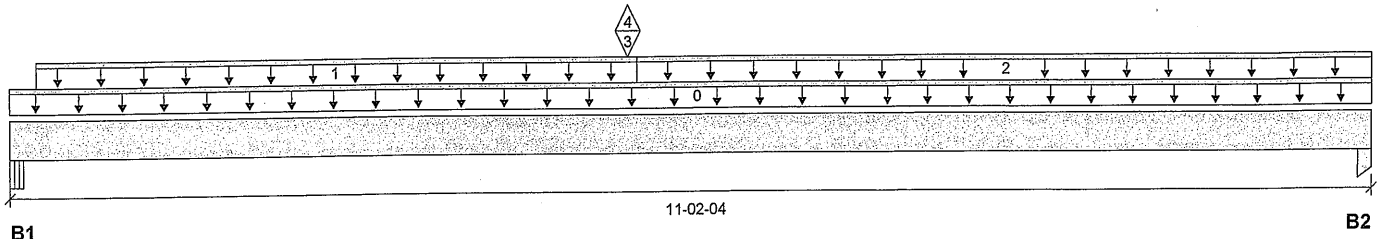
## 2ND FLOOR \Flush Beams\B11(i18661) (Flush Beam)

Dry | 1 span | No cant.

August 25, 2020 16:35:39

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - EL A,B,C STANDARD.mmdl
Description: 2ND FLOOR \Flush Beams\B11(i18661)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 11-02-04**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/4" | 216 / 12 | 179 / 0 | | |
| B2, 3-1/2" | 145 / 10 | 135 / 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 | 11-02-04 | Top | | 6 | | | 00-00-00 |
| 1 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-02-10 | 05-01-03 | Top | 27 | 13 | | | n\a |
| 2 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 05-01-03 | 11-02-04 | Top | 9 | 4 | | | n\a |
| 3 | B13(i18691) | Conc. Pt. (lbs) | L | 05-00-05 | 05-00-05 | Top | 178 | 155 | | | n\a |
| 4 | B13(i18691) | Conc. Pt. (lbs) | L | 05-00-05 | 05-00-05 | Top | -22 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1797 ft-lbs | 17696 ft-lbs | 10.2% | 1 | 05-00-05 |
| End Shear | 468 lbs | 7232 lbs | 6.5% | 1 | 01-05-02 |
| Total Load Deflection | L/999 (0.046") | n\a | n\a | 6 | 05-04-13 |
| Live Load Deflection | L/999 (0.025") | n\a | n\a | 8 | 05-04-13 |
| Max Defl. | 0.046" | n\a | n\a | 6 | 05-04-13 |
| Span / Depth | 10.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 5-1/4" x 1-3/4" | 547 lbs | 4.9% | 4.9% | VL 2.0 3100 SP |
| B2 | Column | 3-1/2" x 1-3/4" | 385 lbs | 7.7% | 5.2% | Unspecified |

## 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: 00-00-00, Bottom: 00-00-00.
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
08/12/2021
RECEIVED
Per:_____

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 6769-21
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.

Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

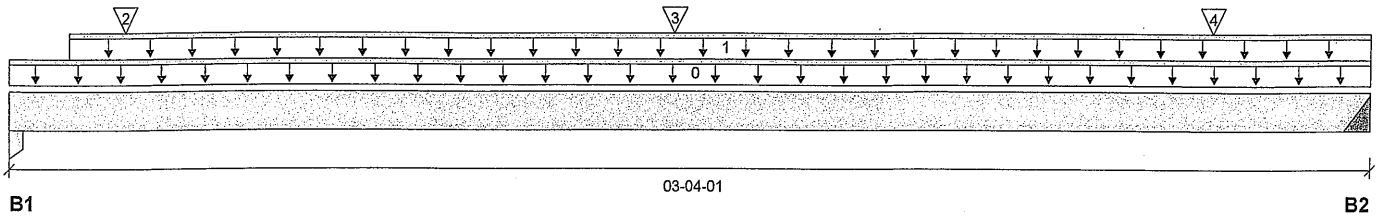
**PASSED**

## 2ND FLOOR \Flush Beams\B12(i19204) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 25, 2020 16:35:39

Build 7493

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C STANDARD.mmdl |
| Address: | | Description: | 2ND FLOOR \Flush Beams\B12(i19204) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |




**Total Horizontal Product Length = 03-04-01**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 1-3/4" | 693 / 0 | 356 / 0 | | |
| B2, 3" | 763 / 0 | 392 / 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 | 03-04-01 | Top | | 6 | | | 00-00-00 |
| 1 | STAIRS | Unf. Lin. (lb/ft) | L | 00-01-12 | 03-04-01 | Top | 240 | 120 | | | n\a |
| 2 | J4(i19241) | Conc. Pt. (lbs) | L | 00-03-06 | 00-03-06 | Top | 192 | 96 | | | n\a |
| 3 | J4(i18835) | Conc. Pt. (lbs) | L | 01-07-06 | 01-07-06 | Top | 293 | 146 | | | n\a |
| 4 | J4(i19253) | Conc. Pt. (lbs) | L | 02-11-06 | 02-11-06 | Top | 205 | 103 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1170 ft-lbs | 17696 ft-lbs | 6.6% | 1 | 01-07-06 |
| End Shear | 619 lbs | 7232 lbs | 8.6% | 1 | 01-01-10 |
| Total Load Deflection | L/999 (0.003") | n\a | n\a | 4 | 01-07-06 |
| Live Load Deflection | L/999 (0.002") | n\a | n\a | 5 | 01-07-06 |
| Max Defl. | 0.003" | n\a | n\a | 4 | 01-07-06 |
| Span / Depth | 3.1 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Column | 1-3/4" x 1-3/4" | 1484 lbs | 59.7% | 39.7% | Unspecified |
| B2 | Hanger | 3" x 1-3/4" | 1636 lbs | n\a | 25.5% | HUS1.81/10 |

LICENSED PROFESSIONAL ENGINEER
4154
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. YAM 8770-21
STRUCTURAL
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## Cautions

Header for the hanger HUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 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

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

## 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.

Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

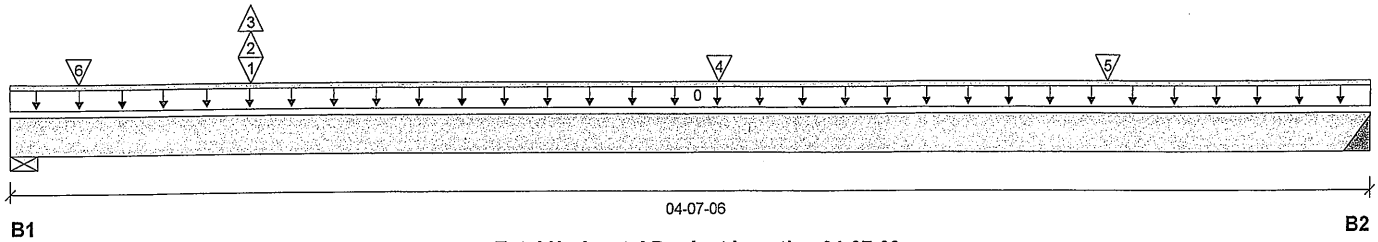
## 2ND FLOOR \Flush Beams\B13(i18691) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 25, 2020 16:35:39

Build 7493

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

File name: 4504 - EL A,B,C STANDARD.mmdl
Description: 2ND FLOOR \Flush Beams\B13(i18691)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 04-07-06**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 287 / 120 | 465 / 0 | | |
| B2, 3" | 183 / 23 | 134 / 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 | 04-07-06 | Top | | 6 | | | 00-00-00 |
| 1 | - | Conc. Pt. (lbs) | L | 00-09-11 | 00-09-11 | Top | 200 | 445 | | | n\a |
| 2 | - | Conc. Pt. (lbs) | L | 00-09-11 | 00-09-11 | Top | | -10 | | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 00-09-11 | 00-09-11 | Top | -143 | | | | n\a |
| 4 | J7(i18832) | Conc. Pt. (lbs) | L | 02-04-08 | 02-04-08 | Top | 130 | 65 | | | n\a |
| 5 | J7(i19223) | Conc. Pt. (lbs) | L | 03-08-08 | 03-08-08 | Top | 111 | 56 | | | n\a |
| 6 | FC3 Floor Material | Conc. Pt. (lbs) | L | 00-02-12 | 00-02-12 | Top | 26 | 13 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 569 ft-lbs | 17696 ft-lbs | 3.2% | 1 | 02-04-08 |
| End Shear | 422 lbs | 7232 lbs | 5.8% | 1 | 01-05-06 |
| Total Load Deflection | L/999 (0.002") | n\a | n\a | 6 | 02-03-13 |
| Live Load Deflection | L/999 (0.001") | n\a | n\a | 8 | 02-04-08 |
| Max Defl. | 0.002" | n\a | n\a | 6 | 02-03-13 |
| Span / Depth | 4.1 | | | | |

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 1-3/4" | 1012 lbs | 17.1% | 8.6% | Spruce-Pine-Fir |
| B2 | Hanger | 3" x 1-3/4" | 441 lbs | n\a | 6.9% | HUS1.81/10 |

## Cautions

Header for the hanger HUS1.81/10 is a Single 1-3/4" x 11-7/8" LVL Beam.

Hanger model HUS1.81/10 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. YAM8771 -21
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

## 2ND FLOOR \Flush Beams\B13(i18691) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 25, 2020 16:35:39

Build 7493

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C STANDARD.mmdl |
| Address: | | Description: | 2ND FLOOR \Flush Beams\B13(i18691) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | 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.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012
AMENDED 2020

LICENSED PROFESSIONAL ENGINEER
S. KATSOUDAKOS
PROVINCE OF ONTARIO

DWG NO. TAM B111 -2L
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® ,

Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

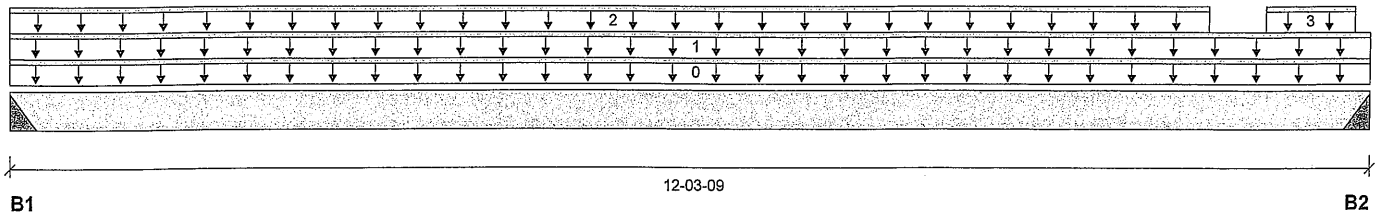
## 2ND FLOOR \Flush Beams\B15(i19154) (Flush Beam)

BC CALC® Member Report
Build 7493

Dry | 1 span | No cant.

August 25, 2020 16:35:39

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C STANDARD.mmdl |
| Address: | | Description: | 2ND FLOOR \Flush Beams\B15(i19154) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |




**Total Horizontal Product Length = 12-03-09**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3" | 78 / 0 | 445 / 0 | | |
| B2, 3" | 70 / 0 | 441 / 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 | 12-03-09 | Top | | 6 | | | 00-00-00 |
| 1 | WALL | Unf. Lin. (lb/ft) | L | 00-00-00 | 12-03-09 | Top | | 60 | | | n\a |
| 2 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 10-09-14 | Top | 13 | 6 | | | n\a |
| 3 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 11-04-02 | 12-01-14 | Top | 13 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1797 ft-lbs | 11502 ft-lbs | 15.6% | 0 | 06-02-06 |
| End Shear | 506 lbs | 4701 lbs | 10.8% | 0 | 01-02-14 |
| Total Load Deflection | L/999 (0.079") | n\a | n\a | 4 | 06-02-06 |
| Live Load Deflection | L/999 (0.012") | n\a | n\a | 5 | 06-00-14 |
| Max Defl. | 0.079" | n\a | n\a | 4 | 06-02-06 |
| Span / Depth | 12.0 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 3" x 1-3/4" | 622 lbs | n\a | 15.0% | HUS1.81/10 |
| B2 | Hanger | 3" x 1-3/4" | 617 lbs | n\a | 14.8% | HUS1.81/10 |

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 0772-21
STRUCTURAL COMPONENT ONLY

## Cautions

Header for the hanger HUS1.81/10 is a Single 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 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

## Disclosure

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Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

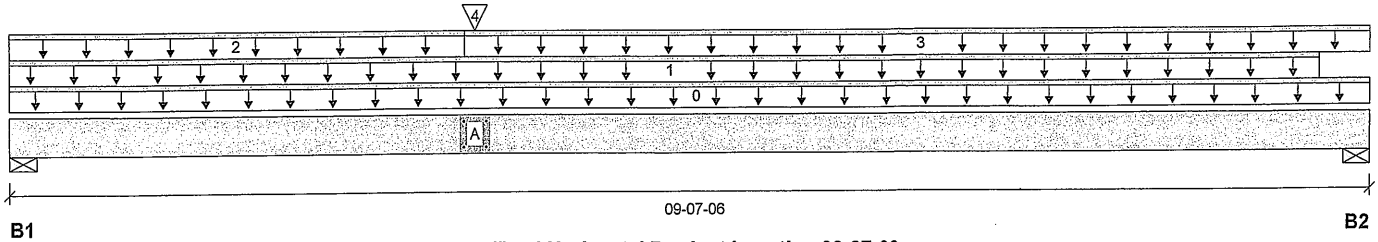
## 2ND FLOOR \Flush Beams\B20(i18684) (Flush Beam)

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

August 25, 2020 16:35:39

File name: 4504 - EL A,B,C STANDARD.mmdl
Description: 2ND FLOOR \Flush Beams\B20(i18684)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 09-07-06

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 2-3/4" | 422 / 0 | 739 / 0 | | |
| B2, 4-3/8" | 287 / 0 | 568 / 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 | 09-07-06 | Top | | 12 | | | 00-00-00 |
| 1 | WALL | Unf. Lin. (lb/ft) | L | 00-00-00 | 09-03-00 | Top | | 60 | | | n\a |
| 2 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-02-03 | Top | 19 | 9 | | | n\a |
| 3 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 03-02-03 | 09-07-06 | Top | 27 | 13 | | | n\a |
| 4 | B10(i19261) | Conc. Pt. (lbs) | L | 03-03-01 | 03-03-01 | Top | 478 | 520 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 4118 ft-lbs | 35392 ft-lbs | 11.6% | 1 | 03-03-01 |
| End Shear | 1398 lbs | 14464 lbs | 9.7% | 1 | 01-02-10 |
| Total Load Deflection | L/999 (0.042") | n\a | n\a | 4 | 04-06-01 |
| Live Load Deflection | L/999 (0.016") | n\a | n\a | 5 | 04-05-02 |
| Max Defl. | 0.042" | n\a | n\a | 4 | 04-06-01 |
| Span / Depth | 9.2 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 2-3/4" x 3-1/2" | 1034 lbs | 26.9% | 13.5% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 4-3/8" x 3-1/2" | 795 lbs | 13.0% | 6.5% | 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

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM8173-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

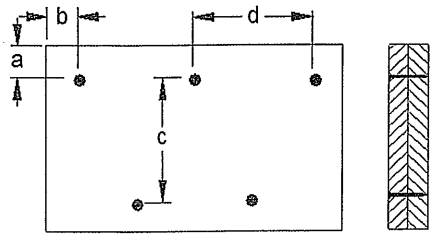
**PASSED**

## 2ND FLOOR \Flush Beams\B20(i18684) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 25, 2020 16:35:39
Build 7493

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C STANDARD.mmdl |
| Address: | | Description: | 2ND FLOOR \Flush Beams\B20(i18684) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |

## Connection Diagram: Full Length of Member

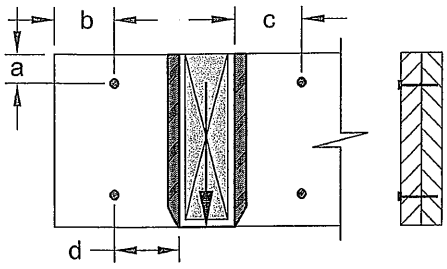



a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 24"

Connectors are: Nails
3½" 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"
Connectors are: 16d Nails
3½" ARDOX SPIRAL


DWG NO. YAM 8773-2L
STRUCTURAL
COMPONENT ONLY

## Disclosure

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

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

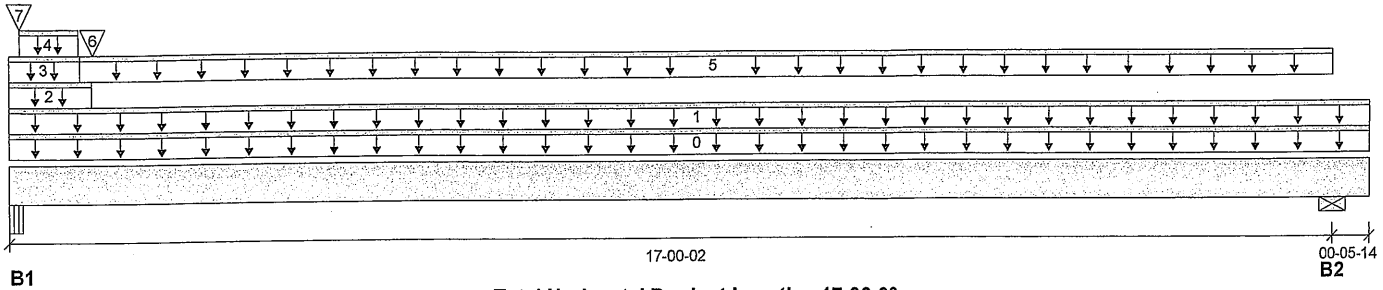
**PASSED**

## 2ND FLOOR \Flush Beams\B7(i19188) (Flush Beam)

BC CALC® Member Report
Build 7493
Dry | 2 spans | R cant.
August 25, 2020 16:35:39

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

File name: 4504 - EL A,B,C STANDARD.mmdl
Description: 2ND FLOOR \Flush Beams\B7(i19188)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 17-06-00**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-7/8" | 1278 / 0 | 1628 / 0 | 1160 / 0 | |
| B2, 5-1/2" | 279 / 0 | 287 / 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 | 17-06-00 | Top | | 12 | | | 00-00-00 |
| 1 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 17-06-00 | Top | 10 | 5 | | | n\a |
| 2 | ROOF | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-00-10 | Top | 33 | 30 | 78 | | n\a |
| 3 | E43(i937) | Unf. Lin. (lb/ft) | L | 00-00-00 | 00-10-14 | Top | | 81 | | | n\a |
| 4 | E43(i937) | Unf. Lin. (lb/ft) | L | 00-01-10 | 00-10-10 | Top | 33 | 30 | 78 | | n\a |
| 5 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-10-14 | 17-00-02 | Top | 16 | 8 | | | n\a |
| 6 | - | Conc. Pt. (lbs) | L | 01-00-13 | 01-00-13 | Top | 1048 | 1334 | 1033 | | n\a |
| 7 | E43(i937) | Conc. Pt. (lbs) | L | 00-01-10 | 00-01-10 | Top | | | 30 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 4604 ft-lbs | 35392 ft-lbs | 13.0% | 2 | 05-07-05 |
| Neg. Moment | -4 ft-lbs | -35392 ft-lbs | n\a | 1 | 17-00-02 |
| End Shear | 3826 lbs | 14464 lbs | 26.5% | 1 | 01-03-12 |
| Cont. Shear | 726 lbs | 14464 lbs | 5.0% | 1 | 15-09-08 |
| Total Load Deflection | L/1095 (0.184") | n\a | 21.9% | 82 | 08-01-03 |
| Live Load Deflection | L/999 (0.103") | n\a | n\a | 120 | 07-10-08 |
| Total Neg. Defl. | 2xL/1998 (-0.016") | n\a | n\a | 82 | 17-06-00 |
| Max Defl. | 0.184" | n\a | n\a | 82 | 08-01-03 |
| Span / Depth | 16.9 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 3-7/8" x 3-1/2" | 5111 lbs | 70.6% | 30.9% | Unspecified |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 831 lbs | 7.0% | 3.5% | Spruce-Pine-Fir |

## Cautions

Concentrated side load(s) 20 are closer than 18" from end of member.Please consult a technical representative or Professional of Record.

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 0774-21
STRUCTURAL
COMPONENT ONLY

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLOOR \Flush Beams\B7(i19188) (Flush Beam)

BC CALC® Member Report — Dry | 2 spans | R cant. — August 25, 2020 16:35:39

Build 7493

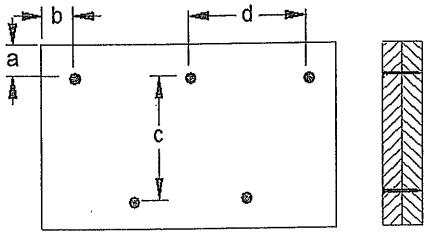
| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C STANDARD.mmdl |
| Address: | | Description: | 2ND FLOOR \Flush Beams\B7(i19188) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |

## 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
Cantilevers require sheathed bottom flanges, blocking at cantilever support and closure at ends.

CONFORMS TO OBC 2012
AMENDED 2020

## Connection Diagram: Full Length of Member




a minimum = 2"  c = 7-7/8"
b minimum = 3"  d = 12"

Calculated Side Load = 465.0 lb/ft
Connectors are: [illegible] Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
4154
S. KATSOUDAKOS
PROVINCE OF ONTARIO

DWG NO. TAM B774-2 L
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® ,

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

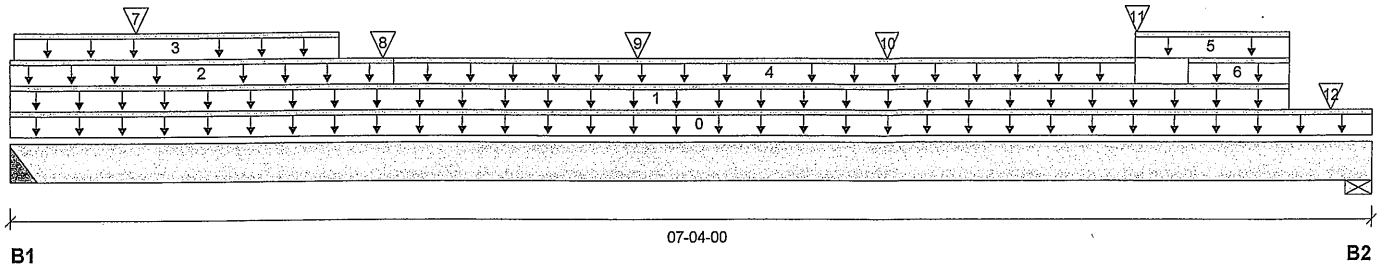
**PASSED**

## 2ND FLOOR \Flush Beams\B8(i19157) (Flush Beam)

BC CALC® Member Report | Dry | 1 span | No cant. | August 25, 2020 16:35:39

Build 7493

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C STANDARD.mmdl |
| Address: | | Description: | 2ND FLOOR \Flush Beams\B8(i19157) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |




**Total Horizontal Product Length = 07-04-00**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 1090 / 0 | 1136 / 0 | 644 / 0 | |
| B2, 5-1/2" | 972 / 0 | 1051 / 0 | 632 / 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 | 07-04-00 | Top | | 12 | | | 00-00-00 |
| 1 | J03 | Unf. Lin. (lb/ft) | L | 00-00-00 | 06-10-08 | Top | | 36 | 69 | | n\a |
| 2 | E75(i3228) | Unf. Lin. (lb/ft) | L | 00-00-00 | 02-00-08 | Top | | 81 | | | n\a |
| 3 | E75(i3228) | Unf. Lin. (lb/ft) | L | 00-00-04 | 01-09-00 | Top | | 46 | 110 | | n\a |
| 4 | E76(i3229) | Unf. Lin. (lb/ft) | L | 02-00-08 | 06-00-08 | Top | | 41 | | | n\a |
| 5 | E42(i931) | Unf. Lin. (lb/ft) | L | 06-00-08 | 06-10-08 | Top | | 81 | | | n\a |
| 6 | E42(i931) | Unf. Lin. (lb/ft) | L | 06-04-00 | 06-10-08 | Top | | 46 | 110 | | n\a |
| 7 | J1(i19246) | Conc. Pt. (lbs) | L | 00-08-00 | 00-08-00 | Top | 352 | 176 | | | n\a |
| 8 | - | Conc. Pt. (lbs) | L | 01-11-13 | 01-11-13 | Top | 433 | 357 | 254 | | n\a |
| 9 | J2(i19095) | Conc. Pt. (lbs) | L | 03-04-00 | 03-04-00 | Top | 433 | 217 | | | n\a |
| 10 | J2(i19277) | Conc. Pt. (lbs) | L | 04-08-00 | 04-08-00 | Top | 433 | 217 | | | n\a |
| 11 | - | Conc. Pt. (lbs) | L | 06-00-09 | 06-00-09 | Top | 401 | 340 | 250 | | n\a |
| 12 | E59(i3207) | Conc. Pt. (lbs) | L | 07-01-04 | 07-01-04 | Top | | 43 | 48 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 5581 ft-lbs | 35392 ft-lbs | 15.8% | 1 | 03-04-00 |
| End Shear | 2951 lbs | 14464 lbs | 20.4% | 1 | 05-10-10 |
| Total Load Deflection | L/999 (0.035") | n\a | n\a | 35 | 03-07-00 |
| Live Load Deflection | L/999 (0.021") | n\a | n\a | 51 | 03-07-00 |
| Max Defl. | 0.035" | n\a | n\a | 35 | 03-07-00 |
| Span / Depth | 6.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 3699 lbs | n\a | 21.7% | HGUS410 |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 3404 lbs | 28.7% | 14.5% | Spruce-Pine-Fir |

## Cautions

Header for the hanger HGUS410 is a Double 1-3/4" x 11-7/8" LVL Beam.

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

LICENSED PROFESSIONAL ENGINEER
4154
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. YAM 8775-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLOOR \Flush Beams\B8(i19157) (Flush Beam)

Dry | 1 span | No cant.

August 25, 2020 16:35:39

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

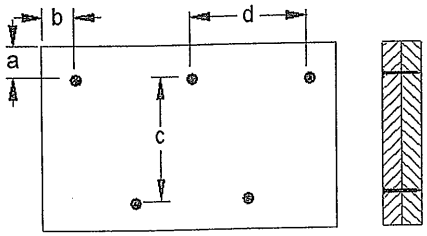
File name: 4504 - EL A,B,C STANDARD.mmdl
Description: 2ND FLOOR \Flush Beams\B8(i19157)
Specifier:
Designer: L.D.
Company:

## 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 = 7-7/8"
d = 6"

Calculated Side Load = 920.8 lb/ft
Connectors are: [illegible] Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM8775-2L
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

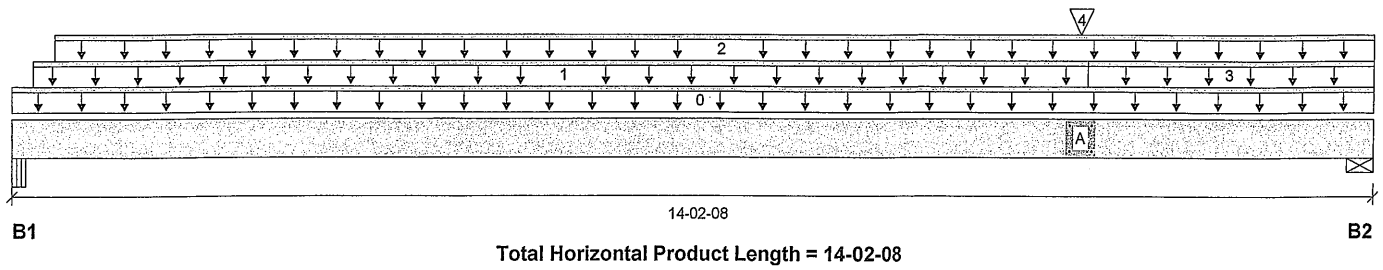
**PASSED**

## 2ND FLOOR \Flush Beams\B9(i18715) (Flush Beam)

BC CALC® Member Report | Dry | 1 span | No cant. | August 25, 2020 16:35:39

Build 7493

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C STANDARD.mmdl |
| Address: | | Description: | 2ND FLOOR \Flush Beams\B9(i18715) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |




**Total Horizontal Product Length = 14-02-08**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/4" | 337 / 0 | 664 / 0 | | |
| B2, 2-3/4" | 727 / 0 | 876 / 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 | 14-02-08 | Top | | 12 | | | 00-00-00 |
| 1 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-02-10 | 11-02-04 | Top | 27 | 13 | | | n\a |
| 2 | WALL | Unf. Lin. (lb/ft) | L | 00-05-04 | 14-02-08 | Top | | 60 | | | n\a |
| 3 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 11-02-04 | 14-02-08 | Top | 19 | 9 | | | n\a |
| 4 | B12(i19204) | Conc. Pt. (lbs) | L | 11-01-06 | 11-01-06 | Top | 715 | 368 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 5991 ft-lbs | 35392 ft-lbs | 16.9% | 1 | 09-05-06 |
| End Shear | 2028 lbs | 14464 lbs | 14.0% | 1 | 12-11-14 |
| Total Load Deflection | L/1086 (0.151") | n\a | 22.1% | 4 | 07-05-13 |
| Live Load Deflection | L/999 (0.062") | n\a | n\a | 5 | 07-09-07 |
| Max Defl. | 0.151" | n\a | n\a | 4 | 07-05-13 |
| Span / Depth | 13.8 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 5-1/4" x 3-1/2" | 929 lbs | 6.4% | 6.4% | VL 2.0 3100 SP |
| B2 | Wall/Plate | 2-3/4" x 3-1/2" | 2186 lbs | 36.9% | 18.6% | 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

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 8776-2L
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLOOR \Flush Beams\B9(i18715) (Flush Beam)

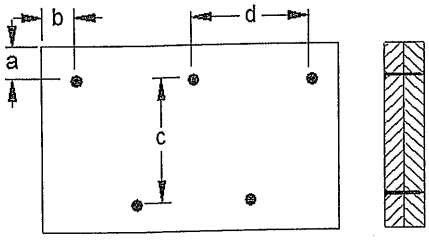
BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

August 25, 2020 16:35:39

File name: 4504 - EL A,B,C STANDARD.mmdl
Description: 2ND FLOOR \Flush Beams\B9(i18715)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member

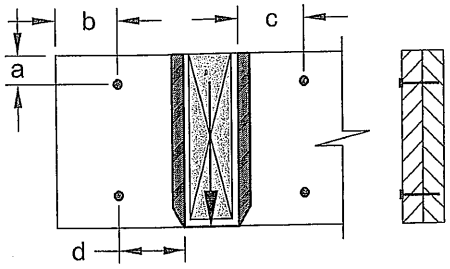



a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 24"

Connectors are: [illegible] Nails
3½" ARDOX SPIRAL

## Connection Diagrams: Concentrated Side Loads

Connection Tag: A ~~Applies to load tag~~(s): 3




a minimum = 2"
b minimum = 4"
c minimum = 4"
d maximum = 12"
Connectors are: 16d [illegible] Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
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PROVINCE OF ONTARIO

DWG NO. YAM 8026-2L
STRUCTURAL
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BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

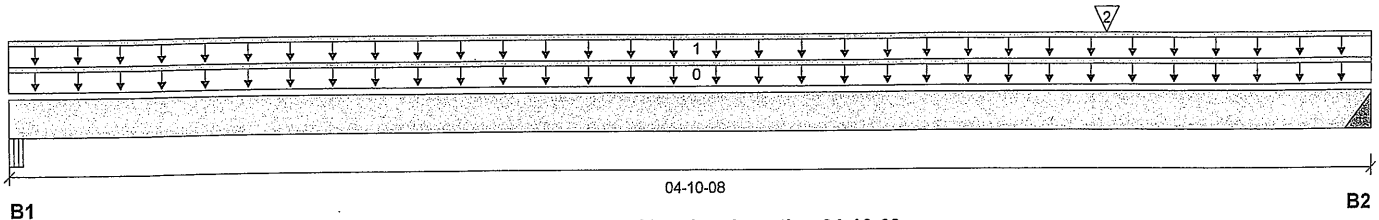
## 1ST FLOOR \Flush Beams\B17E(i23447) (Flush Beam)

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

August 26, 2020 10:53:26

File name: 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl
Description: 1ST FLOOR \Flush Beams\B17E(i23447)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 04-10-08

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 2-5/8" | 138 / 0 | 115 / 0 | | |
| B2, 4" | 610 / 0 | 429 / 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 | 04-10-08 | Top | | 12 | | | 00-00-00 |
| 1 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 04-10-08 | Top | 14 | 7 | | | n\a |
| 2 | PBO8(i20297) | Conc. Pt. (lbs) | L | 03-11-00 | 03-11-00 | Top | 680 | 451 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 979 ft-lbs | 35392 ft-lbs | 2.8% | 1 | 03-11-00 |
| End Shear | 808 lbs | 14464 lbs | 5.6% | 1 | 03-06-10 |
| Total Load Deflection | L/999 (0.002") | n\a | n\a | 4 | 02-08-01 |
| Live Load Deflection | L/999 (0.001") | n\a | n\a | 5 | 02-08-01 |
| Max Defl. | 0.002" | n\a | n\a | 4 | 02-08-01 |
| Span / Depth | 4.5 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 2-5/8" x 3-1/2" | 351 lbs | 9.0% | 3.1% | Unspecified |
| B2 | Hanger | 4" x 3-1/2" | 1450 lbs | n\a | 8.5% | HUC410 |

## Cautions

Header for the hanger HUC410 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUC410 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

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM B777-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

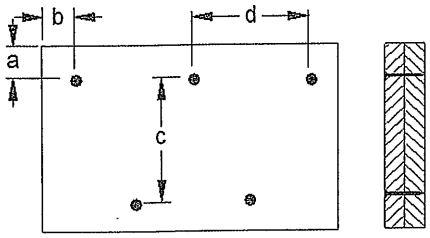
**PASSED**

## 1ST FLOOR \Flush Beams\B17E(i23447) (Flush Beam)

BC CALC® Member Report
Build 7493
Dry | 1 span | No cant.
August 26, 2020 10:53:26

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl |
| Address: | | Description: | 1ST FLOOR \Flush Beams\B17E(i23447) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 24"

Connectors are: [illegible] Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
S. KATSOUDAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 877-21
STRUCTURAL
COMPONENT ONLY

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Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

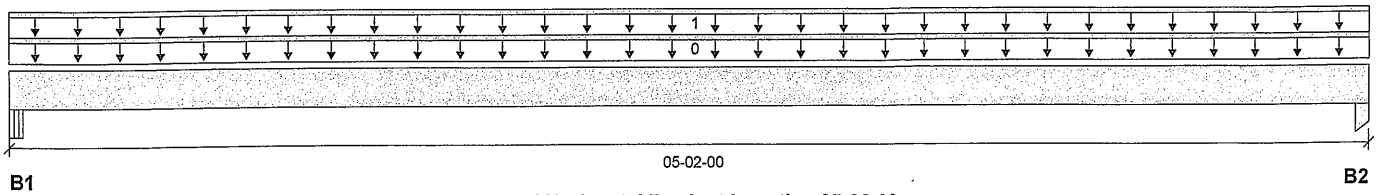
## 1ST FLOOR \Flush Beams\B1E H(i23528) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 26, 2020 10:53:26

Build 7493

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

File name: 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl
Description: 1ST FLOOR \Flush Beams\B1E H(i23528)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 05-02-00

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 2-5/8" | 16 / 0 | 24 / 0 | | |
| B2, 3-1/2" | 17 / 0 | 24 / 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 | 05-02-00 | Top | | 6 | | | 00-00-00 |
| 1 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 05-02-00 | Top | 6 | 3 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 61 ft-lbs | 17696 ft-lbs | 0.3% | 1 | 02-06-09 |
| End Shear | 28 lbs | 7232 lbs | 0.4% | 1 | 01-02-08 |
| Total Load Deflection | L/999 (0") | n\a | n\a | 4 | 02-06-09 |
| Live Load Deflection | L/999 (0") | n\a | n\a | 5 | 02-06-09 |
| Max Defl. | 0" | n\a | n\a | 4 | 02-06-09 |
| Span / Depth | 4.8 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 2-5/8" x 1-3/4" | 54 lbs | 2.8% | 1.0% | Unspecified |
| B2 | Column | 3-1/2" x 1-3/4" | 56 lbs | 1.4% | 0.7% | Unspecified |

LICENCED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. YAM 6774-21
STRUCTURAL
COMPONENT ONLY

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
CONFORMS TO OBC 2012
Calculations assume member is fully braced.
Resistance Factor phi has been applied to all presented results per CSA O86.
AMENDED 2020
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

## Disclosure

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

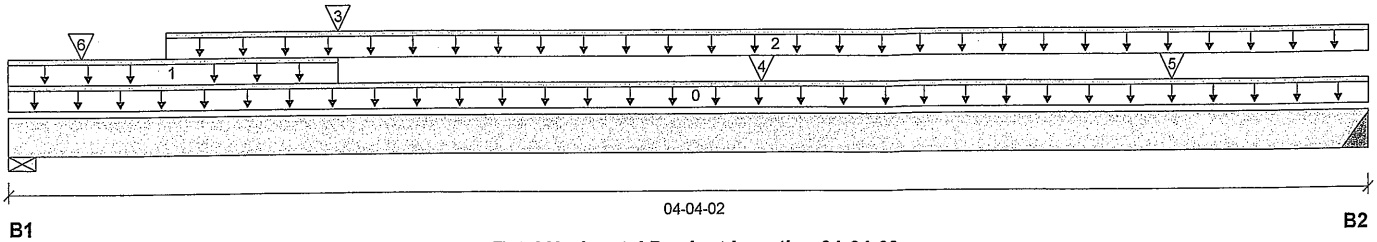
## 1ST FLOOR \Flush Beams\B2E H (i23572) (Flush Beam)

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

August 26, 2020 10:53:26

File name: 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl
Description: 1ST FLOOR \Flush Beams\B2E H (i23572)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 04-04-02**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 1039 / 0 | 568 / 0 | | |
| B2, 4" | 1234 / 0 | 644 / 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 | 04-04-02 | Top | | 12 | | | 00-00-00 |
| 1 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-00-08 | Top | 23 | | | | n\a |
| 2 | STAIRS | Unf. Lin. (lb/ft) | L | 00-06-00 | 04-04-02 | Top | 240 | 120 | | | n\a |
| 3 | J1(i23624) | Conc. Pt. (lbs) | L | 01-00-08 | 01-00-08 | Top | 467 | 233 | | | n\a |
| 4 | J1(i23654) | Conc. Pt. (lbs) | L | 02-04-08 | 02-04-08 | Top | 478 | 239 | | | n\a |
| 5 | J1(i23639) | Conc. Pt. (lbs) | L | 03-08-08 | 03-08-08 | Top | 379 | 190 | | | n\a |
| 6 | 2(i20298) | Conc. Pt. (lbs) | L | 00-02-12 | 00-02-12 | Top | | 25 | | | n\a |

## Controls Summary

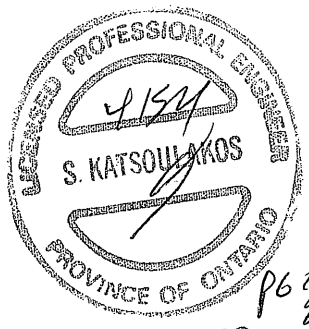
| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2436 ft-lbs | 35392 ft-lbs | 6.9% | 1 | 02-04-08 |
| End Shear | 1957 lbs | 14464 lbs | 13.5% | 1 | 01-03-06 |
| Total Load Deflection | L/999 (0.005") | n\a | n\a | 4 | 02-01-10 |
| Live Load Deflection | L/999 (0.003") | n\a | n\a | 5 | 02-01-10 |
| Max Defl. | 0.005" | n\a | n\a | 4 | 02-01-10 |
| Span / Depth | 3.9 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 3-1/2" | 2269 lbs | 30.1% | 15.2% | Spruce-Pine-Fir |
| B2 | Hanger | 4" x 3-1/2" | 2656 lbs | n\a | 15.5% | HGUS410 |

## Cautions

Header for the hanger HGUS410 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.




DWG NO. TAM 8780-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

## 1ST FLOOR \Flush Beams\B2E H (i23572) (Flush Beam)

Dry | 1 span | No cant.

August 26, 2020 10:53:26

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl
Description: 1ST FLOOR \Flush Beams\B2E H (i23572)
Specifier:
Designer: L.D.
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.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

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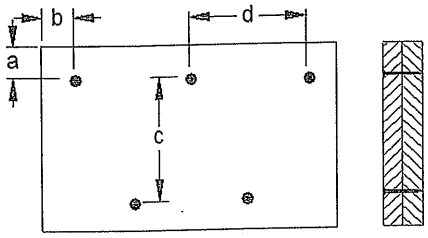
## Connection Diagram: Full Length of Member




a minimum = 2" c = 7-7/8"
b minimum = 3" d = 12"

Calculated Side Load = 495.9 lb/ft
Connectors are: [illegible] Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 0780-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

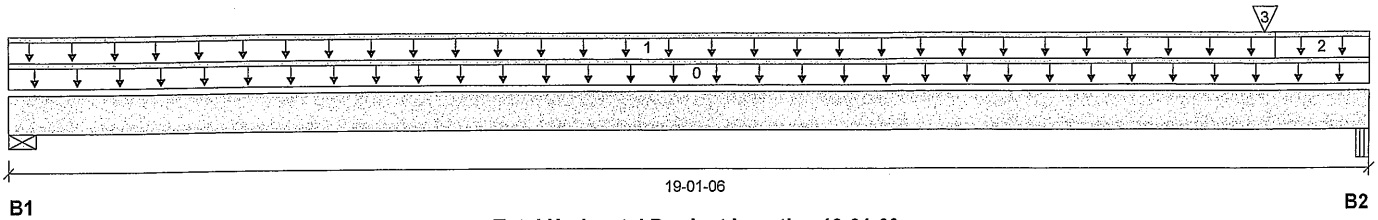
## 1ST FLOOR \Flush Beams\B41 E(i23552) (Flush Beam)

BC CALC® Member Report | Dry | 1 span | No cant. | August 26, 2020 10:53:26

Build 7493

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

File name: 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl
Description: 1ST FLOOR \Flush Beams\B41 E(i23552)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 19-01-06**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 2-3/8" | 337 / 0 | 285 / 0 | | |
| B2, 2-5/8" | 1312 / 0 | 793 / 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 | 19-01-06 | Top | | 12 | | | 00-00-00 |
| 1 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 17-09-02 | Top | 27 | 13 | | | n\a |
| 2 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 17-09-02 | 19-01-06 | Top | 14 | 7 | | | n\a |
| 3 | B2E H (i23572) | Conc. Pt. (lbs) | L | 17-07-06 | 17-07-06 | Top | 1156 | 602 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 5052 ft-lbs | 35392 ft-lbs | 14.3% | 1 | 11-11-10 |
| End Shear | 2906 lbs | 14464 lbs | 20.1% | 1 | 17-10-14 |
| Total Load Deflection | L/931 (0.243") | n\a | 25.8% | 4 | 10-02-01 |
| Live Load Deflection | L/1640 (0.138") | n\a | 22.0% | 5 | 10-02-01 |
| Max Defl. | 0.243" | n\a | n\a | 4 | 10-02-01 |
| Span / Depth | 19.0 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 2-3/8" x 3-1/2" | 861 lbs | 16.8% | 8.5% | Spruce-Pine-Fir |
| B2 | Beam | 2-5/8" x 3-1/2" | 2960 lbs | 75.4% | 26.4% | Unspecified |

## Cautions

Concentrated side load(s) 2 are closer than 18" from end of member.Please consult a technical representative or Professional of Record.

## 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

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. YAM8781-2L
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

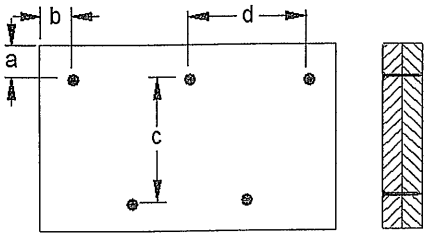
PASSED

## 1ST FLOOR \Flush Beams\B41 E(i23552) (Flush Beam)

BC CALC® Member Report
Build 7493
Dry | 1 span | No cant.
August 26, 2020 10:53:26

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl |
| Address: | | Description: | 1ST FLOOR \Flush Beams\B41 E(i23552) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 24"

Connectors are: [illegible] Nails
3½" ARDOX SPIRAL

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

LICENSED PROFESSIONAL ENGINEER
4154
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 8781 - 2 L
STRUCTURAL
COMPONENT ONLY

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Boise Cascade

# Triple 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

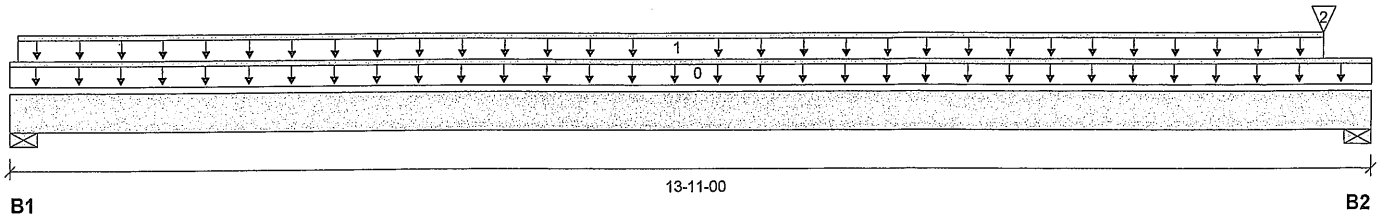
## 2ND FLOOR \Dropped Beams\B14E DR(i23617) (Dropped Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 26, 2020 10:53:26

Build 7493

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

File name: 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl
Description: 2ND FLOOR \Dropped Beams\B14E DR(i23617)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 13-11-00**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 4952 / 0 | 2607 / 0 | | |
| B2, 3-1/2" | 4774 / 0 | 2518 / 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 | 13-11-00 | Top | | 18 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-01-00 | 13-05-00 | Top | 701 | 351 | | | n\a |
| 2 | J6(i23790) | Conc. Pt. (lbs) | L | 13-05-00 | 13-05-00 | Top | 379 | 190 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 34738 ft-lbs | 55212 ft-lbs | 62.9% | 1 | 07-05-00 |
| End Shear | 9535 lbs | 21696 lbs | 44.0% | 1 | 12-07-10 |
| Total Load Deflection | L/295 (0.547") | n\a | 81.2% | 4 | 06-11-00 |
| Live Load Deflection | L/451 (0.358") | n\a | 79.8% | 5 | 06-11-00 |
| Max Defl. | 0.547" | n\a | n\a | 4 | 06-11-00 |
| Span / Depth | 13.6 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 5-1/4" | 10687 lbs | 43.6% | 47.7% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 3-1/2" x 5-1/4" | 10309 lbs | 42.0% | 46.0% | Spruce-Pine-Fir |

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BUILDING DIVISION
08/12/2021
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Per:_____

## 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: 00-10-04, Bottom: 00-10-04.
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

LICENSED PROFESSIONAL ENGINEER
4154
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 8782-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Triple 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLOOR \Dropped Beams\B14E DR(i23617) (Dropped Beam)

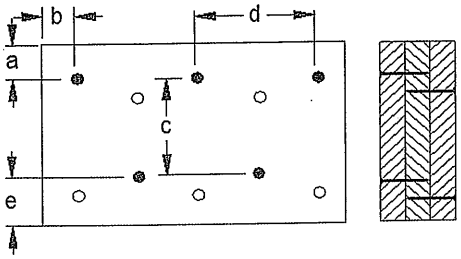
Dry | 1 span | No cant.

August 26, 2020 10:53:26

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl
Description: 2ND FLOOR \Dropped Beams\B14E DR(i23617)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 24"
e minimum = 3"

Nailing applies to both sides of the member
Connectors are: Nails
3½" ARDOX SPIRAL

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
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Per:

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. YAM B182-21
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Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

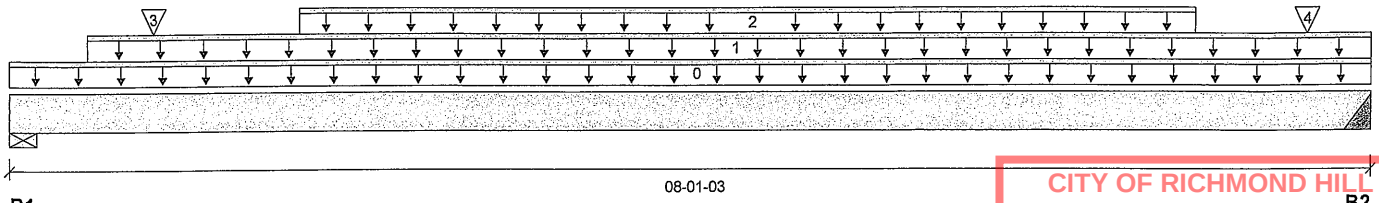
## 2ND FLOOR \Flush Beams\B10E(i23469) (Flush Beam)

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

August 26, 2020 10:53:26

File name: 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl
Description: 2ND FLOOR \Flush Beams\B10E(i23469)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 08-01-03

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
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Per:

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 481 / 0 | 871 / 0 | | |
| B2, 3" | 482 / 0 | 523 / 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 | 08-01-03 | Top | | 6 | | | 00-00-00 |
| 1 | WALL | Unf. Lin. (lb/ft) | L | 00-05-08 | 08-01-03 | Top | | 60 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 01-08-08 | 07-00-08 | Top | 126 | 63 | | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 00-10-04 | 00-10-04 | Top | 167 | 489 | | | n\a |
| 4 | J5(i23415) | Conc. Pt. (lbs) | L | 07-08-08 | 07-08-08 | Top | 117 | 59 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2570 ft-lbs | 17696 ft-lbs | 14.5% | 1 | 03-08-08 |
| End Shear | 1205 lbs | 7232 lbs | 16.7% | 1 | 01-05-06 |
| Total Load Deflection | L/999 (0.039") | n\a | n\a | 4 | 04-00-08 |
| Live Load Deflection | L/999 (0.018") | n\a | n\a | 5 | 04-02-08 |
| Max Defl. | 0.039" | n\a | n\a | 4 | 04-00-08 |
| Span / Depth | 7.6 | | | | |

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PROVINCE OF ONTARIO

DWG NO. TAM 8783-2L
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## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 1-3/4" | 1220 lbs | 31.7% | 16.0% | Spruce-Pine-Fir |
| B2 | Hanger | 3" x 1-3/4" | 1378 lbs | n\a | 21.5% | HUS1.81/10 |

## Cautions

Header for the hanger HUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 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

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Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

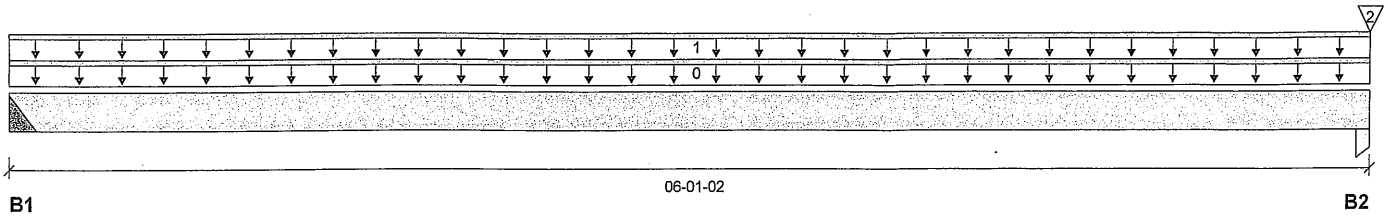
**PASSED**

## 2ND FLOOR \Flush Beams\B11E(i23434) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 26, 2020 10:53:26

Build 7493

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl |
| Address: | | Description: | 2ND FLOOR \Flush Beams\B11E(i23434) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |




**Total Horizontal Product Length = 06-01-02**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3" | 32 / 0 | 34 / 0 | | |
| B2, 3-1/2" | 67 / 0 | 52 / 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 | 06-01-02 | Top | | 6 | | | 00-00-00 |
| 1 | FC2 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 06-01-02 | Top | 10 | 5 | | | n\a |
| 2 | STAIR | Conc. Pt. (lbs) | L | 06-01-02 | 06-01-02 | Top | 35 | 18 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 119 ft-lbs | 17696 ft-lbs | 0.7% | 1 | 03-00-05 |
| End Shear | 53 lbs | 7232 lbs | 0.7% | 1 | 01-02-14 |
| Total Load Deflection | L/999 (0.001") | n\a | n\a | 4 | 03-00-05 |
| Live Load Deflection | L/999 (0") | n\a | n\a | 5 | 03-00-05 |
| Max Defl. | 0.001" | n\a | n\a | 4 | 03-00-05 |
| Span / Depth | 5.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 3" x 1-3/4" | 90 lbs | n\a | 1.4% | HUS1.81/10 |
| B2 | Column | 3-1/2" x 1-3/4" | 165 lbs | 4.2% | 2.2% | Unspecified |

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4184
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DWG NO. YAM 8784-2 L
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## Cautions

Header for the hanger HUS1.81/10 is a Single 1-3/4" x 11-7/8" LVL Beam.

Hanger model HUS1.81/10 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.

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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

CITY OF RICHMOND HILL
BUILDING DIVISION
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## Disclosure

Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

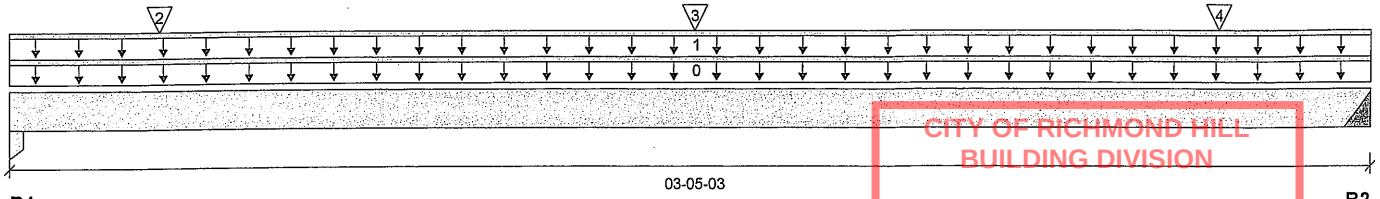
## 2ND FLOOR \Flush Beams\B12E(i23441) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 26, 2020 10:53:26

Build 7493

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

File name: 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl
Description: 2ND FLOOR \Flush Beams\B12E(i23441)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 03-05-03

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
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Per:_____

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 1-3/4" | 593 / 0 | 306 / 0 | | |
| B2, 3" | 630 / 0 | 325 / 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 | 03-05-03 | Top | | 6 | | | 00-00-00 |
| 1 | STAIR | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-05-03 | Top | 240 | 120 | | | n\a |
| 2 | J6(i23391) | Conc. Pt. (lbs) | L | 00-04-08 | 00-04-08 | Top | 116 | 58 | | | n\a |
| 3 | J6(i23433) | Conc. Pt. (lbs) | L | 01-08-08 | 01-08-08 | Top | 166 | 83 | | | n\a |
| 4 | J6(i23458) | Conc. Pt. (lbs) | L | 03-00-08 | 03-00-08 | Top | 117 | 58 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 984 ft-lbs | 17696 ft-lbs | 5.6% | 1 | 01-08-08 |
| End Shear | 496 lbs | 7232 lbs | 6.9% | 1 | 02-02-05 |
| Total Load Deflection | L/999 (0.002") | n\a | n\a | 4 | 01-08-01 |
| Live Load Deflection | L/999 (0.002") | n\a | n\a | 5 | 01-08-01 |
| Max Defl. | 0.002" | n\a | n\a | 4 | 01-08-01 |
| Span / Depth | 3.2 | | | | |

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PROVINCE OF ONTARIO

DWG NO. LAM6765-2 L
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COMPONENT ONLY

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Column | 1-3/4" x 1-3/4" | 1272 lbs | 63.9% | 34.0% | Unspecified |
| B2 | Hanger | 3" x 1-3/4" | 1351 lbs | n\a | 21.1% | HUS1.81/10 |

## Cautions

Header for the hanger HUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 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

## Disclosure

Boise Cascade

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

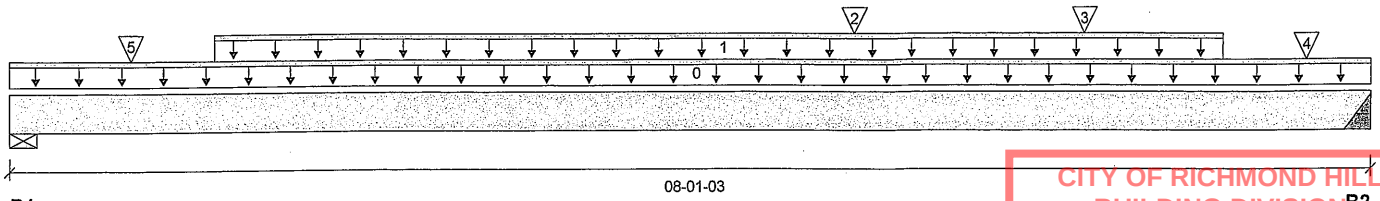
## 2ND FLOOR \Flush Beams\B13E(i23672) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 26, 2020 10:53:26

Build 7493

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

File name: 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl
Description: 2ND FLOOR \Flush Beams\B13E(i23672)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 08-01-03

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
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Per:

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 1495 / 0 | 1164 / 0 | | |
| B2, 3" | 1619 / 0 | 865 / 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 | 08-01-03 | Top | | 6 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 01-02-08 | 07-02-08 | Top | 336 | 168 | | | n\a |
| 2 | - | Conc. Pt. (lbs) | L | 04-11-10 | 04-11-10 | Top | 112 | 89 | | | n\a |
| 3 | J5(i23433) | Conc. Pt. (lbs) | L | 06-04-08 | 06-04-08 | Top | 162 | 81 | | | n\a |
| 4 | - | Conc. Pt. (lbs) | L | 07-08-08 | 07-08-08 | Top | 372 | 186 | | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 00-08-08 | 00-08-08 | Top | 407 | 609 | | | n\a |

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4154
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PROVINCE OF ONTARIO
DWG NO. TAM-8766-21
STRUCTURAL COMPONENT ONLY

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 6025 ft-lbs | 17696 ft-lbs | 34.0% | 1 | 04-08-08 |
| End Shear | 2820 lbs | 7232 lbs | 39.0% | 1 | 06-10-05 |
| Total Load Deflection | L/999 (0.089") | n\a | n\a | 4 | 04-02-09 |
| Live Load Deflection | L/999 (0.057") | n\a | n\a | 5 | 04-02-09 |
| Max Defl. | 0.089" | n\a | n\a | 4 | 04-02-09 |
| Span / Depth | 7.6 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 1-3/4" | 3698 lbs | 62.4% | 31.5% | Spruce-Pine-Fir |
| B2 | Hanger | 3" x 1-3/4" | 3509 lbs | n\a | 54.8% | HUS1.81/10 |

## Cautions

Header for the hanger HUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 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

## 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.

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Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

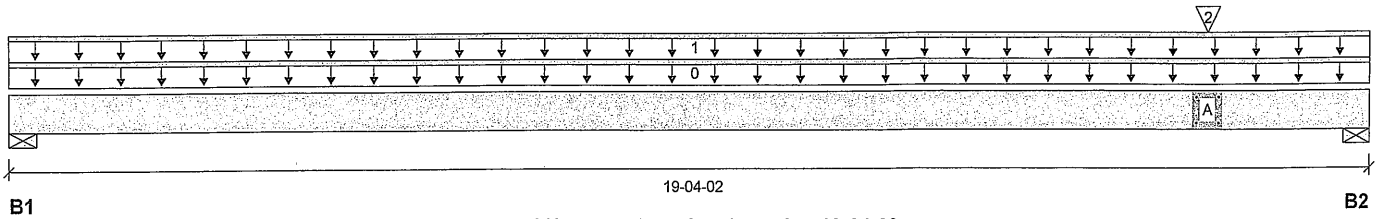
## 2ND FLOOR \Flush Beams\B21E(i23576) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 26, 2020 10:53:26

Build 7493

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

File name: 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl
Description: 2ND FLOOR \Flush Beams\B21E(i23576)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 19-04-02

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4-3/8" | 421 / 0 | 332 / 0 | | |
| B2, 5-1/2" | 1676 / 0 | 1007 / 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 | 19-04-02 | Top | | 12 | | | 00-00-00 |
| 1 | FC2 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 19-04-02 | Top | 27 | 13 | | | n\a |
| 2 | B13E(i23672) | Conc. Pt. (lbs) | L | 17-00-02 | 17-00-02 | Top | 1581 | 849 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 7326 ft-lbs | 35392 ft-lbs | 20.7% | 1 | 14-06-12 |
| End Shear | 3703 lbs | 14464 lbs | 25.6% | 1 | 17-10-12 |
| Total Load Deflection | L/687 (0.325") | n\a | 34.9% | 4 | 10-04-14 |
| Live Load Deflection | L/1166 (0.192") | n\a | 30.9% | 5 | 10-04-14 |
| Max Defl. | 0.325" | n\a | n\a | 4 | 10-04-14 |
| Span / Depth | 18.8 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 4-3/8" x 3-1/2" | 1047 lbs | 11.1% | 5.6% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 3773 lbs | 31.9% | 16.1% | 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

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S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. YAM 8787-21
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Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

## 2ND FLOOR \Flush Beams\B21E(i23576) (Flush Beam)

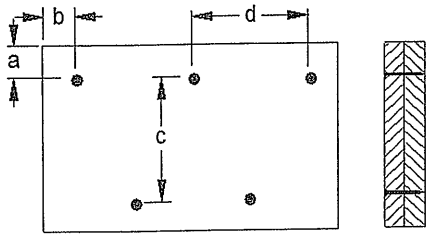
Dry | 1 span | No cant.

August 26, 2020 10:53:26

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl
Description: 2ND FLOOR \Flush Beams\B21E(i23576)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member

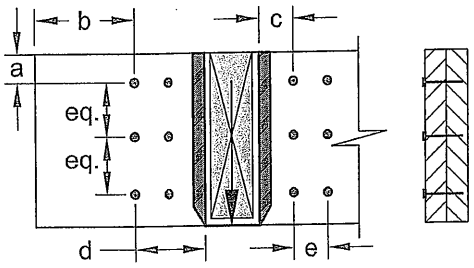



a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 24"

Connectors are: Nails
3½" ARDOX SPIRAL

## Connection Diagrams: Concentrated Side Loads

Connection Tag: ~~A~~ Applies to load tag(s): 3




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

LICENSED PROFESSIONAL ENGINEER
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PROVINCE OF ONTARIO

DWG NO. YAM 8787-2 L
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BUILDING DIVISION
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## Disclosure

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Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

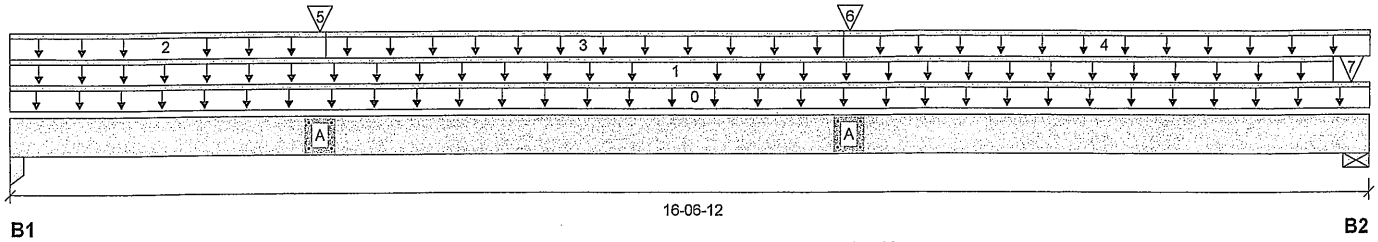
PASSED

## 2ND FLOOR \Flush Beams\B9E(i23405) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 26, 2020 10:53:26

Build 7493

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl |
| Address: | | Description: | 2ND FLOOR \Flush Beams\B9E(i23405) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |




Total Horizontal Product Length = 16-06-12

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 854 / 0 | 1143 / 0 | | |
| B2, 5-1/2" | 623 / 0 | 1085 / 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 | 16-06-12 | Top | | 12 | | | 00-00-00 |
| 1 | WALL | Unf. Lin. (lb/ft) | L | 00-00-00 | 16-01-04 | Top | | 60 | | | n\a |
| 2 | FC2 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-10-00 | Top | 27 | 13 | | | n\a |
| 3 | FC2 Floor Material | Unf. Lin. (lb/ft) | L | 03-10-00 | 10-00-07 | Top | 19 | 9 | | | n\a |
| 4 | FC2 Floor Material | Unf. Lin. (lb/ft) | L | 10-00-07 | 16-06-12 | Top | 27 | 13 | | | n\a |
| 5 | B12E(i23441) | Conc. Pt. (lbs) | L | 03-09-02 | 03-09-02 | Top | 610 | 315 | | | n\a |
| 6 | B10E(i23469) | Conc. Pt. (lbs) | L | 10-01-05 | 10-01-05 | Top | 474 | 527 | | | n\a |
| 7 | E59(i3207) | Conc. Pt. (lbs) | L | 16-04-00 | 16-04-00 | Top | | 24 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 10860 ft-lbs | 35392 ft-lbs | 30.7% | 1 | 10-01-05 |
| End Shear | 2498 lbs | 14464 lbs | 17.3% | 1 | 01-05-06 |
| Total Load Deflection | L/519 (0.365") | n\a | 46.2% | 4 | 08-03-08 |
| Live Load Deflection | L/1277 (0.148") | n\a | 28.2% | 5 | 08-01-03 |
| Max Defl. | 0.365" | n\a | n\a | 4 | 08-03-08 |
| Span / Depth | 15.9 | | | | |

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BUILDING DIVISION
08/12/2021
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Per:_____

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Column | 5-1/2" x 3-1/2" | 2710 lbs | 21.7% | 11.5% | Unspecified |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 1519 lbs | 19.7% | 10.0% | 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

CONFORMS TO OBC 2012
AMENDED 2020

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. YAM 8788.21
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

## 2ND FLOOR \Flush Beams\B9E(i23405) (Flush Beam)

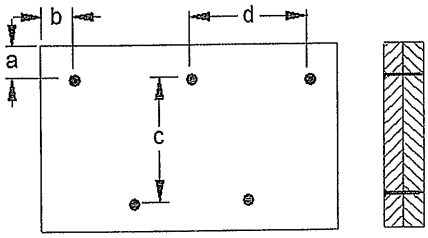
Dry | 1 span | No cant.

August 26, 2020 10:53:26

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - EL A,B,C OPTION GROUND FLOOR.mmdl
Description: 2ND FLOOR \Flush Beams\B9E(i23405)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member



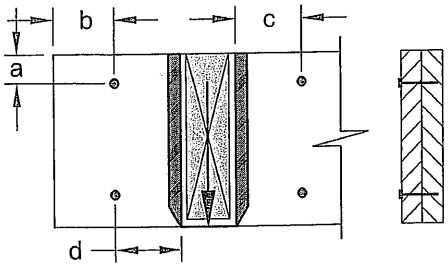

a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 24"

Connectors are: 3½" ARDOX SPIRAL Nails



## Connection Diagrams: Concentrated Side Loads

Connection Tag: A Applies to load tag(s): 3,7




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

3½" ARDOX SPIRAL



## Disclosure

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Boise Cascade

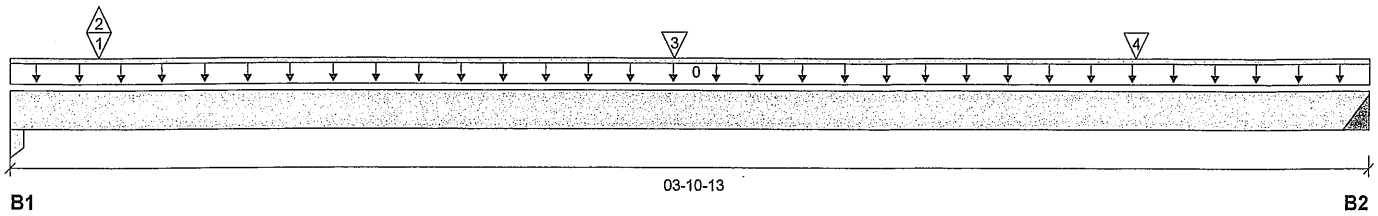
# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 1ST FLOOR \Flush Beams\B18E H(i20862) (Flush Beam)

BC CALC® Member Report
Build 7493
Dry | 1 span | No cant.
August 26, 2020 09:07:47

| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C IN-LAW SUITE.mmdl |
| Address: | | Description: | 1ST FLOOR \Flush Beams\B18E H(i20862) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |




Total Horizontal Product Length = 03-10-13

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 1-3/4" | 1220 / 5 | 832 / 0 | | |
| B2, 4" | 504 / 0 | 282 / 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 | 03-10-13 | Top | | 12 | | | 00-00-00 |
| 1 | - | Conc. Pt. (lbs) | L | 00-03-00 | 00-03-00 | Top | 1058 | 734 | | | n\a |
| 2 | - | Conc. Pt. (lbs) | L | 00-03-00 | 00-03-00 | Top | -5 | | | | n\a |
| 3 | J3(i21356) | Conc. Pt. (lbs) | L | 01-10-10 | 01-10-10 | Top | 368 | 184 | | | n\a |
| 4 | J3(i21221) | Conc. Pt. (lbs) | L | 03-02-10 | 03-02-10 | Top | 298 | 149 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1057 ft-lbs | 35392 ft-lbs | 3.0% | 1 | 01-10-10 |
| End Shear | 677 lbs | 14464 lbs | 4.7% | 1 | 02-06-15 |
| Total Load Deflection | L/999 (0.002") | n\a | n\a | 6 | 01-10-01 |
| Live Load Deflection | L/999 (0.001") | n\a | n\a | 8 | 01-10-01 |
| Max Defl. | 0.002" | n\a | n\a | 6 | 01-10-01 |
| Span / Depth | 3.6 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Column | 1-3/4" x 3-1/2" | 2870 lbs | 57.7% | 38.4% | Unspecified |
| B2 | Hanger | 4" x 3-1/2" | 1108 lbs | n\a | 6.5% | HGUS410 |

## Cautions

Header for the hanger HGUS410 is a Double 1-3/4" x 11-7/8" LVL Beam.

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

Concentrated side load(s) 1 are closer than 18" from end of member.Please consult a technical representative or Professional of Record.

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 8709-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

## 1ST FLOOR \Flush Beams\B18E H(i20862) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 26, 2020 09:07:47

Build 7493

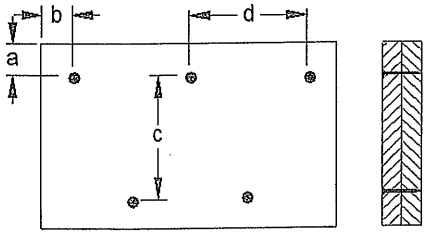
| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL A,B,C IN-LAW SUITE.mmdl |
| Address: | | Description: | 1ST FLOOR \Flush Beams\B18E H(i20862) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |

## 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.
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" c = 7-7/8"
b minimum = 3" d = 24"

Calculated Side Load = 391.0 lb/ft
Connectors are: 16d Nails
3½" ARDOX SPIRAL


DWG NO. YAM 8789-21
STRUCTURAL
COMPONENT ONLY

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

## 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® ,

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

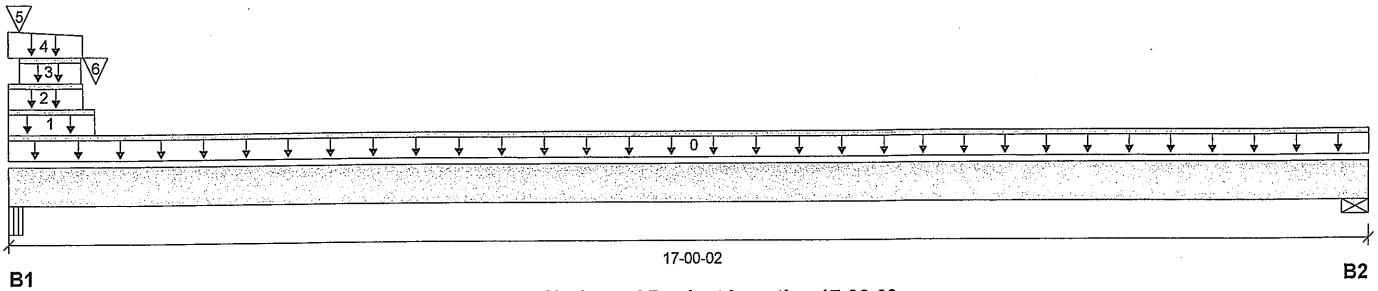
PASSED

## 2ND FLOOR \Flush Beams\B7B(i17747) (Flush Beam)

BC CALC® Member Report
Build 7493
Dry | 1 span | No cant.
August 26, 2020 10:01:33

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

File name: 4504 - EL B 2ND FLR 4 BEDROOM.mmdl
Description: 2ND FLOOR \Flush Beams\B7B(i17747)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 17-00-02

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-7/8" | 768 / 0 | 1250 / 0 | 1014 / 0 | |
| B2, 2-3/4" | 35 / 0 | 155 / 0 | 47 / 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 | 17-00-02 | Top | | 12 | | | 00-00-00 |
| 1 | ROOF | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-00-10 | Top | 33 | 30 | 78 | | n\a |
| 2 | E43(i937) | Unf. Lin. (lb/ft) | L | 00-00-00 | 00-10-14 | Top | | 81 | | | n\a |
| 3 | E43(i937) | Unf. Lin. (lb/ft) | L | 00-01-10 | 00-10-10 | Top | 33 | 30 | 78 | | n\a |
| 4 | FC3 Floor Material | Trapezoidal (lb/ft) | L | 00-00-00 | | Top | 27 | | | | n\a |
| | | | | | 00-10-14 | | 23 | | | | |
| 5 | E43(i937) | Conc. Pt. (lbs) | L | 00-01-10 | 00-01-10 | Top | | 13 | 30 | | n\a |
| 6 | - | Conc. Pt. (lbs) | L | 01-00-13 | 01-00-13 | Top | 722 | 1049 | 887 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2812 ft-lbs | 35392 ft-lbs | 7.9% | 13 | 01-01-10 |
| End Shear | 2812 lbs | 14464 lbs | 19.4% | 13 | 01-03-12 |
| Total Load Deflection | L/999 (0.09") | n\a | n\a | 35 | 07-07-12 |
| Live Load Deflection | L/999 (0.043") | n\a | n\a | 51 | 07-02-05 |
| Max Defl. | 0.09" | n\a | n\a | 35 | 07-07-12 |
| Span / Depth | 16.8 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 3-7/8" x 3-1/2" | 3852 lbs | 53.2% | 23.3% | Unspecified |
| B2 | Wall/Plate | 2-3/4" x 3-1/2" | 217 lbs | 5.6% | 2.8% | Spruce-Pine-Fir |

## Cautions

Concentrated side load(s) 24 are closer than 18" from end of member.Please consult a technical representative or Professional of Record.

LICENSED PROFESSIONAL ENGINEER
4152
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM8792-21
STRUCTURAL
COMPONENT ONLY

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

## 2ND FLOOR \Flush Beams\B7B(i17747) (Flush Beam)

Dry | 1 span | No cant.

August 26, 2020 10:01:33

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

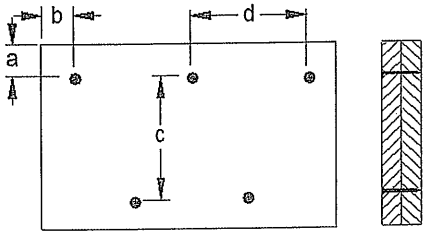
File name: 4504 - EL B 2ND FLR 4 BEDROOM.mmdl
Description: 2ND FLOOR \Flush Beams\B7B(i17747)
Specifier:
Designer: L.D.
Company:

## 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: 00-00-00, Bottom: 00-00-00.
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 = 7-7/8"
d = 24"

Calculated Side Load = 355.5 lb/ft
Connectors are: 16d . . . Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. YAM B792-2L
STRUCTURAL
COMPONENT ONLY

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

## 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® ,

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

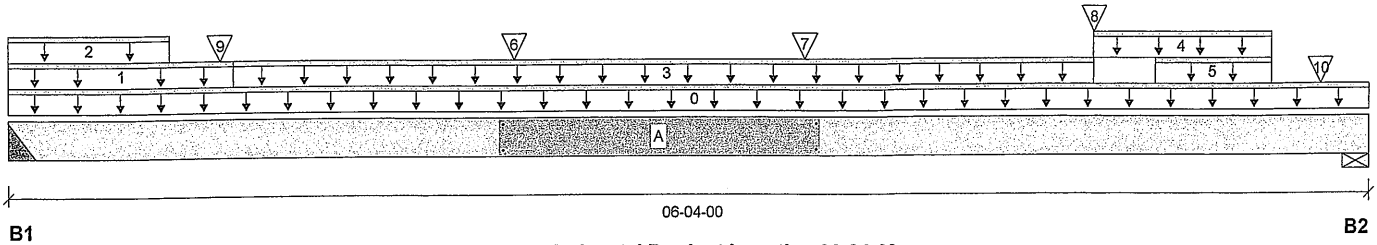
## 2ND FLOOR \Flush Beams\B8B(i17721) (Flush Beam)

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

August 26, 2020 10:01:33

File name: 4504 - EL B 2ND FLR 4 BEDROOM.mmdl
Description: 2ND FLOOR \Flush Beams\B8B(i17721)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 06-04-00

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 728 / 0 | 828 / 0 | 495 / 0 | |
| B2, 5-1/2" | 793 / 0 | 866 / 0 | 515 / 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 | 06-04-00 | Top | | 12 | | | 00-00-00 |
| 1 | E75(i3228) | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-00-08 | Top | | 81 | | | n\a |
| 2 | E75(i3228) | Unf. Lin. (lb/ft) | L | 00-00-00 | 00-09-00 | Top | | 46 | 110 | | n\a |
| 3 | E76(i3229) | Unf. Lin. (lb/ft) | L | 01-00-08 | 05-00-08 | Top | | 41 | | | n\a |
| 4 | E42(i931) | Unf. Lin. (lb/ft) | L | 05-00-08 | 05-10-08 | Top | | 81 | | | n\a |
| 5 | E42(i931) | Unf. Lin. (lb/ft) | L | 05-04-00 | 05-10-08 | Top | | 46 | 110 | | n\a |
| 6 | J2(i17898) | Conc. Pt. (lbs) | L | 02-04-00 | 02-04-00 | Top | 433 | 265 | 92 | | n\a |
| 7 | J2(i17897) | Conc. Pt. (lbs) | L | 03-08-00 | 03-08-00 | Top | 433 | 265 | 92 | | n\a |
| 8 | - | Conc. Pt. (lbs) | L | 05-00-08 | 05-00-08 | Top | 401 | 383 | 333 | | n\a |
| 9 | - | Conc. Pt. (lbs) | L | 00-11-12 | 00-11-12 | Top | 244 | 272 | 300 | | n\a |
| 10 | E59(i3207) | Conc. Pt. (lbs) | L | 06-01-04 | 06-01-04 | Top | | 43 | 48 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 3701 ft-lbs | 35392 ft-lbs | 10.5% | 1 | 03-08-00 |
| End Shear | 2432 lbs | 14464 lbs | 16.8% | 1 | 04-10-10 |
| Total Load Deflection | L/999 (0.017") | n\a | n\a | 35 | 03-01-00 |
| Live Load Deflection | L/999 (0.01") | n\a | n\a | 51 | 03-02-00 |
| Max Defl. | 0.017" | n\a | n\a | 35 | 03-01-00 |
| Span / Depth | 5.7 | | | | |

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 2622 lbs | n\a | 15.3% | HGUS410 |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 2788 lbs | 23.5% | 11.9% | Spruce-Pine-Fir |

## Cautions

Header for the hanger HGUS410 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO
DWG NO. FAM8793-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLOOR \Flush Beams\B8B(i17721) (Flush Beam)

Dry | 1 span | No cant.

August 26, 2020 10:01:33

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

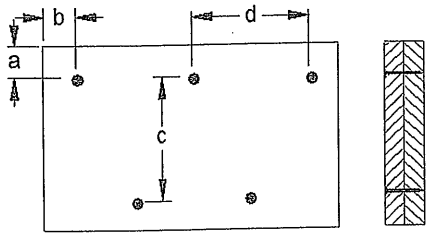
File name: 4504 - EL B 2ND FLR 4 BEDROOM.mmdl
Description: 2ND FLOOR \Flush Beams\B8B(i17721)
Specifier:
Designer: L.D.
Company:

## 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 = 7-7/8"
d = 12"

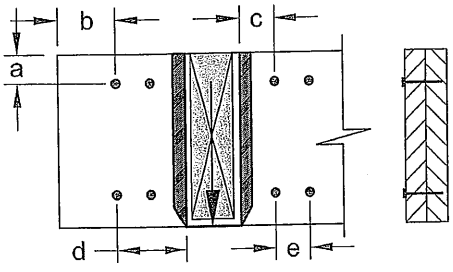
Calculated Side Load = 494.8 lb/ft
Connectors are: , Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
S. KATSOUDAKOS
PROVINCE OF ONTARIO

DWG NO. YAM 0793-2L
STRUCTURAL
COMPONENT ONLY

## Connection Diagrams: Concentrated Side Loads

Connection Tag: A ~~Applies to load~~ tag(s): 23+24+25+26+27+28+29+30+31+32




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

3½" ARDOX SPIRAL

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

## Disclosure

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Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

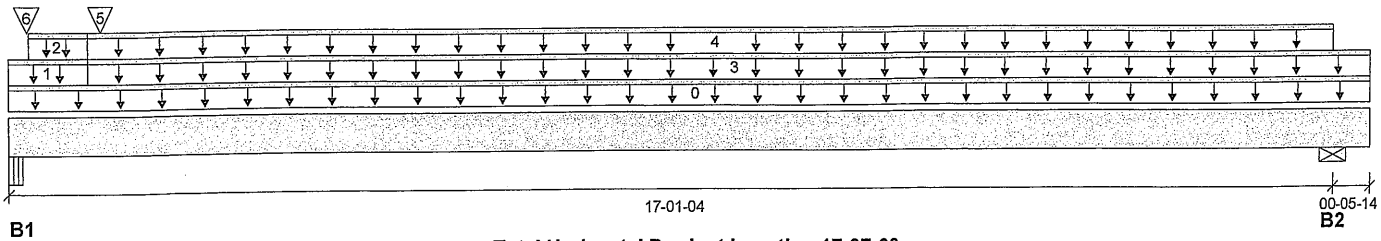
## 2ND FLOOR \Flush Beams\B7C(i21289) (Flush Beam)

Dry | 2 spans | R cant.

August 26, 2020 13:12:24

BC CALC® Member Report
Build 7493
Job name:
Address:
City, Province, Postal Code: RICHMOND HILL
Customer:
Code reports: CCMC 12472-R

File name: 4504 - EL C 2ND FLR 5 BEDROOM.mmdl
Description: 2ND FLOOR \Flush Beams\B7C(i21289)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 17-07-02

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5" | 1109 / 0 | 1342 / 0 | 795 / 0 | |
| B2, 5-1/2" | 233 / 0 | 254 / 0 | 38 / 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 | 17-07-02 | Top | | 12 | | | 00-00-00 |
| 1 | E43(i937) | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-00-00 | Top | | 81 | | | n\a |
| 2 | E43(i937) | Unf. Lin. (lb/ft) | L | 00-03-00 | 01-00-00 | Top | 33 | 30 | 78 | | n\a |
| 3 | FC2 Floor Material | Unf. Lin. (lb/ft) | L | 01-00-00 | 17-07-02 | Top | 5 | 3 | | | n\a |
| 4 | FC2 Floor Material | Unf. Lin. (lb/ft) | L | 01-00-00 | 17-01-04 | Top | 16 | 8 | | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 01-02-00 | 01-02-00 | Top | 954 | 1088 | 747 | | n\a |
| 6 | E43(i937) | Conc. Pt. (lbs) | L | 00-02-12 | 00-02-12 | Top | | | 28 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 3841 ft-lbs | 35392 ft-lbs | 10.9% | 2 | 05-11-03 |
| Neg. Moment | -5 ft-lbs | -35392 ft-lbs | n\a | 1 | 17-01-04 |
| End Shear | 3124 lbs | 14464 lbs | 21.6% | 1 | 01-04-14 |
| Cont. Shear | 611 lbs | 14464 lbs | 4.2% | 1 | 15-10-10 |
| Total Load Deflection | L/1316 (0.153") | n\a | 18.2% | 82 | 08-02-05 |
| Live Load Deflection | L/999 (0.083") | n\a | n\a | 120 | 07-11-10 |
| Total Neg. Defl. | 2xL/1998 (-0.013") | n\a | n\a | 82 | 17-07-02 |
| Max Defl. | 0.153" | n\a | n\a | 82 | 08-02-05 |
| Span / Depth | 16.9 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 5" x 3-1/2" | 4137 lbs | 55.3% | 19.4% | Unspecified |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 706 lbs | 6.0% | 3.0% | Spruce-Pine-Fir |

## Cautions

Concentrated side load(s) 15 are closer than 18" from end of member.Please consult a technical representative or Professional of Record.

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

LICENSED PROFESSIONAL ENGINEER
S. KATSOUDAKOS
PROVINCE OF ONTARIO

DWG NO. YAM B79-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

## 2ND FLOOR \Flush Beams\B7C(i21289) (Flush Beam)

BC CALC® Member Report — Dry | 2 spans | R cant. — August 26, 2020 13:12:24

Build 7493

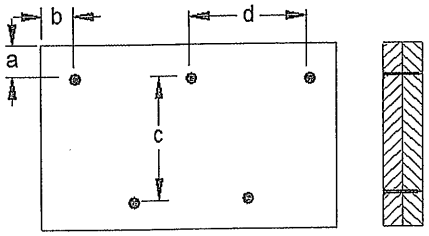
| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL C 2ND FLR 5 BEDROOM.mmdl |
| Address: | | Description: | 2ND FLOOR \Flush Beams\B7C(i21289) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |

## 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
Cantilevers require sheathed bottom flanges, blocking at cantilever support and closure at ends.

CONFORMS TO OBC 2012
AMENDED 2020

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 24"

Calculated Side Load = 250.5 lb/ft
Connectors are: [illegible] Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
4154
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. YAM B794-21
STRUCTURAL
COMPONENT ONLY

CITY OF RICHMOND HILL
BUILDING DIVISION
08/12/2021
RECEIVED
Per:_____

## Disclosure

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

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

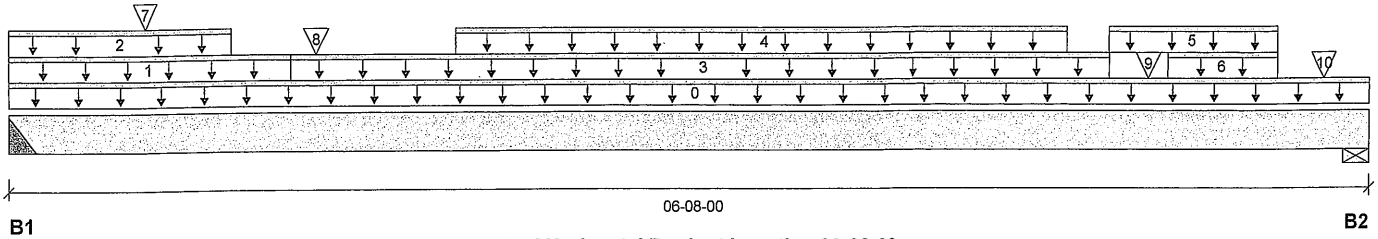
## 2ND FLOOR \Flush Beams\B8C(i21294) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 26, 2020 13:12:24

Build 7493

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

File name: 4504 - EL C 2ND FLR 5 BEDROOM.mmdl
Description: 2ND FLOOR \Flush Beams\B8C(i21294)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 06-08-00**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 978 / 0 | 898 / 0 | 361 / 0 | |
| B2, 5-1/2" | 910 / 0 | 854 / 0 | 347 / 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 | 06-08-00 | Top | | 12 | | | 00-00-00 |
| 1 | E75(i3228) | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-04-08 | Top | | 81 | | | n\a |
| 2 | E75(i3228) | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-01-00 | Top | | 46 | 110 | | n\a |
| 3 | E76(i3229) | Unf. Lin. (lb/ft) | L | 01-04-08 | 05-04-08 | Top | | 41 | | | n\a |
| 4 | Smoothed Load | Unf. Lin. (lb/ft) | L | 02-02-00 | 05-02-00 | Top | 325 | 162 | | | n\a |
| 5 | E42(i931) | Unf. Lin. (lb/ft) | L | 05-04-08 | 06-02-08 | Top | | 81 | | | n\a |
| 6 | E42(i931) | Unf. Lin. (lb/ft) | L | 05-08-00 | 06-02-08 | Top | | 46 | 110 | | n\a |
| 7 | J2(i21370) | Conc. Pt. (lbs) | L | 00-08-00 | 00-08-00 | Top | 295 | 147 | | | n\a |
| 8 | - | Conc. Pt. (lbs) | L | 01-06-00 | 01-06-00 | Top | 325 | 302 | 254 | | n\a |
| 9 | - | Conc. Pt. (lbs) | L | 05-06-13 | 05-06-13 | Top | 293 | 285 | 250 | | n\a |
| 10 | E59(i3207) | Conc. Pt. (lbs) | L | 06-05-04 | 06-05-04 | Top | | 34 | 25 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 3841 ft-lbs | 35392 ft-lbs | 10.9% | 1 | 03-08-00 |
| End Shear | 2311 lbs | 14464 lbs | 16.0% | 1 | 01-03-14 |
| Total Load Deflection | L/999 (0.019") | n\a | n\a | 35 | 03-03-08 |
| Live Load Deflection | L/999 (0.012") | n\a | n\a | 51 | 03-03-08 |
| Max Defl. | 0.019" | n\a | n\a | 35 | 03-03-08 |
| Span / Depth | 6.1 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 2950 lbs | n\a | 17.3% | HGUS410 |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 2779 lbs | 23.5% | 11.8% | Spruce-Pine-Fir |

## Cautions

Header for the hanger HGUS410 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

CITY OF RICHMOND HILL
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08/12/2021
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Per:

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO, TAM B795-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

PASSED

## 2ND FLOOR \Flush Beams\B8C(i21294) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — August 26, 2020 13:12:24

Build 7493

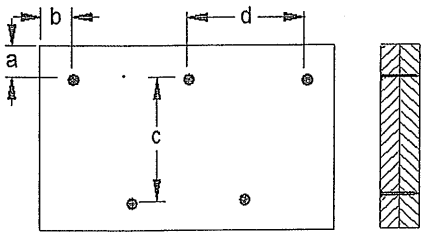
| | | | |
|---|---|---|---|
| Job name: | | File name: | 4504 - EL C 2ND FLR 5 BEDROOM.mmdl |
| Address: | | Description: | 2ND FLOOR \Flush Beams\B8C(i21294) |
| City, Province, Postal Code: | RICHMOND HILL | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |

## 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

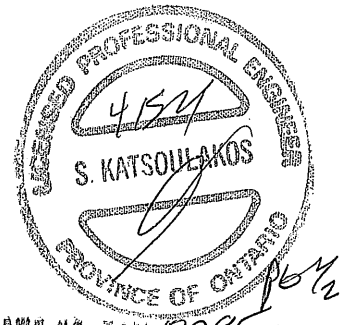
CONFORMS TO OBC 2012
AMENDED 2020

## Connection Diagram: Full Length of Member




a minimum = 2" c = 7-7/8"
b minimum = 3" d = 12"

Calculated Side Load = 690.0 lb/ft
Connectors are: 16d [illegible] Nails
3½" ARDOX SPIRAL




DWG NO. TAM B795 21
STRUCTURAL
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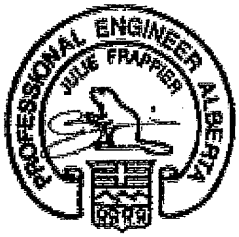
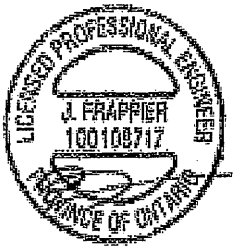
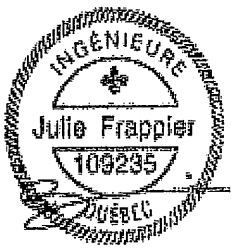
BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

NORDIC ENGINEERED WOOD




## Maximum Floor Spans

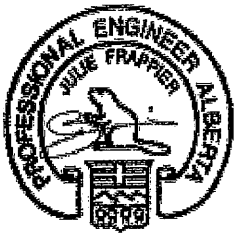
Live Load = 40 psf, Dead Load = 15 psf
Simple Spans, L/480 Deflection Limit
5/8" OSB G&N Sheathing

| Depth | Series | Bare, On Centre Spacing 12" | Bare, On Centre Spacing 16" | Bare, On Centre Spacing 19.2" | Bare, On Centre Spacing 24" | 1/2" Gypsum Ceiling, On Centre Spacing 12" | 1/2" Gypsum Ceiling, On Centre Spacing 16" | 1/2" Gypsum Ceiling, On Centre Spacing 19.2" | 1/2" Gypsum Ceiling, On Centre Spacing 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 |
| | NI-90x | 20'-4" | 18'-9" | 17'-11" | N/A | 20'-10" | 19'-3" | 18'-5" | N/A |
| 14" | 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 |
| | NI-90x | 22'-7" | 20'-11" | 19'-11" | N/A | 23'-3" | 21'-6" | 20'-6" | N/A |
| 16" | 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 |

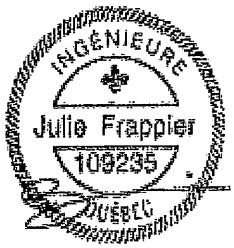
| Depth | Series | Mid-Span Blocking, On Centre Spacing 12" | Mid-Span Blocking, On Centre Spacing 16" | Mid-Span Blocking, On Centre Spacing 19.2" | Mid-Span Blocking, On Centre Spacing 24" | Mid-Span Blocking and 1/2" Gypsum Ceiling, On Centre Spacing 12" | Mid-Span Blocking and 1/2" Gypsum Ceiling, On Centre Spacing 16" | Mid-Span Blocking and 1/2" Gypsum Ceiling, On Centre Spacing 19.2" | Mid-Span Blocking and 1/2" Gypsum Ceiling, On Centre Spacing 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 |
| | NI-90x | 23'-4" | 21'-8" | 20'-8" | N/A | 23'-10" | 22'-2" | 21'-2" | N/A |
| 14" | 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 |
| | NI-90x | 26'-4" | 24'-4" | 23'-3" | N/A | 26'-10" | 24'-11" | 23'-9" | N/A |
| 16" | 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 |

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 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.

NORDIC ENGINEERED WOOD








## Maximum Floor Spans

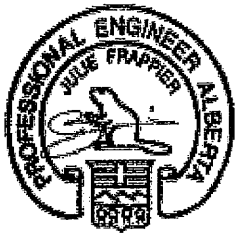
Live Load = 40 psf, Dead Load = 15 psf
Simple Spans, L/480 Deflection Limit
3/4" OSB G&N Sheathing

| 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" |

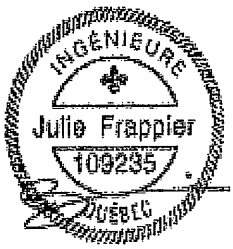
| Depth | Series | Mid-Span Blocking | | | | Mid-Span Blocking and 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 16'-10" | 15'-5" | 14'-6" | 13'-5" | 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.

NORDIC ENGINEERED WOOD








## Maximum Floor Spans

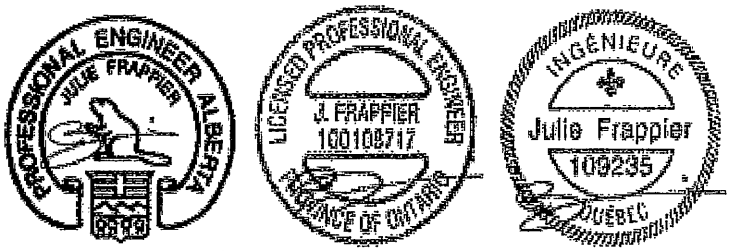
Live Load = 40 psf, Dead Load = 30 psf
Simple Spans, L/480 Deflection Limit
5/8" OSB G&N Sheathing

| 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 |
| | NI-90x | 20'-4" | 18'-9" | 17'-11" | N/A | 20'-10" | 19'-3" | 18'-5" | N/A |
| 14" | 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 |
| | NI-90x | 22'-7" | 20'-11" | 19'-11" | N/A | 23'-3" | 21'-6" | 20'-6" | N/A |
| 16" | 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 |
| | NI-90x | 23'-4" | 21'-8" | 20'-8" | N/A | 23'-10" | 22'-2" | 21'-2" | N/A |
| 14" | 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 |
| | NI-90x | 26'-4" | 24'-4" | 23'-3" | N/A | 26'-10" | 24'-11" | 23'-9" | N/A |
| 16" | 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.

NORDIC ENGINEERED WOOD




## Maximum Floor Spans

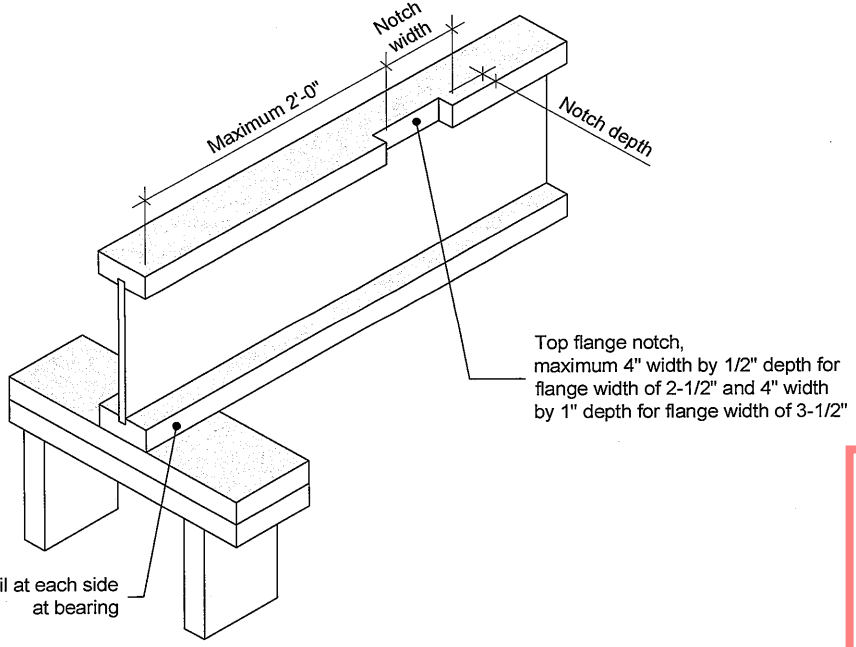
Live Load = 40 psf, Dead Load = 30 psf
Simple Spans, L/480 Deflection Limit
3/4" OSB G&N Sheathing

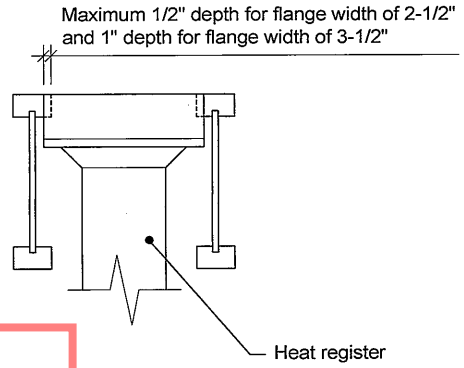
| Depth | Series | Bare | | | | 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-7" | 14'-2" | 13'-4" | 12'-4" | 15'-7" | 14'-2" | 13'-4" | 12'-4" |
| | 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" |
| | 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'-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" |
| | 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 | 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" |
| | NI-90x | 24'-3" | 22'-6" | 21'-3" | 19'-7" | 24'-8" | 22'-7" | 21'-3" | 19'-7" |
| 14" | 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" |
| | NI-90x | 27'-3" | 25'-4" | 24'-1" | 22'-4" | 27'-9" | 25'-10" | 24'-3" | 22'-4" |
| 16" | 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" |

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 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.

1w-1






**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 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.

NORDIC STRUCTURES

T 514-871-8526
1 866 817-3418
nordic.ca

TITLE
Notch in I-joist for Heat Register

DOCUMENT
-

CATEGORY
I-joist - Typical Floor Framing and Construction Details

DATE
2018-04-10

NUMBER
1w-1

**Construction Detail**
Limit States Design

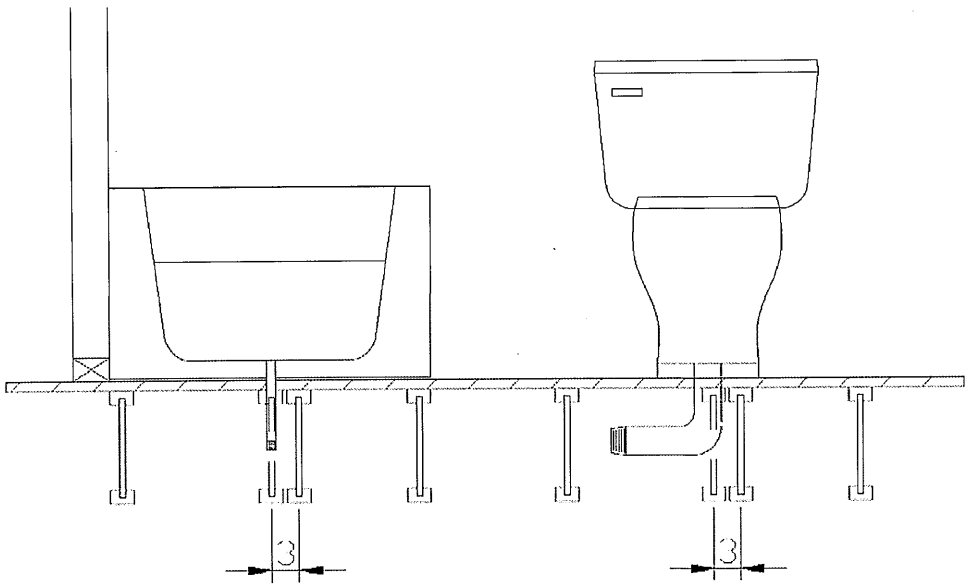
# Allowance for Piping (Installation Notes)

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.

**ALLOWANCE FOR PIPING**




Every third joist may be shifted up to 3 inches to avoid heating/plumbing interference.

Revised April 12, 2012