

INSTALLATION GUIDE

Beam, Header & UC3B Deck Applications



LAMINATED VENEER LUMBER — ALL GRADES | UNTREATED & UC3B PRESERVATIVE TREATED

EXTERIOR ABOVE-GROUND APPLICATIONS (AWPA UC3B)

PRODUCT: EVOLUTION ® LVL (ALL GRADES) | **SERVICE:** INTERIOR DRY (UNTREATED) / EXTERIOR ABOVE-GROUND (UC3B)

1. APPLICABLE PRODUCTS & SERVICE CONDITIONS

UNTREATED LVL	UC3B PRESERVATIVE TREATED LVL
SERVICE CONDITIONS • INTERIOR DRY SERVICE CONDITIONS ONLY ($MC \leq 16\%$) • NO EXPOSURE TO MOISTURE OR WEATHER • FULLY ENCLOSED, CONDITIONED SPACES REQUIRED	SERVICE CONDITIONS • EXTERIOR ABOVE-GROUND APPLICATIONS ONLY • REQUIRES POSITIVE DRAINAGE & VENTILATION • AWPA UC3B COMPLIANT
STATUS • EVOLUTION ® LVL (ALL GRADES) — UNTREATED	STATUS • EVOLUTION ® LVL (ALL GRADES) — UC3B PRESERVATIVE TREATED

2. STORAGE, HANDLING AND INSTALLATION

WARNING: IMPROPER STORAGE, HANDLING OR INSTALLATION MAY RESULT IN POOR IN-SERVICE PERFORMANCE AND UNSAFE CONSTRUCTION FOR EVOLUTION ® LVL.

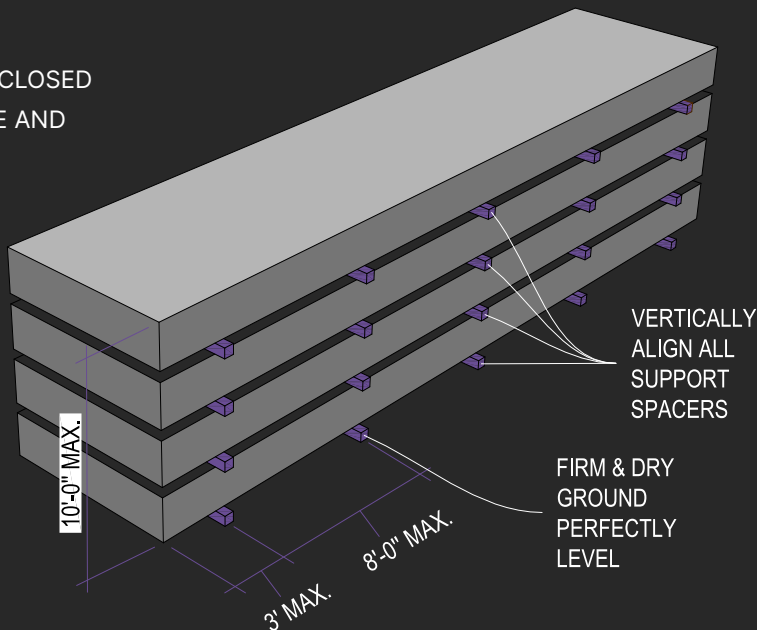
1. STORAGE REQUIREMENTS

- 1.1 STORE EVOLUTION ® LVL FLAT AND FULLY COVERED AGAINST RAIN AND HARSH WEATHER.
- 1.2 STACKING STICKERS VERTICALLY ALIGNED, MAX 8'-0" ON-CENTER SPACING.
- 1.3 MAXIMUM STACKING HEIGHT FOR BUNDLED LVL: 10'-0".
- 1.4 PLACE BOTTOM STICKERS ON SOLID, LEVEL DRY GROUND TO RAISE LUMBER OFF FLOOR, REDUCE GROUND MOISTURE UPTAKE AND ALLOW AIR CIRCULATION.
- 1.5 ALL FORKLIFT DAMAGE MUST BE REPORTED BEFORE ACCEPTING INCOMING MATERIAL.

2. ON-SITE HANDLING & INSTALLATION

- 2.1 UNTREATED EVOLUTION ® LVL IS DESIGNED FOR DRY ENCLOSED INDOOR USE ONLY; SHIELD ALL LVL FROM WEATHER BEFORE AND AFTER INSTALLATION ON SITE.
- 2.2 ONLY LENGTH TRIMMING IS ALLOWED; FIELD DRILLING, NOTCHING OR RANDOM CUTTING IS FORBIDDEN, EXCEPT AS PERMITTED IN SECTION 10.
- 2.3 BASE ALL STACKS ON FIRM, LEVEL, AND DRY SUBSTRATE.
- 2.4 DISCARD ALL VISIBLY DAMAGED LVL PRIOR TO INSTALLATION.

CAUTION: BUNDLE PLASTIC WRAP IS SLIPPERY WHEN WET.



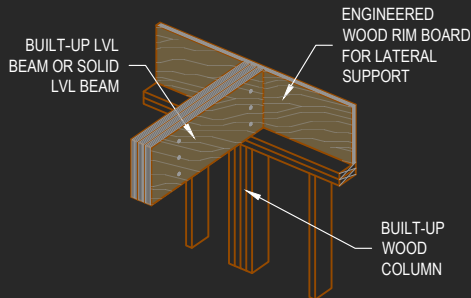
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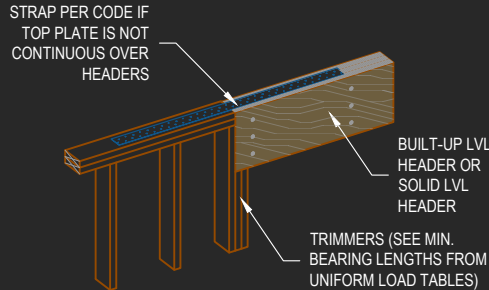


3. BEARING DETAILS

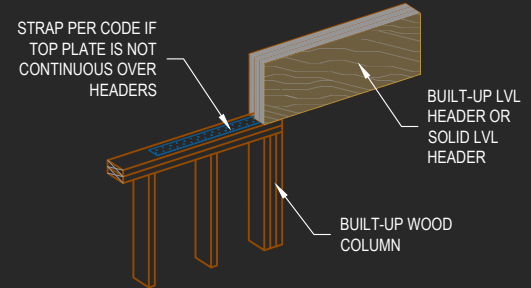
1 BEARING AT WALL



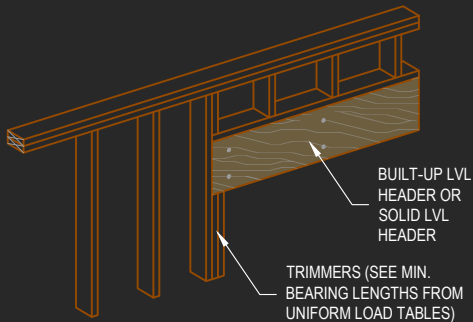
2 BEARING AT OPENING HEADER COND-1



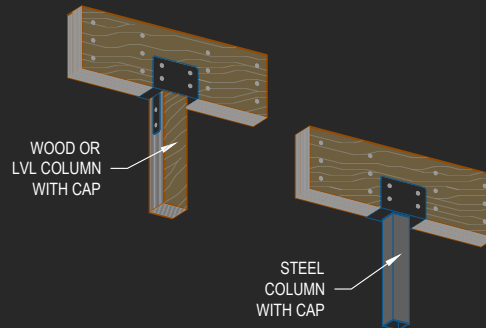
3 BEARING AT OPENING HEADER COND-2



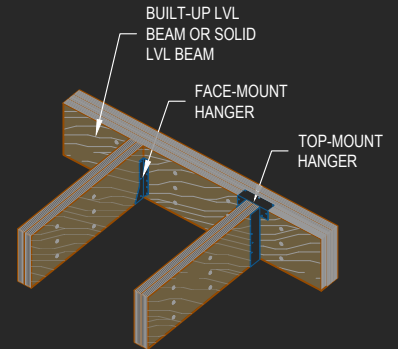
4 BEARING AT OPENING HEADER COND-3



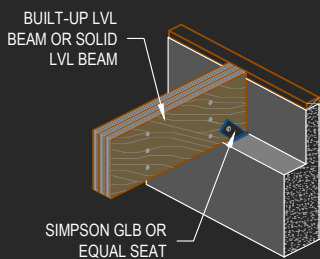
5 BEARING AT WOOD OR STEEL COLUMN Verify column capacity and bearing length.



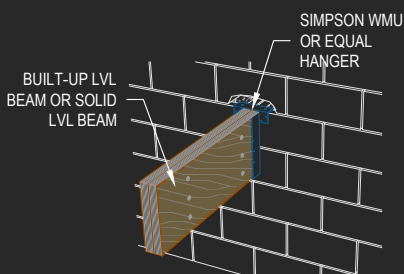
6 BEAM-TO-BEAM CONNECTION Verify column capacity and bearing length.



7 BEARING AT CONCRETE WALL NOTE: Comply with code provisions to prevent direct contact between wood and concrete.



8 BEARING AT MASONRY WALL NOTE: Comply with code provisions to prevent direct contact between wood and concrete.



EVOLUTION LVL BUILT-UP MEMBERS

MULTIPLE PLYS OF **EVOLUTION LVL** MAY BE NAILED OR BOLTED TOGETHER TO FORM BEAMS OR HEADERS OF REQUIRED SIZES.

BUILT-UP MEMBERS MAY BE ASSEMBLED IN VARIOUS PLY COMBINATIONS TO ACHIEVE REQUIRED STRUCTURAL CAPACITY AND SECTION GEOMETRY. TYPICAL BUILT-UP WIDTHS INCLUDE, BUT ARE NOT LIMITED TO:

- UP TO APPROXIMATELY **6" FOR ASSEMBLIES USING 1.5" PLIES**
- UP TO APPROXIMATELY **7" FOR ASSEMBLIES USING 1.75" PLIES**

LARGER OR CUSTOM BUILT-UP SECTIONS MAY BE MANUFACTURED UPON REQUEST DEPENDING ON PROJECT REQUIREMENTS AND PRODUCTION CAPABILITY.

ALL BUILT-UP MEMBERS SHALL BE CONNECTED IN ACCORDANCE WITH APPROVED FASTENING SCHEDULES AND ENGINEERING DESIGN REQUIREMENTS TO ENSURE PROPER LOAD SHARING.

BEARING LENGTH AND CONNECTION DESIGN SHALL BE DETERMINED FOR EACH APPLICATION IN ACCORDANCE WITH APPLICABLE DESIGN STANDARDS.

4. MOISTURE MANAGEMENT

4.1 UNTREATED LVL (INTERIOR)

- ✓ MUST REMAIN IN FULLY ENCLOSED, DRY, CONDITIONED INTERIOR SPACES
- ✗ EXTERIOR EXPOSURE OR WEATHER EXPOSURE — PROHIBITED
- ✗ WET SERVICE CONDITIONS, HIGH HUMIDITY, OR UNCONDITIONED ENVIRONMENTS — PROHIBITED

4.2 UC3B TREATED LVL (EXTERIOR)

- ✓ MUST PROVIDE POSITIVE DRAINAGE AND VENTILATION
- ✓ MUST INSTALL FLASHING ON ALL HORIZONTAL SURFACES
- ✗ SOIL CONTACT, GROUND CONTACT, OR WATER ENTRAPMENT — PROHIBITED

CRITICAL WARNING

UC3B LVL BEAMS AND COLUMNS SHALL NOT BE FULLY WRAPPED, SEALED, OR ENCLOSED IN AIRTIGHT OR NON-VENTILATED ASSEMBLIES. MOISTURE ENTRAPMENT MAY RESULT IN DECAY AND VOID WARRANTY COVERAGE.

MINIMUM CLEARANCES

ABOVE GRADE 8 IN	ABOVE CONCRETE SLAB 1 IN	POST BASE 1 IN
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5. PRODUCT IDENTIFICATION & FIELD INSPECTION

GRADE STAMP SHALL REMAIN VISIBLE AT ALL TIMES. END TAG SHALL IDENTIFY GRADE, TREATMENT LEVEL, AND MANUFACTURER INFORMATION.

ACCEPTABLE CONDITIONS	REJECTION CRITERIA
✓ MINOR SURFACE CHECKING ✓ EDGE CHIPPING ✓ COSMETIC DISCOLORATION ✓ MANUFACTURER STAMP IMPRESSIONS	✗ DELAMINATION ✗ STRUCTURAL SPLITTING ✗ CRUSHING OR LOCALIZED COMPRESSION FAILURE ✗ FIRE DAMAGE ✗ FORKLIFT OR IMPACT DAMAGE

6. APPROVED USES

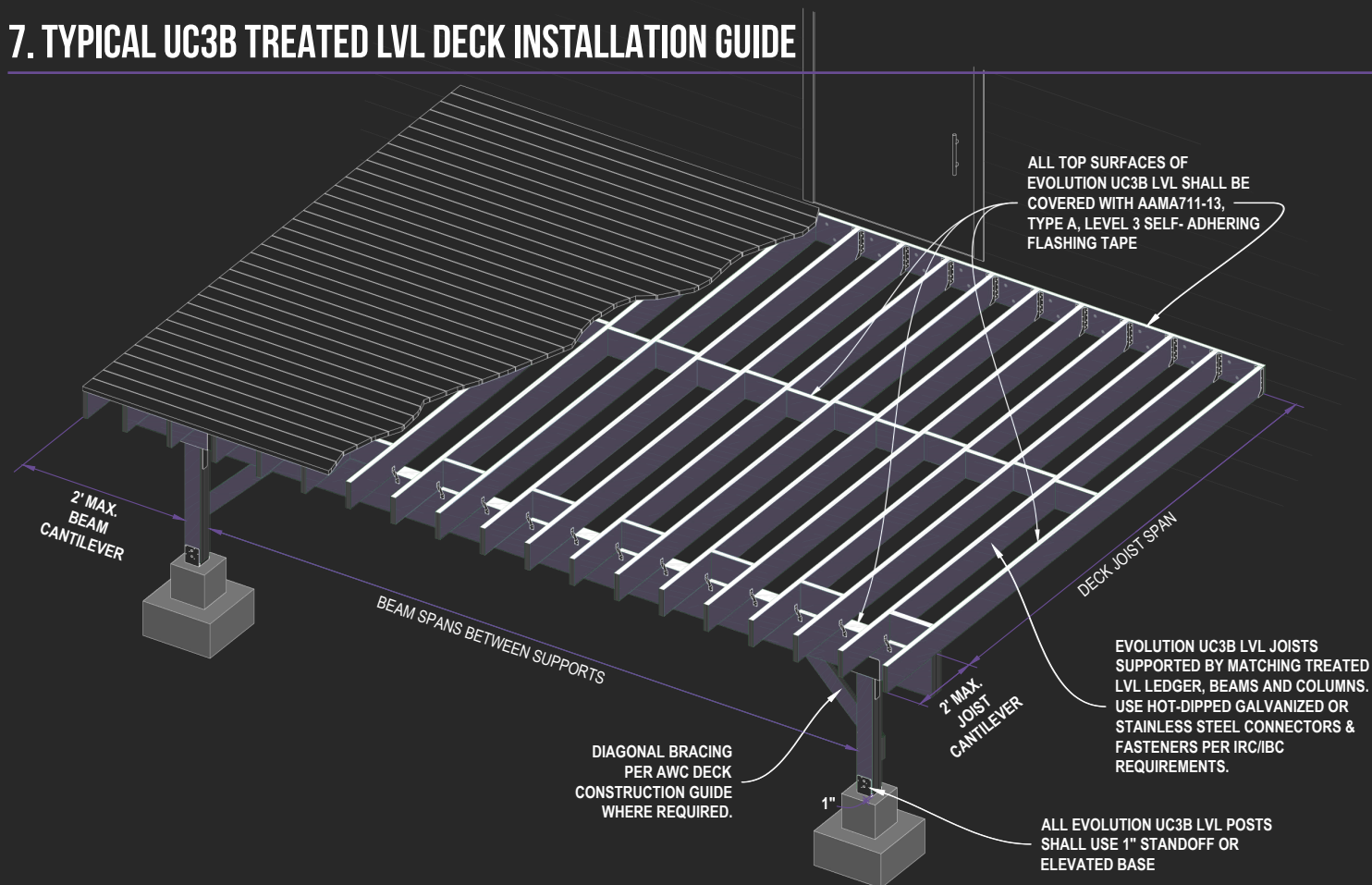
UNTREATED LVL (INTERIOR ONLY)	UC3B TREATED LVL (EXTERIOR ONLY)	PROHIBITED USES (ALL GRADES)
✓ BEAMS ✓ JOISTS ✓ HEADERS ✓ INTERIOR LOAD-BEARING FRAMING ✓ STAIR FRAMING	✓ DECK FRAMING SYSTEMS ✓ PORCHES & PERGOLAS ✓ EXTERIOR BEAMS & COLUMNS ✓ EXTERIOR STAIR STRINGERS	✗ GROUND CONTACT APPLICATIONS ✗ RETAINING WALL SYSTEMS ✗ MARINE OR PERMANENT IMMERSION CONDITIONS

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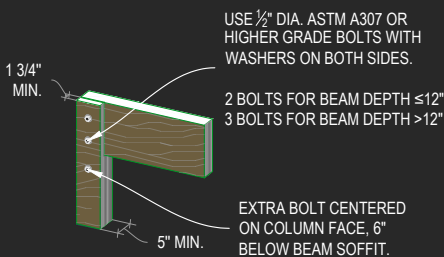
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7. TYPICAL UC3B TREATED LVL DECK INSTALLATION GUIDE

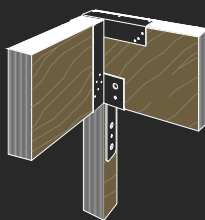


1 TYPICAL NOTCHED LVL COLUMN CONNECTION DETAIL

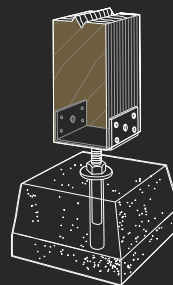


FOR NOTCHED LVL COLUMNS: MIN. 1-3/4" SOLID COLUMN STOCK SHALL RUN FULL HEIGHT UP TO BEAM TOP. ALL NOTCH FACES (TOP, SIDE, BOTTOM) REQUIRE FULL FLASHING PROTECTION.

2 TYPICAL BEAM CORNER STEEL CONNECTION DETAIL



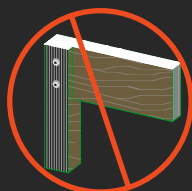
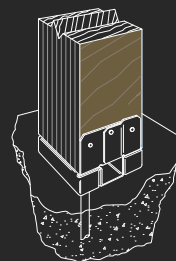
3 ADJUSTABLE STANDOFF POST BASE CONNECTION



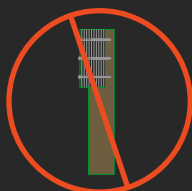
NAILS OR SCREWS WITH A NOMINAL DIAMETER NOT EXCEEDING 0.175" ARE PERMITTED TO BE INSTALLED IN EITHER THE FACE OR THE EDGE OF THE LVL ELEMENT.

COLUMN BOTTOM ELEVATION: MIN. 1" ABOVE CONCRETE, MIN. 8" ABOVE GRADE. ALL UPWARD-FACING SURFACES REQUIRE FLASHING (NOT ALWAYS SHOWN).

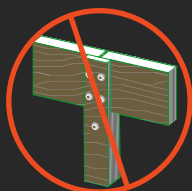
4 ELEVATED POST BASE CONNECTION



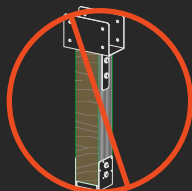
Do not notch such that bolts are through the edge



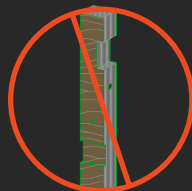
Do not support beams with screws or bolts



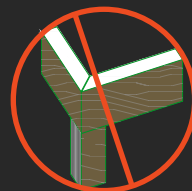
Do not notch at beam splices



Do not install bolts in edge of LVL



Do not drill holes or cut notches



Do not miter beams

8. FASTENERS & CONNECTORS

APPLICATION	FASTENER REQUIREMENT	NOTES
INTERIOR	ZINC-COATED OR ELECTROGALVANIZED (MINIMUM)	--
EXTERIOR (UC3B)	HOT-DIP GALVANIZED OR STAINLESS STEEL	REQUIRED
COASTAL ENVIRONMENTS	TYPE 304 OR 316 STAINLESS STEEL	REQUIRED

CONNECTORS SHALL MATCH THE EXPOSURE CLASSIFICATION REQUIREMENTS. SIMPSON STRONG-TIE® CONNECTORS ARE RECOMMENDED.

9. INSTALLATION REQUIREMENTS

- INSTALL ON THE STRONG AXIS ONLY — FLATWISE LOAD-BEARING INSTALLATION IS STRICTLY PROHIBITED
- TEMPORARY AND PERMANENT BRACING SHALL BE INSTALLED TO PREVENT INSTABILITY, TWIST, OR LATERAL MOVEMENT
- ALL FIELD MODIFICATIONS SHALL COMPLY WITH ENGINEERED DESIGN REQUIREMENTS
- UNAPPROVED NOTCHING, DRILLING, OR CUTTING IS STRICTLY PROHIBITED

FIELD CUT SEALING — UC3B TREATED LVL:

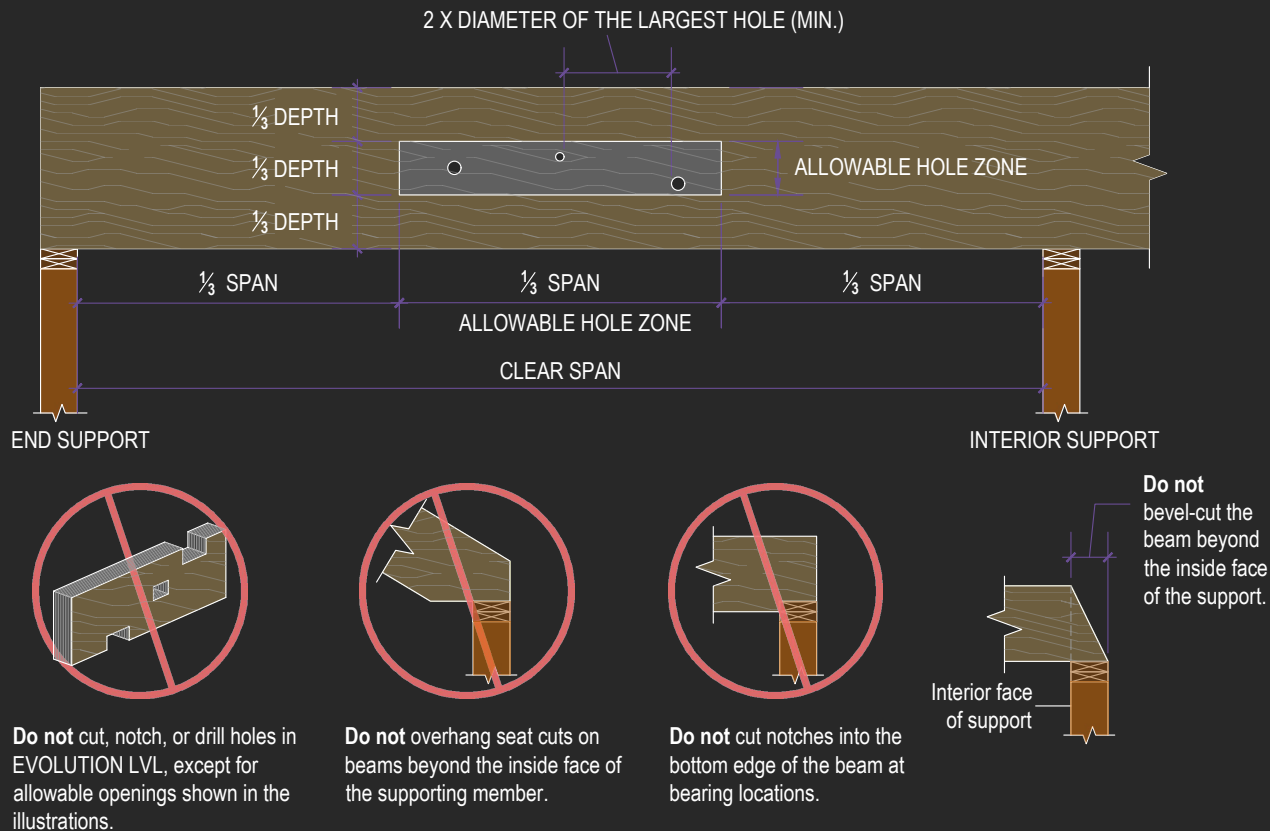
ALL FIELD CUTS, DRILLED HOLES, AND EXPOSED FIBERS SHALL BE IMMEDIATELY SEALED WITH AN APPROVED PRESERVATIVE TREATMENT. UNTREATED LVL: SEALING IS NOT REQUIRED; CLEAN CUTS ARE RECOMMENDED.

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10. ALLOWABLE HOLES



GENERAL NOTES

1. THE HOLE LOCATIONS DEFINED IN THIS DOCUMENT APPLY ONLY TO UNIFORMLY LOADED BEAMS DESIGNED AT THE MAXIMUM ALLOWABLE LOADS FROM OUR PUBLISHED TABLES. ALL OTHER LOAD CASES OR NON-STANDARD HOLE LAYOUTS REQUIRE PRIOR REVIEW AND APPROVAL FROM THE MANUFACTURER.
2. WHERE MULTIPLE HOLES ARE PRESENT ALONG A BEAM, THE CLEAR, UNCUT WEB SEGMENT BETWEEN ANY TWO HOLES SHALL BE AT LEAST TWICE THE DIAMETER OF THE LARGER HOLE.
3. ONLY CIRCULAR HOLES ARE PERMITTED; RECTANGULAR OR SQUARE OPENINGS ARE STRICTLY PROHIBITED.
4. HOLES WITHIN CANTILEVERED SECTIONS ARE NOT COVERED BY THESE RULES AND REQUIRE A SEPARATE STRUCTURAL ANALYSIS.
5. HOLE SIZE AND QUANTITY LIMITS:
 - BEAM DEPTH $\leq 3\frac{1}{2}$ " : MAX HOLE DIAMETER = $\frac{3}{4}$ "
 - BEAM DEPTH = $5\frac{1}{2}$ " : MAX HOLE DIAMETER = $1\frac{1}{8}$ "
 - BEAM DEPTH = $7\frac{1}{4}$ " : MAX HOLE DIAMETER = $1\frac{1}{2}$ "
 - BEAM DEPTH $\geq 9\frac{1}{2}$ " : MAX HOLE DIAMETER = 2"
 - MAXIMUM 3 HOLES PER SPAN UNDER NORMAL LOADING CONDITIONS.

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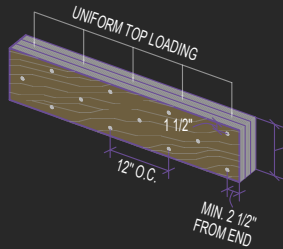
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11. CONNECTION DETAILS

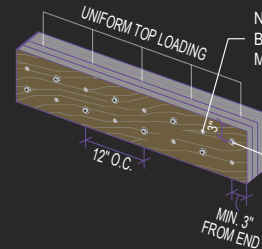
TOP-LOAD MULTI-PLY LVL BEAM

1 NAILED CONNECTION



MIN. NAIL SIZES:
16d BOX (3-1/2" x 0.135") FOR 1-3/4" PLIES
10d BOX (3" x 0.128") FOR 1-1/2" PLIES
2 ROWS FOR DEPTH ≤12"
3 ROWS FOR DEPTH ≤18"
MIN. 4 ROWS FOR DEPTH >18"

2 BOLTED CONNECTION

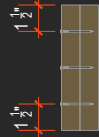
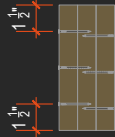
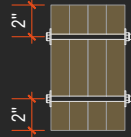


NAILS MAY BE USED
BUT ARE NOT
MANDATORY.

1/2" DIAMETER ASTM
A-307 (OR BETTER)
BOLTS, WITH WASHERS
ON BOTH SIDES.

SIDE-LOAD MULTI-PLY LVL BEAM

3100Fb-2.1E 1 3/4" EVOLUTION® LVL

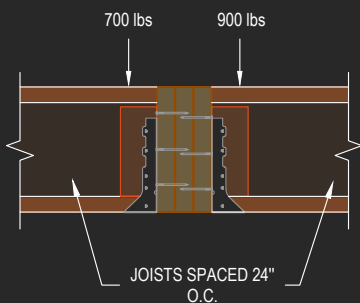
MAXIMUM UNIFORM LOAD (PLF) APPLIED TO EITHER OUTSIDE MEMBER					
			CONDITION A (2)- 1 3/4"	CONDITION B (3)- 1 3/4"	CONDITION C (4)- 1 3/4" *
CONNECTOR	SPACING	ROWS	NAILS ON ONE SIDE OR THROUGH BOLTS	NAILS BOTH SIDES OR THROUGH BOLTS	THROUGH BOLTS ONLY
16d (3 1/2") COMMON NAILS	12" O.C.	2 ROWS	426	320	NOT APPLICABLE
		3 ROWS	639	480	
	6" O.C.	2 ROWS	852	640	NOT APPLICABLE
		3 ROWS	1278	960	
	4" O.C.	2 ROWS	1278	960	NOT APPLICABLE
		3 ROWS	1917	1440	
1/2" A307 THROUGH BOLTS	24" O.C.	2 ROWS	475	356	315
	12" O.C.	2 ROWS	950	712	630
	6" O.C.	2 ROWS	1900	1424	1260

Notes

* Side loading permitted on 4-ply beams only with loads applied to both sides.

1. Nails: Min. 1 1/2" top/bottom edge distance, 2" row spacing, 2 1/2" end setback.
2. Bolts comply with ASME B18.2.1-2012; holes match bolt diameter, min. 2" top/bottom edge distance, washers under head & nut, 3" min. end setback.
3. Confirm beam adequacy from uniform load tables prior to using listed values.
4. Table values based on 100% stress; per code, +15% for snow roofs, +25% for non-snow roofs.

EXAMPLE – SIDE LOAD CONNECTION DESIGN



Given:

- Joist spacing = 24 in. (2 ft)
- Joist reactions = 700 lb and 900 lb

Convert reactions to equivalent side load:

$$700 \div 2 = 350 \text{ plf}$$

$$900 \div 2 = 450 \text{ plf}$$

Required load transfer for the outside

LVL ply:

$$w = 450 \text{ plf}$$

Condition B Connection Check

Connection	Capacity	Status
2 rows 16d nails @ 12" o.c.	320 plf	Not Acceptable
3 rows 16d nails @ 12" o.c.	480 plf	OK
2 rows 1/2" A307 bolts @ 12" o.c.	712 plf	OK

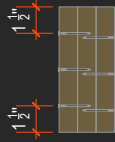
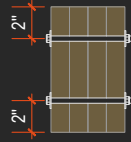
Required: Select a connection with an allowable capacity of at least **450 plf**.

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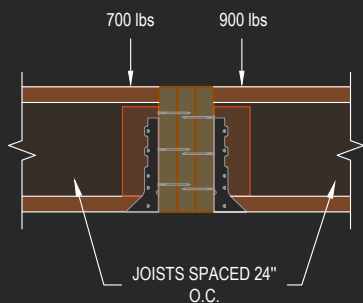
3200Fb-2.3E 1 3/4" EVOLUTION LVL

MAXIMUM UNIFORM LOAD (PLF) APPLIED TO EITHER OUTSIDE MEMBER					
			CONDITION A (2)- 1 3/4"	CONDITION B (3)- 1 3/4"	CONDITION C (4)- 1 3/4" *
CONNECTOR	SPACING	ROWS	NAILS ON ONE SIDE OR THROUGH BOLTS	NAILS BOTH SIDES OR THROUGH BOLTS	THROUGH BOLTS ONLY
16d (3 1/2") COMMON NAILS	12" O.C.	2 ROWS	465	349	NOT APPLICABLE
		3 ROWS	697	524	
	6" O.C.	2 ROWS	930	698	NOT APPLICABLE
		3 ROWS	1394	1048	
	4" O.C.	2 ROWS	1395	1047	NOT APPLICABLE
		3 ROWS	2091	1572	
1/2" A307 THROUGH BOLTS	24" O.C.	2 ROWS	518	388	344
	12" O.C.	2 ROWS	1036	776	688
	6" O.C.	2 ROWS	2072	1552	1376

Notes

- * Side loading permitted on 4-ply beams only with loads applied to both sides.
- 1. Nails: Min. 1 1/2" top/bottom edge distance, 2" row spacing, 2 1/2" end setback.
- 2. Bolts comply with ASME B18.2.1-2012; holes match bolt diameter, min. 2" top/bottom edge distance, washers under head & nut, 3" min. end setback.
- 3. Confirm beam adequacy from uniform load tables prior to using listed values.
- 4. Table values based on 100% stress; per code, +15% for snow roofs, +25% for non-snow roofs.

EXAMPLE – SIDE LOAD CONNECTION DESIGN



Given:

- Joist spacing = 24 in. (2 ft)
- Joist reactions = 700 lb and 900 lb

Convert reactions to equivalent side load:

$$700 \div 2 = 350 \text{ plf}$$

$$900 \div 2 = 450 \text{ plf}$$

Required load transfer for the outside

LVL ply:

$$w = 450 \text{ plf}$$

Condition B Connection Check

Connection	Capacity	Status
2 rows 16d nails @ 12" o.c.	349 plf	Not Acceptable
3 rows 16d nails @ 12" o.c.	524 plf	OK
2 rows 1/2" A307 bolts @ 12" o.c.	776 plf	OK

Required: Select a connection with an allowable capacity of at least **450 plf**.

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12. INSTALLATION CHECKLIST

- ☐ CORRECT GRADE AND PRODUCT IDENTIFICATION VERIFIED
- ☐ FULL BEARING CONTACT CONFIRMED AT ALL SUPPORTS
- ☐ BRACING INSTALLED (TEMPORARY AND PERMANENT)
- ☐ NO UNAPPROVED FIELD MODIFICATIONS PRESENT
- ☐ FIELD CUT SEALING APPLIED TO ALL UC3B TREATED LVL CUTS AND DRILLED HOLES
- ☐ PROPER FASTENERS INSTALLED PER SPECIFICATION
- ☐ MOISTURE PROTECTION AND FLASHING INSTALLED WHERE REQUIRED
- ☐ POSITIVE DRAINAGE AND VENTILATION VERIFIED (UC3B EXTERIOR APPLICATIONS)
- ☐ ALL CONNECTIONS COMPLETED
- ☐ STRUCTURE READY FOR INSPECTION

13. DISCLAIMER

THIS DOCUMENT PROVIDES MINIMUM INSTALLATION REQUIREMENTS ONLY AND SHALL NOT SUPERSEDE PROJECT-SPECIFIC ENGINEERED DESIGN DOCUMENTS, APPLICABLE BUILDING CODES, OR JURISDICTIONAL REQUIREMENTS.

FINAL DESIGN RESPONSIBILITY RESTS WITH THE LICENSED DESIGN PROFESSIONAL OF RECORD.

THE MANUFACTURER ASSUMES NO RESPONSIBILITY FOR IMPROPER INSTALLATION, MODIFICATION, OR MISUSE OF THIS PRODUCT.