

BB-1

BEAM-BEAM FLUSH CONNECTION

PRE-ENGINEERED DOVETAIL HANGER FOR A CONCEALED CONNECTION BETWEEN TWO ORTHOGONAL WOOD MEMBERS		
REV	DATE	DESCRIPTION
0	DEC 2025	SOLUTIONS PAPER: STANDARD CONNECTIONS, ISSUE 1
1	AUG 2026	RE-ISSUED FOR SOLUTIONS PAPER

- DESIGN RECOMMENDATIONS
1.

CONSULT WITH HARDWARE SUPPLIER FOR HANGER RESISTANCES COMPLIANT WITH CSA O86 (LATEST EDITION).
2.

SKEWED MEMBERS MAY REDUCE THE RESISTANCE OF THE HANGER. CONSULT WITH HARDWARE SUPPLIER FOR SPECIFICS.
3.

IT IS RECOMMENDED TO PROVIDE ALTERNATIVE PATHS TO RESIST AXIAL, LATERAL, AND TORSIONAL LOADS AS MOST HANGERS ARE DESIGNED AS SHEAR (VERTICAL) ONLY CONNECTORS. CONSULT WITH HARDWARE SUPPLIER FOR SPECIFICS.
- INSTALLATION
1.

HOUSING ON SECONDARY MEMBER CAN BE A COST-EFFECTIVE OPTION FOR ENCAPSULATED CONNECTIONS WHERE PATCHING IS NOT REQUIRED.
2.

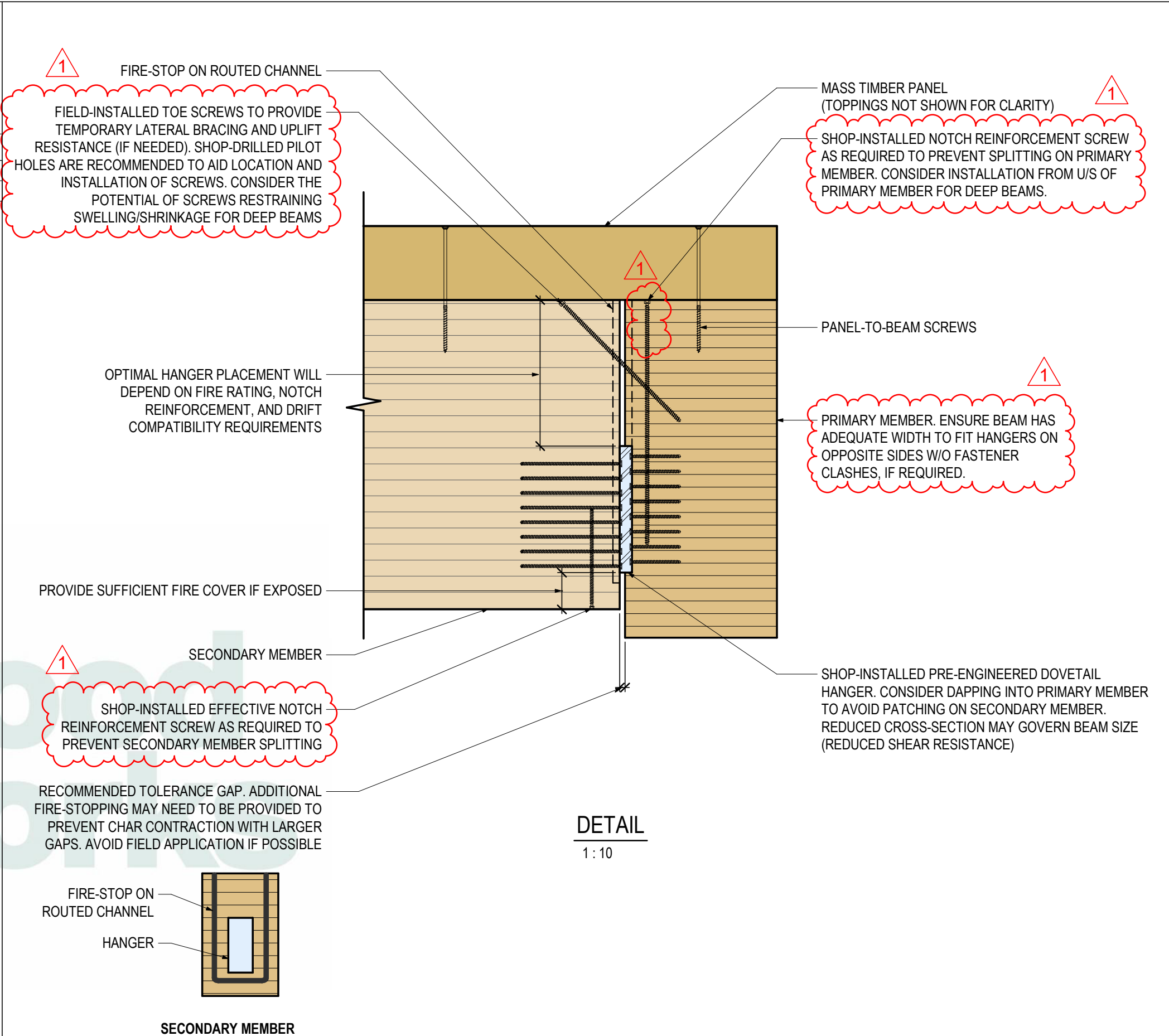
TOP-DOWN BEAM INSTALLATION IS PREFERRED.
3.

REINFORCEMENT SCREWS CAN BE CHALLENGING TO INSTALL DUE TO THEIR LENGTH AND TIGHT TOLERANCES REQUIRED TO NEST IN BETWEEN HANGER SCREWS.
4.

PRE-ENGINEERED HANGERS CAN HAVE TIGHT INSTALLATION TOLERANCES COMPARED TO TYPICAL ERECTION ALLOWANCES.
- DURABILITY
1.

UNPROTECTED STEEL IS PRONE TO RUSTING AND STAINING THE WOOD IF EXPOSED TO MOISTURE DURING CONSTRUCTION.
2.

DETAIL IS INTENDED FOR DRY SERVICE CONDITIONS ONLY.



BB-2

PURLIN-GIRDER DROP CONNECTION

EXPOSED BEARING CONNECTION BETWEEN TWO WOOD MEMBERS

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DESIGN RECOMMENDATIONS

1.

SLOPED PURLINS MAY EXPERIENCE BI-AXIAL BENDING IF NO BLOCKING IS PROVIDED.

2.

IT IS RECOMMENDED CONNECT TOP OF COLUMNS DIRECTLY TO THE DIAPHRAGM, OR PLACE PURLINS/BLOCKING ABOVE COLUMN-TO-BEAM JOINTS TO BRACE THE COLUMNS OUT-OF-PLANE.

INSTALLATION

1.

CONSIDER THE TEMPORARY LATERAL AND TORSIONAL STABILITY OF PURLINS BEFORE THE POSITIVE CONNECTION IS INSTALLED (FRAMING CLIPS OR SCREWS). TEMPORARY ASSEMBLY SCREWS MAY BE REQUIRED.

DURABILITY

1.

UNPROTECTED STEEL IS PRONE TO RUSTING AND STAINING THE WOOD IF EXPOSED TO MOISTURE DURING CONSTRUCTION.

2.

DROP CONNECTIONS ARE MORE SUSCEPTIBLE TO SHRINKAGE DUE TO INCREASED DEPTH OF FRAMING. CUMULATIVE SHRINKAGE FROM PANEL, PURLINS, AND GIRDERS SHOULD BE ACCOUNTED FOR THE DETAILING OF ARCHITECTURAL COMPONENTS.

3.

DETAIL IS INTENDED FOR DRY SERVICE CONDITIONS ONLY.

OPTION A: FRAMING CLIPS
(NO FIRE RATING)

FRAMING CLIPS BOTH SIDES IF NO FIRE RATING IS REQUIRED AND IF VISUALLY ACCEPTABLE

OPTION B: DIAGONAL SCREWS

MASS TIMBER ROOF PANEL
(TOPPINGS NOT SHOWN FOR CLARITY)

PANEL-TO-PURLIN SCREWS

PURLINS

COUNTERSUNK DIAGONAL SELF-TAPPING SCREWS TO PROVIDE LATERAL STABILITY AND UPLIFT RESISTANCE. SHOP-DRILLED PILOT HOLES ARE RECOMMENDED TO AID LOCATION AND INSTALLATION OF SCREWS.

LOCATOR NOTCH RECOMMENDED TO AID PURLIN PLACEMENT. CONSIDER OVERSIZING NOTCH WIDTH NOMINALLY TO PROVIDE PLACEMENT TOLERANCE.

BLOCKING AS REQUIRED FOR LATERAL STABILITY (CROSS-GRAIN BENDING SHOULD BE AVOIDED)

GIRDER

DETAIL

1 : 10

BC-1

BEAM-COLUMN FACE-MOUNTED CONNECTION

PRE-ENGINEERED DOVETAIL HANGER FOR A CONCEALED CONNECTION BETWEEN A WOOD BEAM AND A WOOD COLUMN

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DESIGN RECOMMENDATIONS

1.

CONSULT WITH HARDWARE SUPPLIER FOR HANGER RESISTANCES COMPLIANT WITH CSA O86 (LATEST EDITION).

2.

IT IS RECOMMENDED TO PROVIDE ALTERNATIVE PATHS TO RESIST AXIAL, LATERAL, AND TORSIONAL LOADS AS MOST HANGERS ARE DESIGNED AS SHEAR (VERTICAL) ONLY CONNECTORS.

3.

FACE-MOUNTED HANGERS MAY INDUCE ECCENTRIC LOADING ON THE COLUMN (SHEAR AND MOMENT).

INSTALLATION

1.

HOUSING ON SECONDARY MEMBER CAN BE MORE COST-EFFECTIVE FOR ENCAPSULATED CONNECTIONS WHERE PATCHING IS NOT REQUIRED.

2.

TOP-DOWN BEAM INSTALLATION IS PREFERRED.

3.

REINFORCEMENT SCREWS CAN PRESENT SIGNIFICANT INSTALLATION CHALLENGES DUE TO LENGTH AND TIGHT TOLERANCES REQUIRED TO NEST IN BETWEEN HANGER SCREWS.

4.

THERE ARE POTENTIAL SCREW CLASHES IF HANGERS ARE INSTALLED ON BOTH SIDES OF THE COLUMN. HANGERS CAN BE OFFSET IF A CLASH IS PRESENT.

5.

COLUMN PLACEMENT IS CRITICAL TO BE ABLE TO MEET TIGHT TOLERANCES REQUIRED BY MOST PRE-ENGINEERED HANGERS.

DURABILITY

1.

UNPROTECTED STEEL IS PRONE TO RUSTING AND STAINING THE WOOD IF EXPOSED TO MOISTURE DURING CONSTRUCTION.

2.

DETAIL IS INTENDED FOR DRY SERVICE CONDITIONS ONLY.

DEEP ASSEMBLIES UNDERGOING LARGE SEISMIC DISPLACEMENTS MAY WARRANT A LARGER TOLERANCE GAP BETWEEN FLOOR ELEMENTS (INCLUDING TOPPINGS) AND COLUMNS TO GUARANTEE THE JOINT CAN UNDERGO ROTATION WITHOUT INDUCING PRYING MOMENTS ON THE CONNECTION. IT IS RECOMMENDED TO FILL THE GAP WITH A COMPRESSIBLE MATERIAL

1

FIELD-INSTALLED TOE SCREWS TO PROVIDE TEMPORARY LATERAL BRACING AND UPLIFT RESISTANCE (IF NEEDED). SHOP-DRILLED PILOT HOLES ARE RECOMMENDED TO AID LOCATION AND INSTALLATION OF SCREWS. CONSIDER THE POTENTIAL OF SCREWS RESTRAINING SWELLING/SHRINKAGE FOR DEEP BEAMS AND ROTATION UNDER LARGE LATERAL DISPLACEMENTS

MASS TIMBER PANEL (TOPPINGS NOT SHOWN FOR CLARITY)

PANEL-TO-BEAM SCREWS

OPTIMAL HANGER PLACEMENT WILL DEPEND ON FIRE RATING, NOTCH REINFORCEMENT, AND DRIFT COMPATIBILITY REQUIREMENTS

PROVIDE SUFFICIENT FIRE COVER IF EXPOSED

SECONDARY MEMBER

SHOP-INSTALLED NOTCH REINFORCEMENT SCREW AS REQUIRED TO PREVENT SECONDARY MEMBER SPLITTING

RECOMMENDED TOLERANCE GAP. ADDITIONAL FIRE-STOPPING MAY NEED TO BE PROVIDED TO PREVENT CHAR CONTRACTION WITH LARGER GAPS. AVOID FIELD APPLICATION IF POSSIBLE

FIRE-STOP ON ROUTED CHANNEL

HANGER

SECONDARY MEMBER

DETAIL

1 : 10

TIMBER COLUMN

COLUMN SPLICE (CONNECTION NOT SHOWN FOR CLARITY)

1

ADDITIONAL DAPPING REQUIRED FOR INSTALLATION OF BEAM IF CONNECTOR IS DAPPED INTO COLUMN.

TIMBER COLUMN. ENSURE ADEQUATE DIMENSIONS TO FIT HANGERS ON OPPOSITE SIDES W/O FASTENER CLASHES, IF REQUIRED.

FIRE-STOP ON ROUTED CHANNEL

SHOP-INSTALLED PRE-ENGINEERED DOVETAIL HANGER. CONSIDER DAPPING INTO COLUMN TO AVOID PATCHING ON SECONDARY MEMBER. REDUCED CROSS-SECTION MAY GOVERN COLUMN SIZE

BC-2

BEAM-STEEL COLUMN FACE
MOUNTED CONNECTION

CUSTOM KNIFE PLATE HANGER FOR A CONCEALED CONNECTION BETWEEN
A WOOD BEAM AND A STEEL COLUMN

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DESIGN RECOMMENDATIONS

- FACE-MOUNTED HANGERS MAY INDUCE ECCENTRIC LOADING ON THE COLUMN (SHEAR AND MOMENT).
- A DOUBLE KNIFE PL ASSEMBLY MAY BE MORE EFFICIENT FOR WIDER BEAMS AS IT MINIMIZES THE THICKNESS OF THE BEARING PLATE.
- BUCKET HANGER CAN BE A COST-EFFECTIVE OPTION FOR ENCAPSULATED CONNECTIONS.
- AVOID WELDED CONNECTORS WITH LOW TOLERANCE SUCH AS PRE-ENGINEERED DOVETAIL HANGERS.

INSTALLATION

- TOP-DOWN BEAM INSTALLATION IS PREFERRED.

DURABILITY

- UNPROTECTED STEEL IS PRONE TO RUSTING AND STAINING THE WOOD IF EXPOSED TO MOISTURE DURING CONSTRUCTION.
- DETAIL IS INTENDED FOR DRY SERVICE CONDITIONS ONLY.

DEEP ASSEMBLIES UNDERGOING LARGE SEISMIC DISPLACEMENTS MAY WARRANT A LARGER TOLERANCE GAP BETWEEN FLOOR ELEMENTS (INCLUDING TOPPINGS) AND COLUMNS TO GUARANTEE THE JOINT CAN UNDERGO ROTATION WITHOUT INDUCING PRYING MOMENTS ON THE CONNECTION. IT IS RECOMMENDED TO FILL THE GAP WITH A COMPRESSIBLE MATERIAL

OVERSIZED SLOT CUT FOR INCREASED TOLERANCES

MASS TIMBER PANEL
(TOPPINGS NOT SHOWN FOR CLARITY)

OPTIONAL SHOP-INSTALLED BEARING REINFORCEMENT SCREWS TO REDUCE BEARING PL LENGTH AND LOAD ECCENTRICITY (ALLOWS FOR A MORE OPTIMIZED STEEL ASSEMBLY). AVOID IF WOOD SHIMS ARE USED FOR LEVELING

SHOP-WELDED STEEL ASSEMBLY. IT IS RECOMMENDED THAT THE KNIFE PL EXTENDS THROUGH MOST OF THE BEAM DEPTH TO PROVIDE ADEQUATE LATERAL AND TORSIONAL BRACING

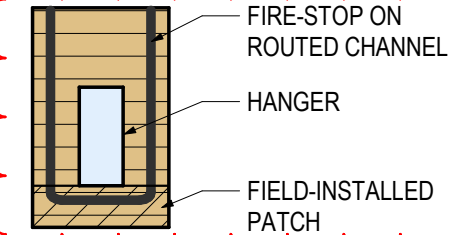
SECONDARY MEMBER

PROVIDE SUFFICIENT FIRE COVER IF EXPOSED

FIELD-INSTALLED COUNTERSUNK SELF-TAPPING SCREWS INSTALLED FROM U/S OF BEARING PL TO PROVIDE TEMPORARY LATERAL BRACING AND UPLIFT RESISTANCE

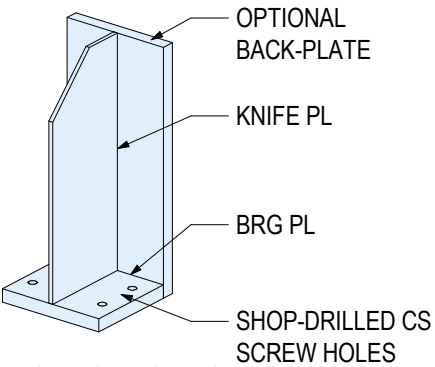
1 SHOP-INSTALLED NOTCH REINFORCEMENT SCREW AS REQUIRED TO PREVENT SECONDARY MEMBER SPLITTING
FIELD-INSTALLED FULL WIDTH PATCH TO CONCEAL STEEL HARDWARE FASTENING TO GLULAM BEAM REQUIRED AND IS NOT SHOWN.
MECHANICAL FASTENERS ARE RECOMMENDED EVEN IF FIRE-RATED ADHESIVES ARE USED.

ADDITIONAL FIRE-STOPPING MAY NEED TO BE PROVIDED TO PREVENT CHAR CONTRACTION WITH LARGER GAPS. AVOID FIELD APPLICATION IF POSSIBLE 1



STEEL COLUMN

OPTIONAL BACK-PLATE CAN BE PROVIDED TO AVOID LOADING THE COLUMN WALL WITH ECCENTRIC LOADING 1



DETAIL
1 : 10

BW-1

BEAM-RC WALL FACE-MOUNTED CONNECTION

CUSTOM KNIFE PLATE HANGER FOR A CONCEALED CONNECTION BETWEEN A WOOD BEAM AND A CONCRETE WALL

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DESIGN RECOMMENDATIONS

- FACE-MOUNTED HANGERS MAY INDUCE ECCENTRIC LOADING ON THE WALL (SHEAR AND MOMENT).
- A DOUBLE KNIFE PL ASSEMBLY MAY BE MORE EFFICIENT FOR WIDER BEAMS AS IT MINIMIZES THE THICKNESS OF THE BEARING PLATE.
- BUCKET HANGER CAN BE A COST-EFFECTIVE OPTION FOR ENCAPSULATED CONNECTIONS.
- AVOID WELDED CONNECTORS WITH LOW TOLERANCE SUCH AS PRE-ENGINEERED DOVETAIL HANGERS.

INSTALLATION

- TOP-DOWN BEAM INSTALLATION IS PREFERRED.
- CAST-IN PLACE ANCHORS ARE PREFERRED TO AVOID POTENTIAL CLASHES BETWEEN POST-INSTALLED ANCHORS AND WALL REINFORCEMENT.

DURABILITY

- UNPROTECTED STEEL IS PRONE TO RUSTING AND STAINING THE WOOD IF EXPOSED TO MOISTURE DURING CONSTRUCTION.
- DETAIL IS INTENDED FOR DRY SERVICE CONDITIONS ONLY.

DEEP ASSEMBLIES UNDERGOING LARGE SEISMIC DISPLACEMENTS MAY WARRANT A LARGER TOLERANCE GAP BETWEEN FLOOR ELEMENTS (INCLUDING TOPPINGS) AND COLUMNS TO GUARANTEE THE JOINT CAN UNDERGO ROTATION WITHOUT INDUCING PRYING MOMENTS ON THE CONNECTION. IT IS RECOMMENDED TO FILL THE GAP WITH A COMPRESSIBLE MATERIAL

FIELD CUT BEAM OR PROVIDE SUFFICIENT TOLERANCE FOR CONCRETE

OVERSIZED SLOT CUT FOR INCREASED TOLERANCES

MASS TIMBER PANEL (TOPPINGS NOT SHOWN FOR CLARITY)

SECONDARY MEMBER. CONSIDER FABRICATING TO A LONGER LENGTH THAN NEEDED AND CUTTING ON SITE TO ACCOUNT FOR POTENTIAL CONCRETE MISALIGNMENT

OPTIONAL SHOP-INSTALLED BEARING REINFORCEMENT SCREWS TO REDUCE BEARING PL LENGTH AND LOAD ECCENTRICITY (ALLOWS FOR A MORE OPTIMIZED STEEL ASSEMBLY). AVOID IF WOOD SHIMS ARE USED FOR LEVELING

PRE-WELDED KNIFE AND BEARING PL ASSEMBLY, FIELD-WELDED TO EMBED PL TO ACCOUNT FOR POSSIBLE CONCRETE MISALIGNMENT. IT IS RECOMMENDED THAT THE KNIFE PL EXTENDS THROUGH MOST OF THE BEAM DEPTH TO PROVIDE ADEQUATE LATERAL AND TORSIONAL BRACING

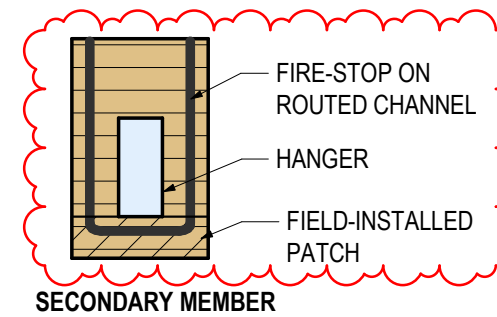
PROVIDE SUFFICIENT FIRE COVER IF EXPOSED

FIELD-INSTALLED COUNTERSUNK SELF-TAPPING SCREWS INSTALLED FROM U/S OF BEARING PL TO PROVIDE TEMPORARY LATERAL BRACING AND UPLIFT RESISTANCE

SHOP-INSTALLED NOTCH REINFORCEMENT SCREW AS REQUIRED TO PREVENT SECONDARY MEMBER SPLITTING

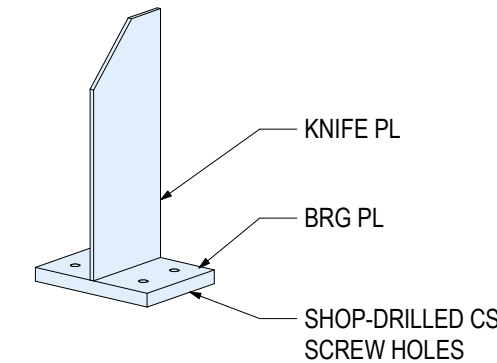
FIELD-INSTALLED FULL WIDTH PATCH TO CONCEAL STEEL HARDWARE FASTENING TO GLULAM BEAM REQUIRED AND IS NOT SHOWN. MECHANICAL FASTENERS ARE RECOMMENDED EVEN IF FIRE-RATED ADHESIVES ARE USED.

ADDITIONAL FIRE-STOPPING MAY NEED TO BE PROVIDED TO PREVENT CHAR CONTRACTION WITH LARGER GAPS. AVOID FIELD APPLICATION IF POSSIBLE



REINFORCED CONCRETE WALL

EMBED STEEL PL (CONNECTION TO CONCRETE NOT SHOWN). OVERSIZE TO ACCOUNT FOR POTENTIAL CONCRETE MISALIGNMENT. CONSIDER ECCENTRICITY OF THE BEARING PL ON THE CONCRETE ANCHOR DESIGN



DETAIL

1 : 10

CC-1			COLUMN CONNECTIONS
CUSTOM SPLICE CONNECTION BETWEEN TWO WOOD COLUMNS			
CUSTOM BASE CONNECTION BETWEEN WOOD COLUMN AND FND			
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DESIGN RECOMMENDATIONS

- COLUMN CONNECTIONS SHOULD BE DESIGNED TO PROVIDE LATERAL BRACING FOR THE COLUMN AS WELL AS POSITIVE CONNECTION FOR UPLIFT.
- ENSURE THE COLUMN IS LATERALLY BRACED ON BOTH ENDS THROUGH A DIRECT CONNECTION TO THE DIAPHRAGM OR AN ALTERNATIVE LOAD PATH.

INSTALLATION

- TEMPORARY BRACING MAY BE REQUIRED BEFORE CONNECTION TO THE DIAPHRAGM IS INSTALLED.
- STEEL ASSEMBLY CAN BE USED TO LIFT THE COLUMN INTO PLACE. ENSURE SCREWS OR OTHER ANCHORS ARE DESIGNED ACCORDINGLY.

DURABILITY

- UNPROTECTED STEEL IS PRONE TO RUSTING AND STAINING THE WOOD IF EXPOSED TO MOISTURE DURING CONSTRUCTION.
- IT IS RECOMMEND TO KEEP COLUMN ENDS ELEVATED TO ENSURE MOISTURE ON THE FLOOR IS NOT ABSORBED THROUGH THE END-GRAIN.
- DETAIL IS INTENDED FOR DRY SERVICE CONDITIONS ONLY.

