Appendix D - Greenstone Building Products Product Literature

- Design Parameters
- Sample Projects
- Sample Standard Details

GREENSTONE ICE PANEL
DESIGN PARAMETERS

The following design parameters are required to streamline Greenstone's Design and Production Process. Designs outside of the below list will be considered complex and will require additional design, drafting and production fees and time lines.

1	Rough Openings (RO's) require a plywood sub-frame/rough buck – please specify if they are ¾" or 1.5".
2	RO's must be a minimum of 5 ¾" from inside corners minimum and 6 ½" between adjacent RO.
3	Greenstone headers require a minimum 8" clearance above, and can not span more than an 11' RO*.
4	Ledge cuts should only be on the bearing wall, and not the walls parallel to main joist runs.
5	5.5" walls are limited to 10' high, beyond which, they must be upgraded to 7.5" wall minimum.
6	After 12' of wall height, there is a cost increase for tall walls.
7	Foundations are limited to 6' backfill pressure maximum from top of basement floor to top of backfill.
8	Heights of walls to be supplied by Greenstone must be clearly dimensioned, especially tall walls and rake walls in vaulted ceiling areas, either to truss or to ladder.
9	Both structural faces of the wall must bear down on a load bearing surface.
10	Top plates can be beneficial in most applications. They are required for RTM foundations.
11	Compound notches on panels are highly complex and will delay time lines and increase cost.

***** Engineered headers can be used to span larger spaces if needed. Product supplied by third party supplier.

GREENSTONE ICE PANEL
QUICK REFERENCE GUIDE

1-Hour FRR (Load Bearing Pre-Fabricated Wall Assembly) • 2 layers Type X gypsum board (min 5/8") • 7.5" ICE Panel w/ 20ga studs @ 16" c/c (max) • 1 layer Exterior covering (see Greenstone QAI design listing B1122-1a for allowable types)	CAN/ULC S101-14/ASTM E119
2-Hour FRR (non-load Bearing Pre-Fabricated Wall Assembly) • 2 layers Type X gypsum board (min 5/8") • 2" offset z bar 20 ga @ 24" c/c (max) • 2" ComfortBoard 80 • 7.5" ICE Panel w/ 20 ga studs @ 16" c/c (max) • 1 layer Exterior Grade Type X gypsum board (min 5/8")	CAN/ULC S101-14/ASTM E119
STC Rating = 35	ASTM E 90-09, E413-10, 1332-10A
Flame Spread Index < 250	CAN/ULC S102.2-10
Smoke Developed Index > 500	CAN/ULC S102.2-10
Type 2 EPS	CAN/ULC S701
Vapour Barrier (when panel joints are sealed with approved caulking or tape)	CAN/ULC S701 Type 2
Structural Capacity • Standard 20 ga panels = 6,570 plf vertical load • HD panels = 21,350 plf vertical load • Basement wall panels = 6' burial depth	ASTM E72 - 2015
Gr 33 G90 Steel Studs and Connectors • minimum yield strength 39ksi	ASTM A653, G90 Galvanized
QAI Evaluation/Listing	Listing B1122-1

R-VALUES

Panel Thickness	5.5"		7.5"		9.25"		11.5"	
Core Material (**EPS**: Expanded Polystrene - Standard **GPS**: Graphite Polystyrene - Premium)	EPS	GPS	EPS	GPS	EPS	GPS	EPS	GPS
EPS R-Value (tested at 24.02°C)	22.91	25.85	31.24	35.25	38.53	43.475	46.00	55.20
THERM Analysis of ICE Panel Assembly	22.18	•	30.24	•	37.3	•	44.53*	•

**estimated based on THERM Analysis of 5.5"-9.25" ICE Panels*

EPS vs GPS — YOU'VE GOT OPTIONS.

Greenstone Building Products offers two selections for the ICE Panel core. Our standard offering being **Expanded Polystyrene (EPS)** and a premium option – **Graphite Polystyrene (GPS)**.

Expanded Polystyrene (EPS) and Graphite Polystyrene (GPS) are Type 2 EPS options available for the core of the ICE Panel. Both options offer identical structural capacity (flexural strength minimums, compressive strength minimums, and density targets). This is set by the CAN/ULC S701.1 standard for EPS insulation.

The graphite does not change the burning behavior or finished foam density. As such, the fire-resistance rating, flame spread/smoke developed index, STC rating, and water vapour permeance remain the same.

WHAT'S THE DIFFERENCE?

Other than the difference in color of the resin bead, the main difference is the superior R-values offered by the GPS option. GPS includes graphite which increases the emissivity of the EPS over standard white EPS, making it more energy efficient. See the comparison chart below for reference.

	Expanded Polystyrene (EPS)	Graphite Polystyrene (GPS)
Bead Color	White	Grey
R-value per Inch	4.0	4.8

Connect with our customer service team to learn more about EPS vs GPS.
Send your emails to info@gsbp.ca or call us at 204-726-1426.

GREENSTONE
BUILDING PRODUCTS

ICE PANEL

SAMPLE PROJECTS

UPDATED AS OF 2024.05.01

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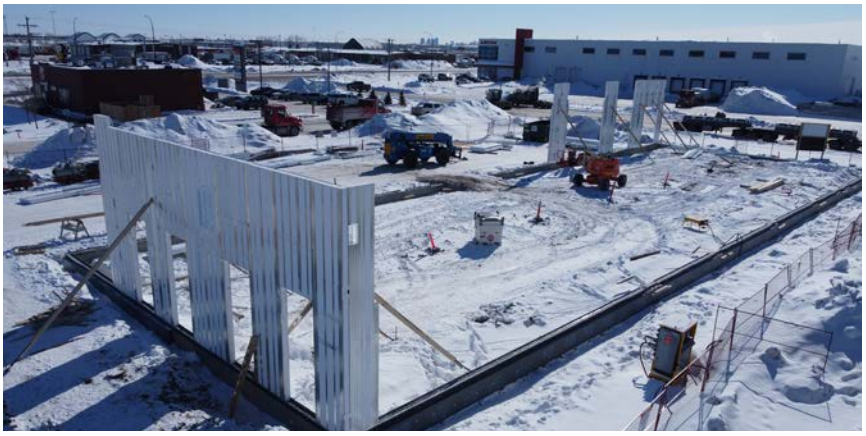
DAVIS WAY COMMERCIAL MULTI-UNIT

WINNIPEG, MB



OBANYE RESIDENCE

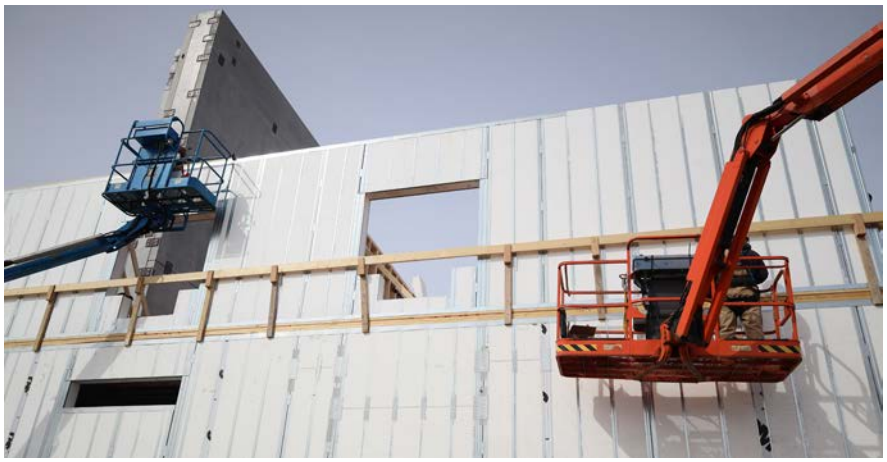
QUESNEL, BC

4 STOREY MULTI-UNIT BUILDING

IQALUIT, NU

BEST WESTERN PLUS HOTEL

NEEPAWA, MB



ADMINISTRATIVE OFFICE SPACE

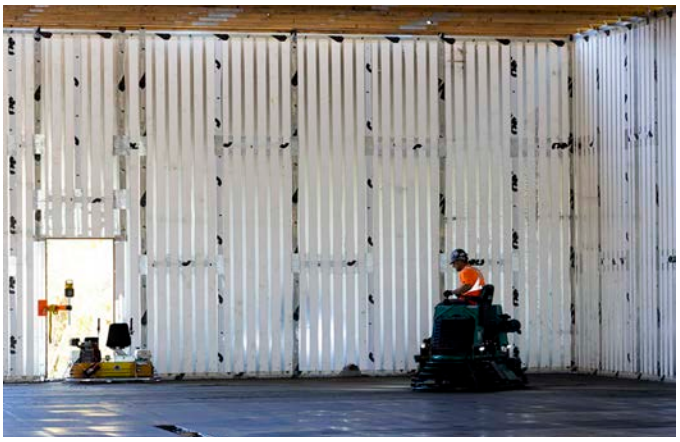
SIOUX VALLEY DAKOTA NATION, MB

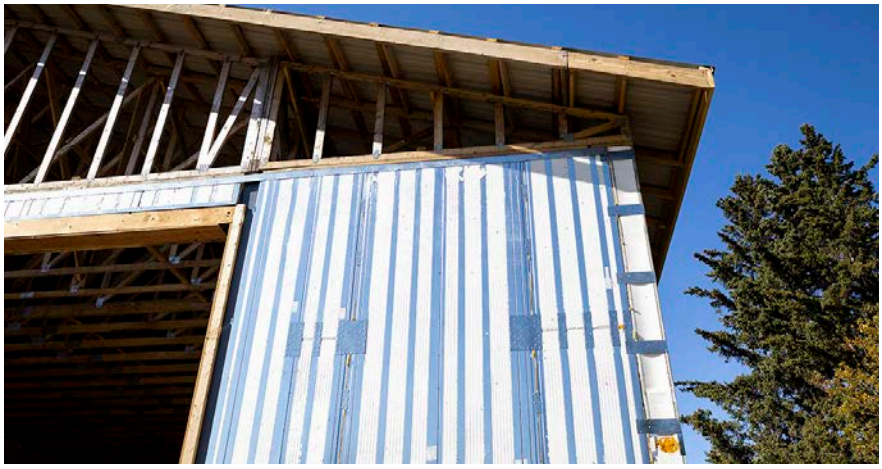
18TH STREET MULTI-UNIT BUILDING

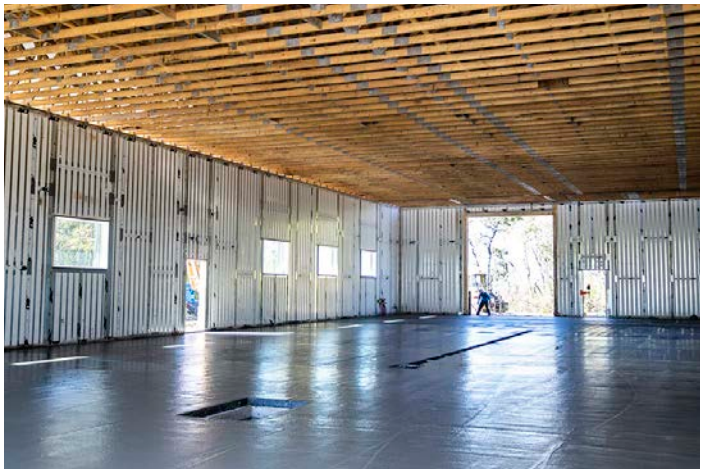
BRANDON, MB

AGRICULTURAL SHOP

RIVERS, MB







RAE RESIDENCE

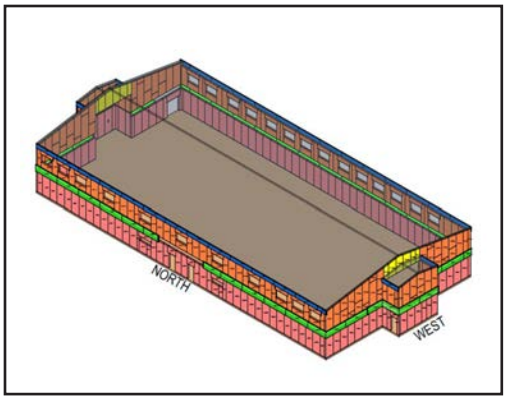
FAIRMONT BANFF SPRINGS, BC

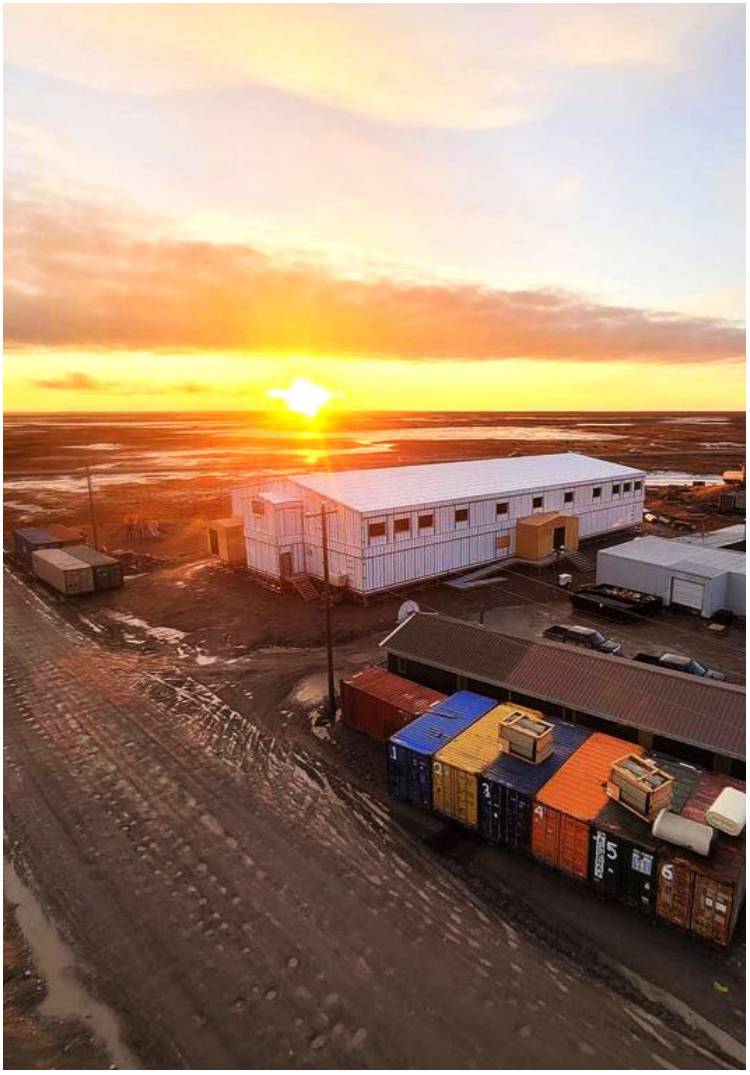
WHEATLAND BAY CUSTOM HOME

BRANDON, MB

HOME HARDWARE

ARVIAT, NU





THE VILLAGE AT PINERIDGE HOLLOW

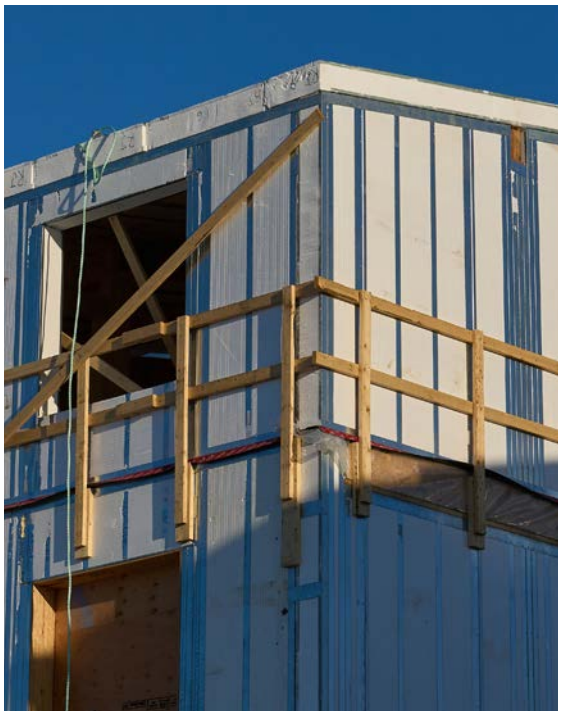
OAKBANK, MB

3 STOREY MULTI-UNIT BUILDING

BRANDON, MB

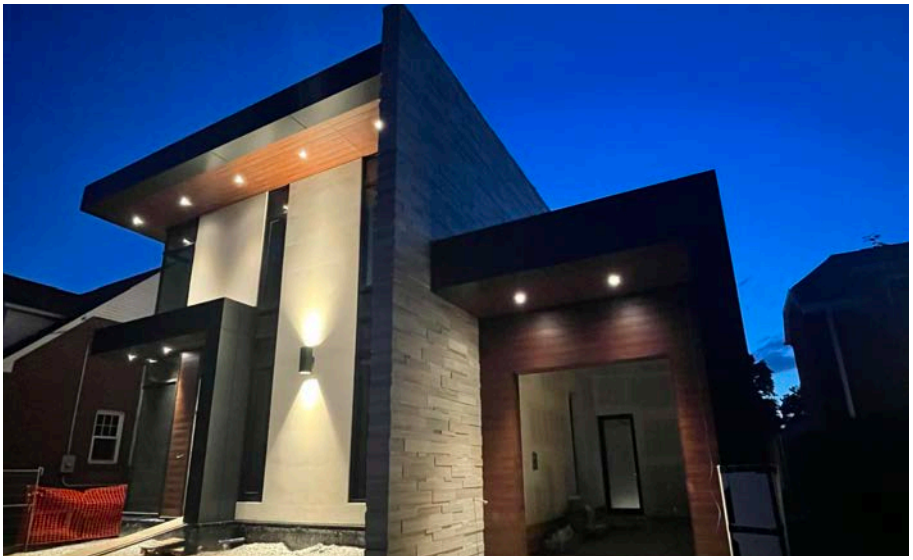
18-PLEX COMMERCIAL BUILDING

IQALUIT, NU



CEVADA RESIDENCE

BRAMPTON, ON

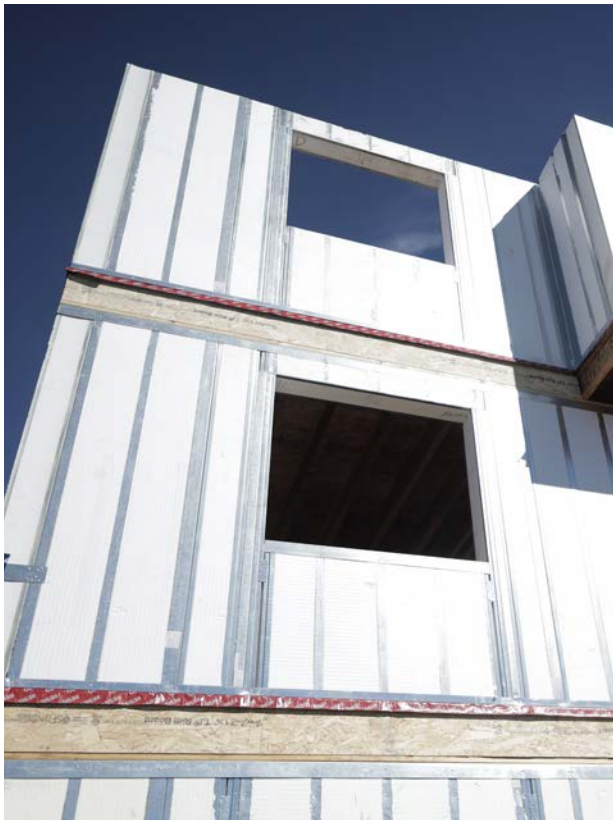


STRAUSE RESIDENCE

MERIDIAN BEACH, AB

HUNTER RESIDENCE

FRANCOIS LAKE, BC

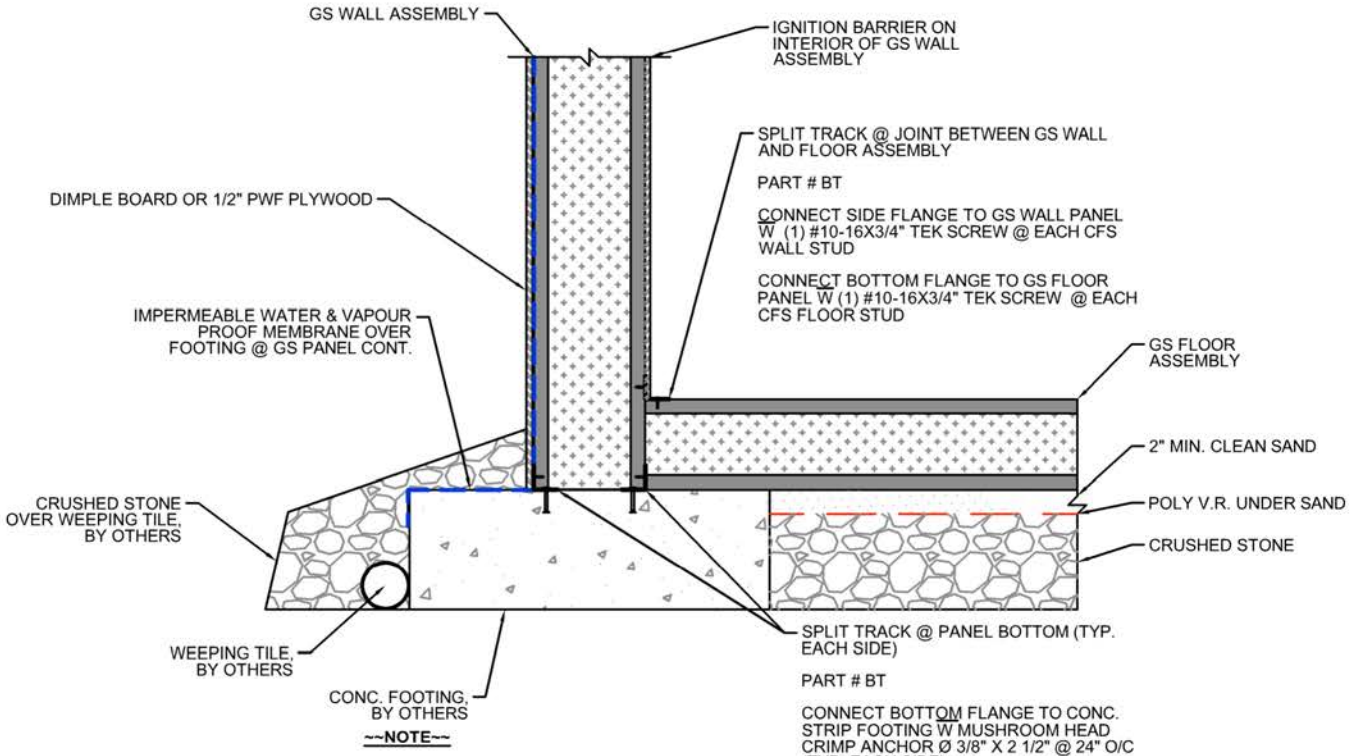


GREENSTONE
BUILDING PRODUCTS

ICE PANEL

STANDARD CONNECTION DETAILS SAMPLE DOCUMENT

UPDATED AS OF 2023.04.04



~~NOTE~~

1. ASSEMBLY AND PROPRIETARY ACCESSORY MATERIALS ARE NOT SPECIFICALLY ENDORSED BY GREENSTONE BUILDING PRODUCTS. DRAWING IS INTENDED TO BE A MINIMUM GUIDELINE FOR DESIGN CONSIDERATIONS. FULL ASSEMBLY TO BE SPECIFIED BY PROJECT ARCHITECT.

2. PLEASE REFER TO GREENSTONE BUILDING PRODUCTS "STANDARD PANEL ASSEMBLY MANUAL" FOR CONSTRUCTION METHODS.

3. **INSTALL CONNECTION PLATES IMMEDIATELY ABOVE BASE TRACK.**

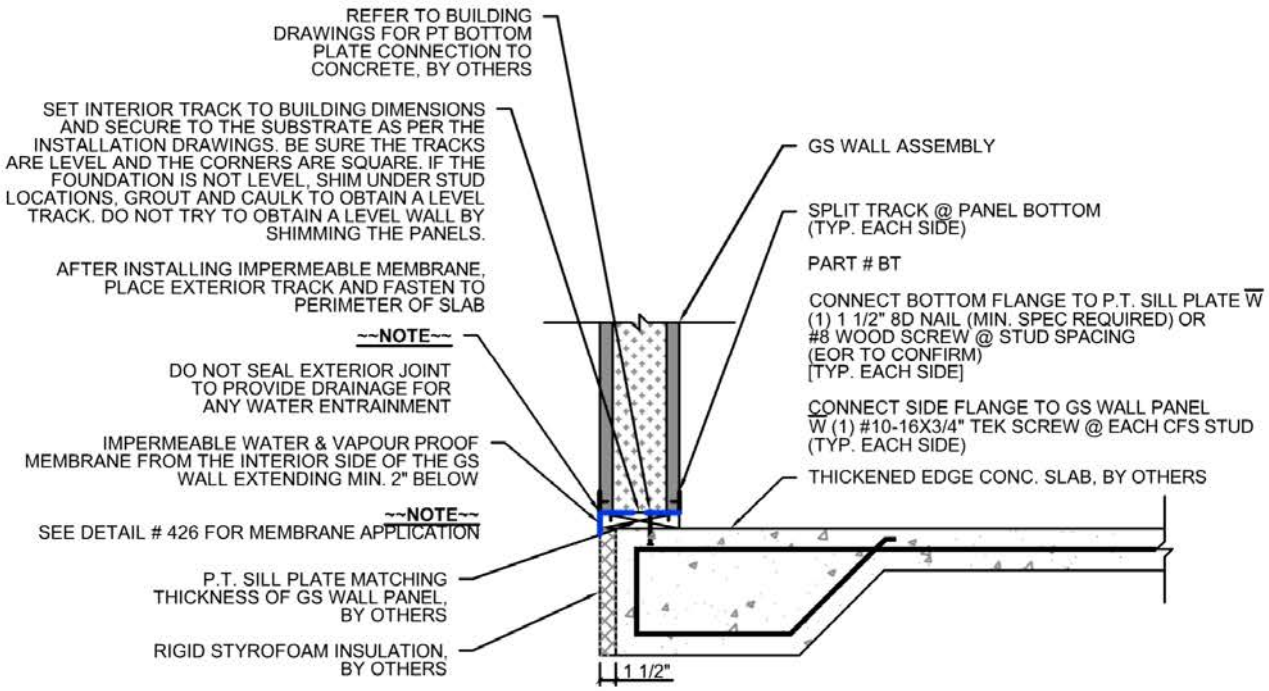
4. MITRE CUT TRACK @ CORNERS

5. FASTENER SPACING TO MATCH WALL STUD SPACING (MAX. 16" O/C).

6. EOR TO CONFIRM TYPE AND SPACING OF FASTENERS BETWEEN TRACK, WALL PANEL, AND SUBSTRATE FOR PROJECT SPECIFIC STRUCTURAL LOAD TRANSFER

GS FLOOR INSTALLATION ONTO CONC. FOOTING (SECTION)

N.T.S. 203



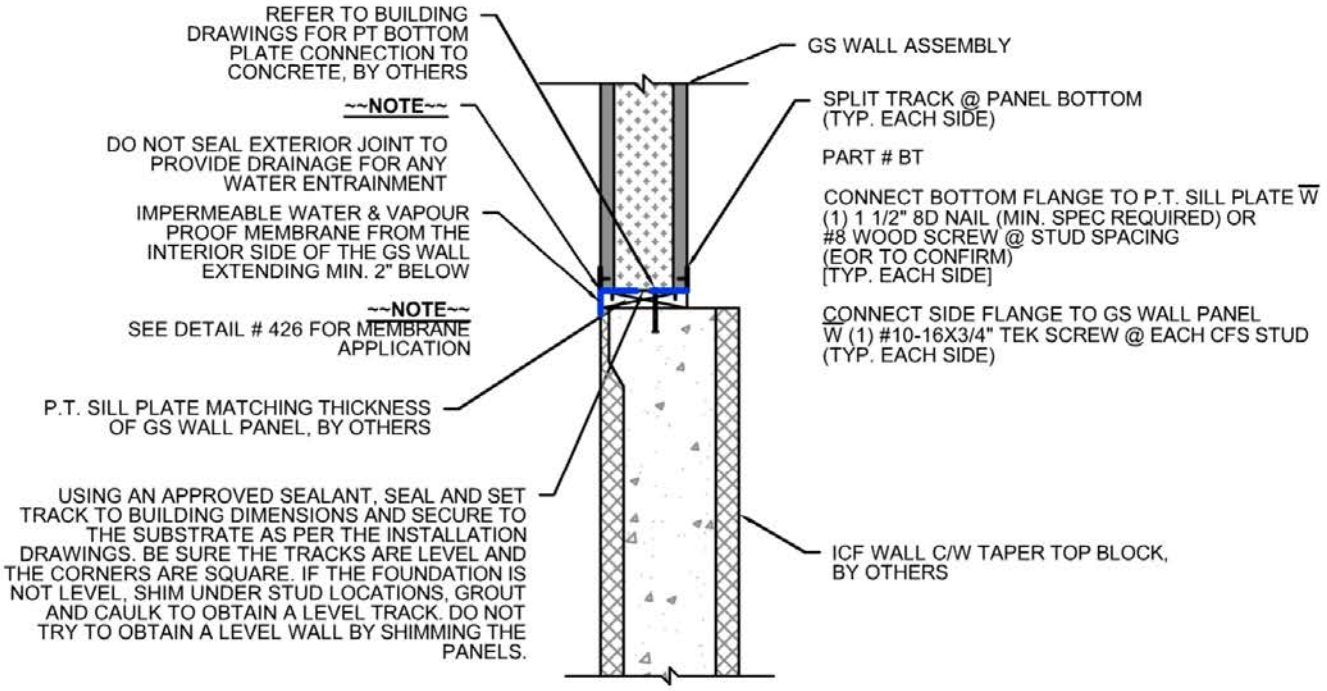
GS SPLIT TRACK ON DOUBLE PT PLATE INSTALLATION ONTO CONC. SLAB (SECTION)

N.T.S. 207

~~NOTE~~

FASTENER SPACING TO MATCH WALL STUD SPACING (MAX. 16" O/C)

EOR TO CONFIRM TYPE AND SPACING OF FASTENERS BETWEEN TRACK, WALL PANEL, AND SUBSTRATE FOR PROJECT SPECIFIC STRUCTURAL LOAD TRANSFER



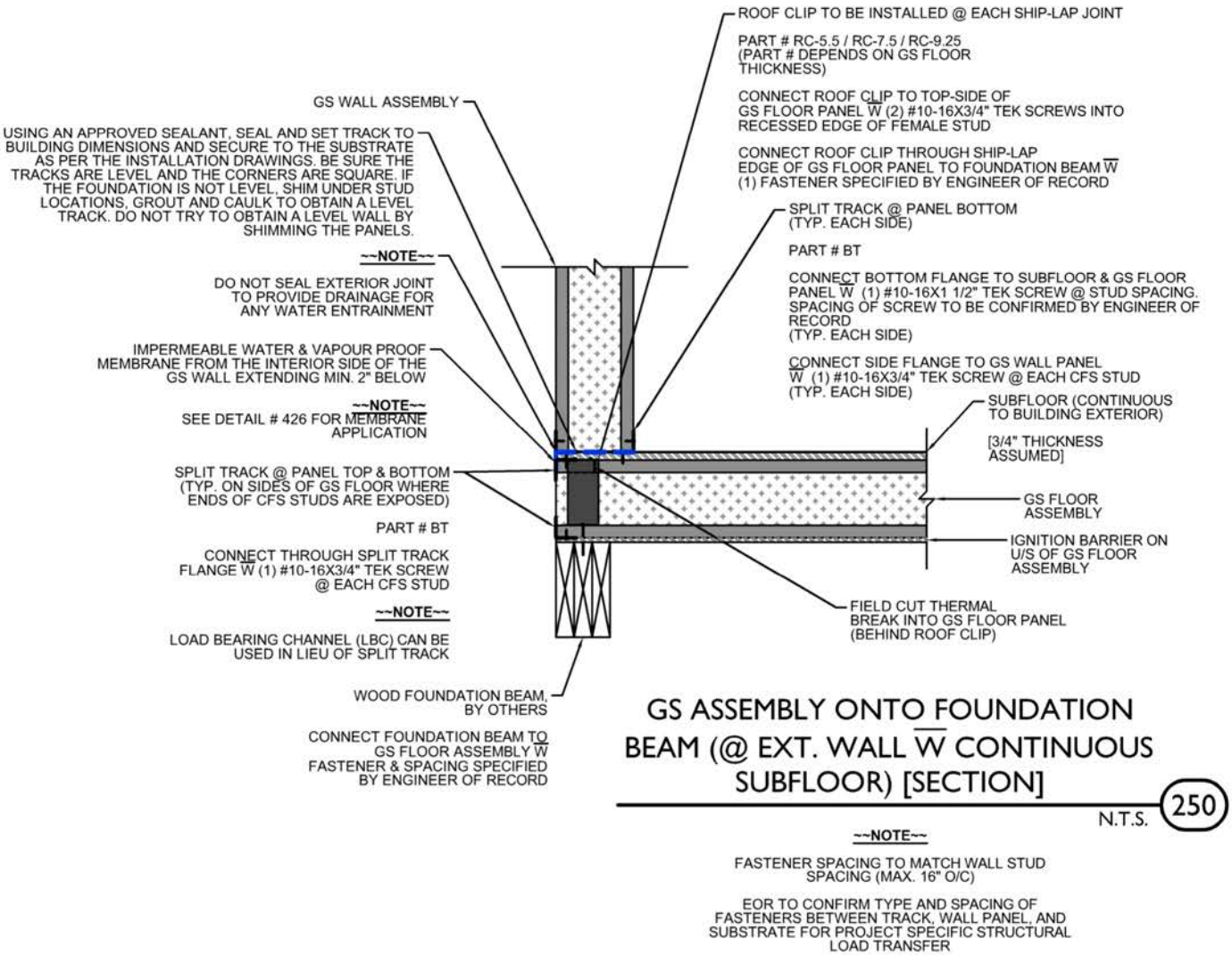
GS SPLIT TRACK ON PT PLATE INSTALLATION ONTO ICF (SECTION) 222

N.T.S.

~~NOTE~~

FASTENER SPACING TO MATCH WALL STUD SPACING (MAX. 16" O/C)

EOR TO CONFIRM TYPE AND SPACING OF FASTENERS BETWEEN TRACK, WALL PANEL, AND SUBSTRATE FOR PROJECT SPECIFIC STRUCTURAL LOAD TRANSFER



GS ASSEMBLY ONTO FOUNDATION BEAM (@ EXT. WALL W CONTINUOUS SUBFLOOR) [SECTION]

N.T.S. 250

~~NOTE~~

FASTENER SPACING TO MATCH WALL STUD SPACING (MAX. 16" O/C)

EOR TO CONFIRM TYPE AND SPACING OF FASTENERS BETWEEN TRACK, WALL PANEL, AND SUBSTRATE FOR PROJECT SPECIFIC STRUCTURAL LOAD TRANSFER

~~NOTE~~
SELF-ADHERED AIR BARRIER RECOMMENDED

SINGLE COMPONENT URETHANE FOAM IS **NOT** APPROVED TO SEAL AIR/VAPOUR AND **NOT** TO BE CONSIDERED AIR TIGHT

IF SELF-ADHERED AIR BARRIER IS **NOT** USED, WEATHER-RESISTIVE BARRIER REQ'D **AND** EXTERIOR BUTT JOINTS (HEADERS, SILLS, & CORNERS) TO BE TAPED

CFS LOAD BEARING CHANNEL (LBC) @ PANEL TOP (TYP. EACH SIDE)

LONG FLANGE OF LBC IS ALWAYS ROTATED TO BE EXPOSED ON THE EXTERIOR FACE OF PANEL (TYP. EACH SIDE)

LBC JOINTS MUST ALWAYS BE CENTERED ON A STUD

PART # LBC

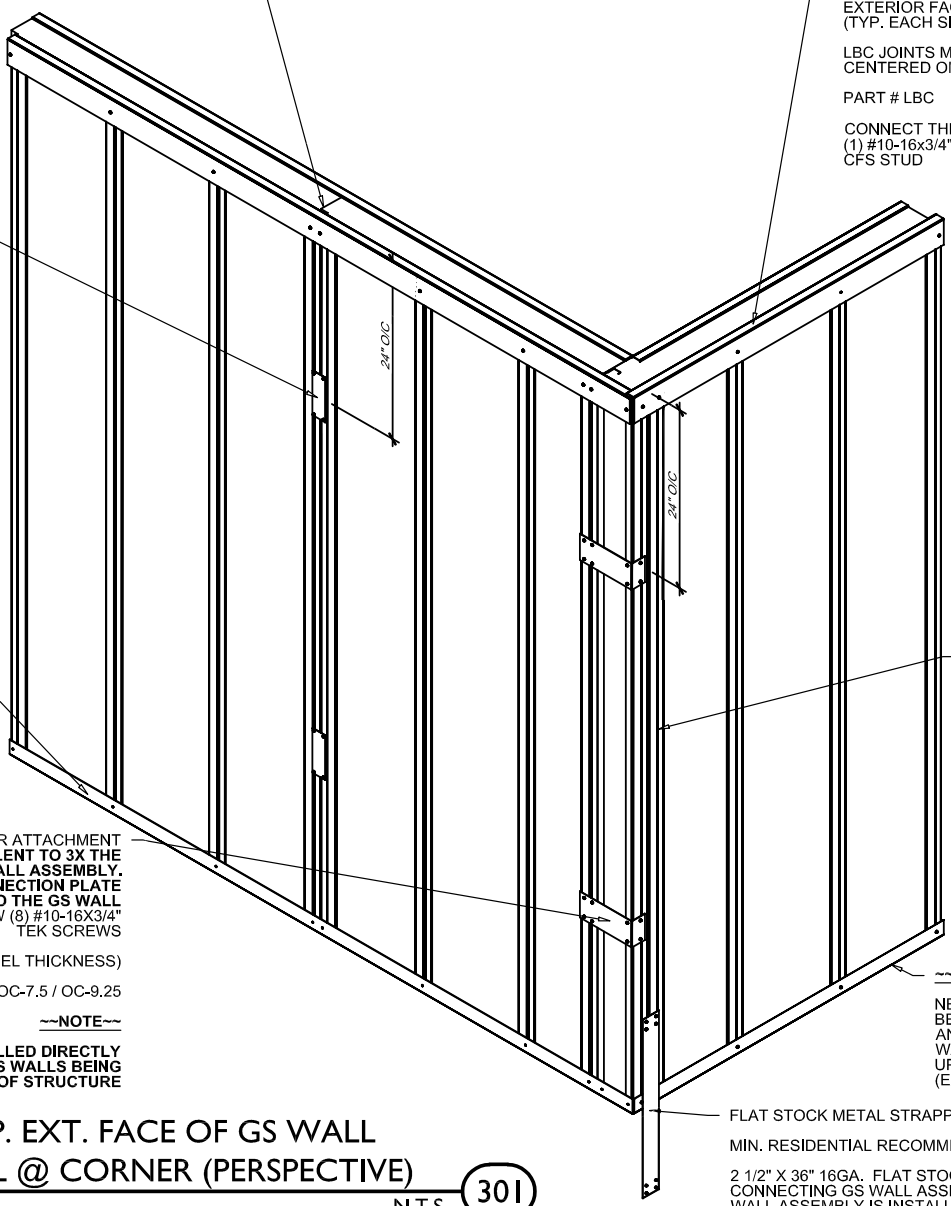
CONNECT THROUGH LBC FLANGE W (1) #10-16x3/4" TEK SCREW @ EACH CFS STUD

CONNECTION PLATE @ **A SPACING EQUIVALENT TO 3X THE STUD SPACING OF THE GS WALL ASSEMBLY. CENTRE OF 1ST CONNECTION PLATE INSTALLED 24" FROM THE T/O THE GS WALL ASSEMBLY.** C/W (4) #10-16X3/4" TEK SCREWS

PART # CP

~~NOTE~~

EXTRA PLATE TO BE INSTALLED DIRECTLY ABOVE SPLIT TRACK IF GS WALLS BEING USED AS FOUNDATION OF STRUCTURE



SPLIT TRACK

PART # BT

CONNECT W (1) #10-16X3/4" TEK SCREW THROUGH TRACK FLANGE @ EACH CFS STUD

ADDITIONAL CORNER STUD TO ALLOW FOR EASE OF SIDING INSTALLATION (PART OF GS WALL PANEL)

OUTSIDE CORNER ATTACHMENT PLATE @ **A SPACING EQUIVALENT TO 3X THE STUD SPACING OF THE GS WALL ASSEMBLY. CENTRE OF 1ST CONNECTION PLATE INSTALLED 24" FROM THE T/O THE GS WALL ASSEMBLY.** C/W (8) #10-16X3/4" TEK SCREWS

(LG CORRESPONDS TO PANEL THICKNESS)

PART # OC-5.5 / OC-7.5 / OC-9.25

~~NOTE~~

EXTRA PLATE TO BE INSTALLED DIRECTLY ABOVE SPLIT TRACK IF GS WALLS BEING USED AS FOUNDATION OF STRUCTURE

~~NOTE~~

NEVER SEAL THE JOINT BETWEEN THE SPLIT TRACK AND THE SUBSTRATE THE GS WALL ASSEMBLY IS INSTALLED UPON.
(EXTERIOR ONLY)

FLAT STOCK METAL STRAPPING

MIN. RESIDENTIAL RECOMMENDATION:

2 1/2" X 36" 16GA. FLAT STOCK METAL STRAPPING CONNECTING GS WALL ASSEMBLY TO SUBSTRATE GS WALL ASSEMBLY IS INSTALLED UPON

STRAPPING OCCURS @:
-EA. SIDE OF WINDOW & DOOR ON EXTERIOR OF WALL
-EA. BUILDING CORNER
-ALONG EXTERIOR WALLS @ 12' O/C MAX. TOTAL SPACING

PART # TIE-DOWN STRAP

EOR TO SPECIFY STRAPPING TYPE, LENGTH & FASTENING SCHEDULE

TYP. EXT. FACE OF GS WALL PANEL @ CORNER (PERSPECTIVE)

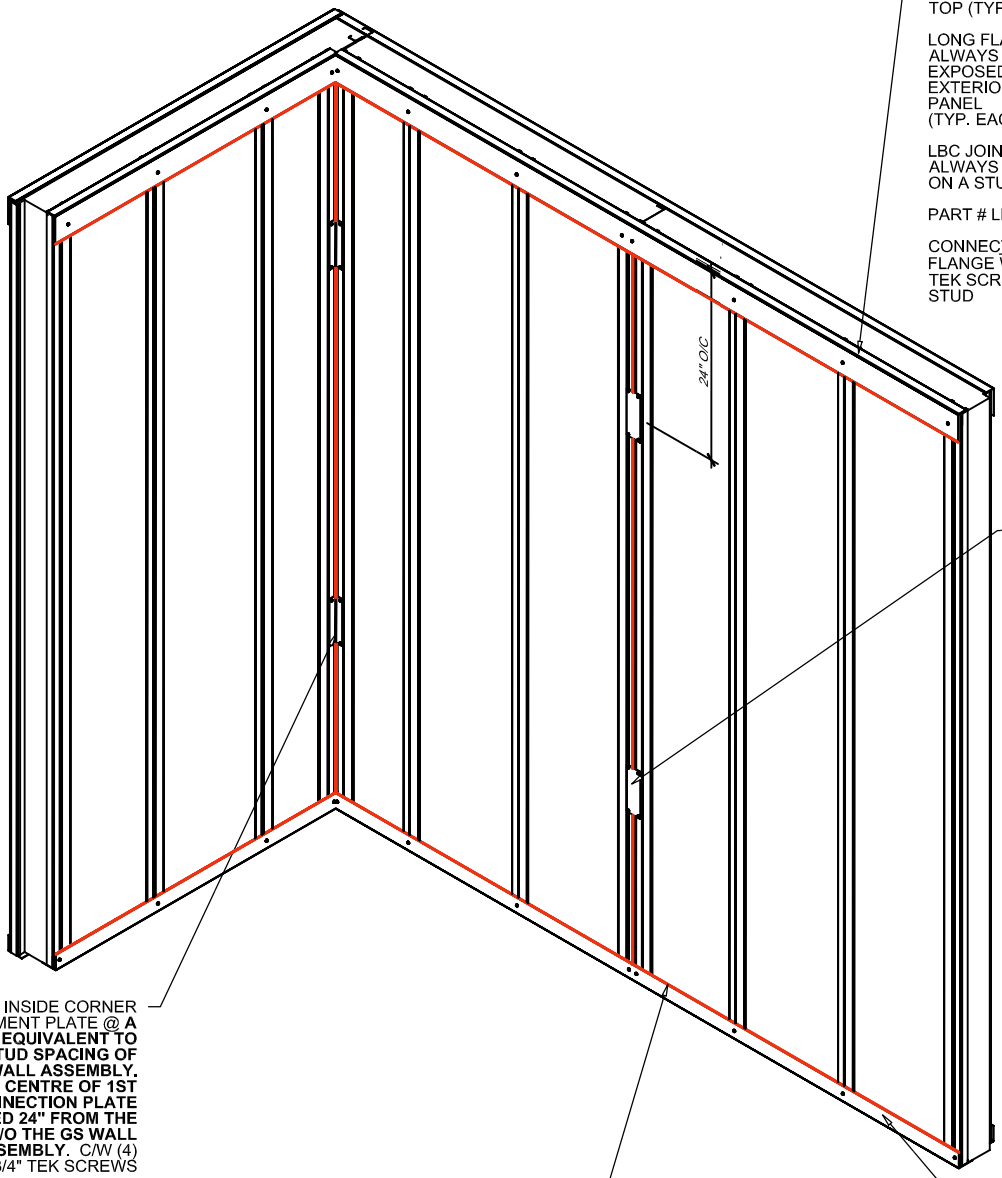
N.T.S.

301

~~NOTE~~

1. GREENSTONE WALL PANELS ARE INSTALLED WITH THE "FRONT OF PANEL" FACING THE OUTSIDE OF THE STRUCTURE.

2. **IF GS WALLS ARE BEING INSTALLED AS A BELOW GRADE INSTALLATION, ALL CONNECTION PLATES MUST BE INSTALLED @ 24" O/C**



CFS LOAD BEARING CHANNEL (LBC) @ PANEL TOP (TYP. EACH SIDE)

LONG FLANGE OF LBC IS ALWAYS ROTATED TO BE EXPOSED ON THE EXTERIOR FACE OF PANEL (TYP. EACH SIDE)

LBC JOINTS MUST ALWAYS BE CENTERED ON A STUD

PART # LBC

CONNECT THROUGH LBC FLANGE W (1) #10-16x3/4" TEK SCREW @ EACH CFS STUD

CONNECTION PLATE @ **A SPACING EQUIVALENT TO 3X THE STUD SPACING OF THE GS WALL ASSEMBLY. CENTRE OF 1ST CONNECTION PLATE INSTALLED 24" FROM THE T/O THE GS WALL ASSEMBLY.** C/W (4) #10-16X3/4" TEK SCREWS

PART # CP

~~NOTE~~

EXTRA PLATE TO BE INSTALLED DIRECTLY ABOVE SPLIT TRACK IF GS WALLS BEING USED AS FOUNDATION OF STRUCTURE

INSIDE CORNER ATTACHMENT PLATE @ **A SPACING EQUIVALENT TO 3X THE STUD SPACING OF THE GS WALL ASSEMBLY. CENTRE OF 1ST CONNECTION PLATE INSTALLED 24" FROM THE T/O THE GS WALL ASSEMBLY.** C/W (4) #10-16X3/4" TEK SCREWS

PART # IC

~~NOTE~~

EXTRA PLATE TO BE INSTALLED DIRECTLY ABOVE SPLIT TRACK IF GS WALLS BEING USED AS FOUNDATION OF STRUCTURE.

APPROVED VAPOUR BARRIER TAPE AT ALL SEAMS INCLUDING BASE TRACK & LBC

SPLIT TRACK

PART # BT

CONNECT W (1) #10-16X3/4" TEK SCREW THROUGH TRACK FLANGE @ EACH CFS STUD

~~NOTE~~

1. GREENSTONE WALL PANELS ARE INSTALLED WITH THE "FRONT OF PANEL" FACING THE OUTSIDE OF THE STRUCTURE.

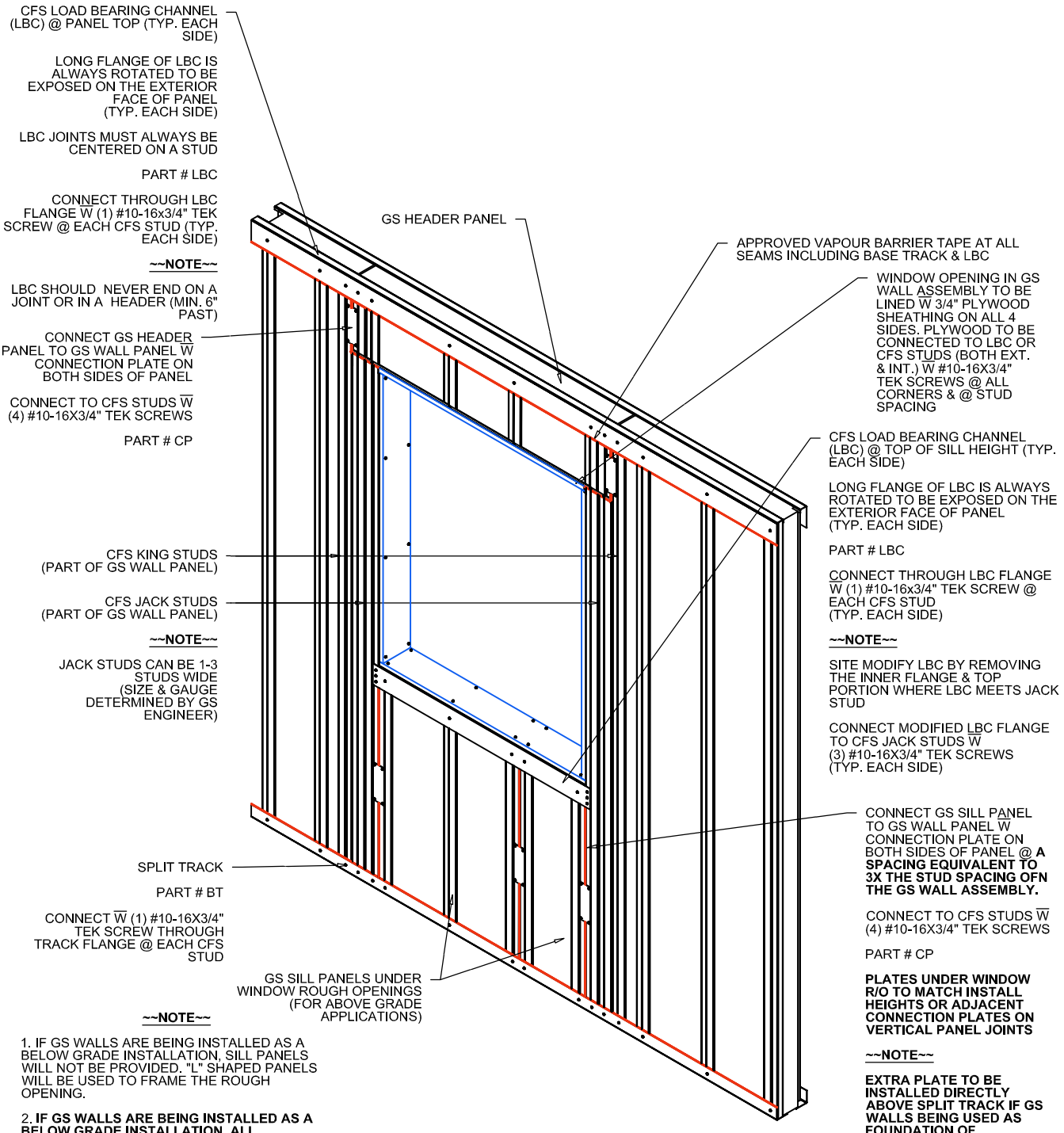
2. **IF GS WALLS ARE BEING INSTALLED AS A BELOW GRADE INSTALLATION, ALL CONNECTION PLATES MUST BE INSTALLED @ 24" O/C**

3. SINGLE COMPONENT URETHANE FOAM IS **NOT** APPROVED TO SEAL AIR/VAPOUR AND **NOT** TO BE CONSIDERED AIR TIGHT

TYP. INT. FACE OF GS WALL PANEL @ CORNER (PERSPECTIVE)

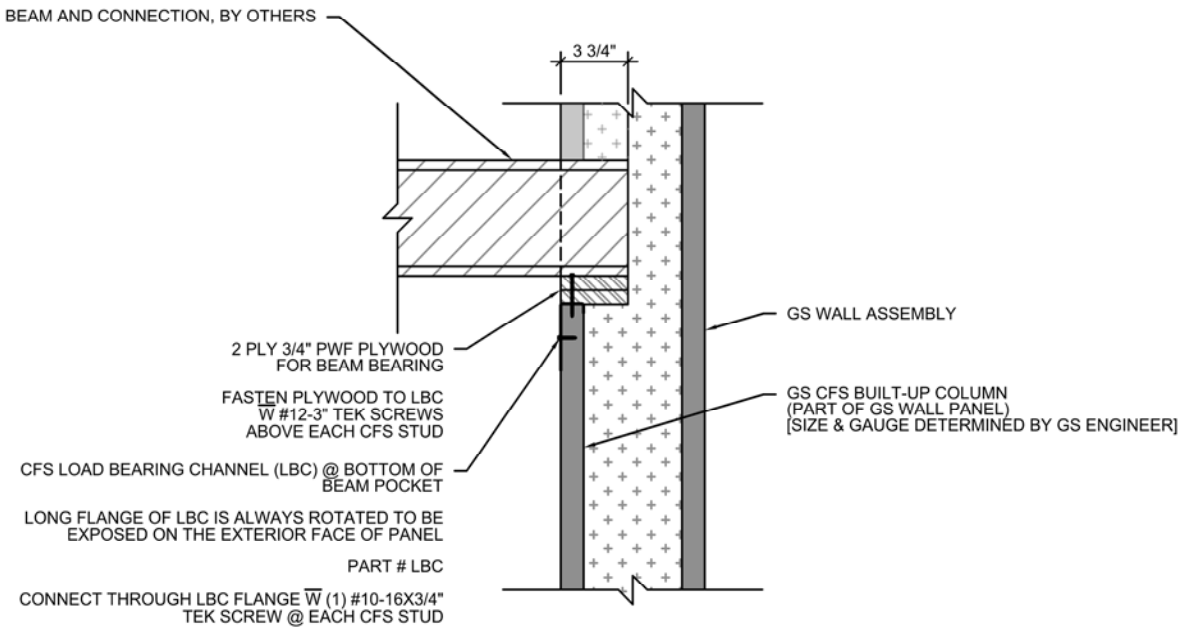
N.T.S.

302



WINDOW ROUGH OPENING (INT.) [PERSPECTIVE]

N.T.S. 341

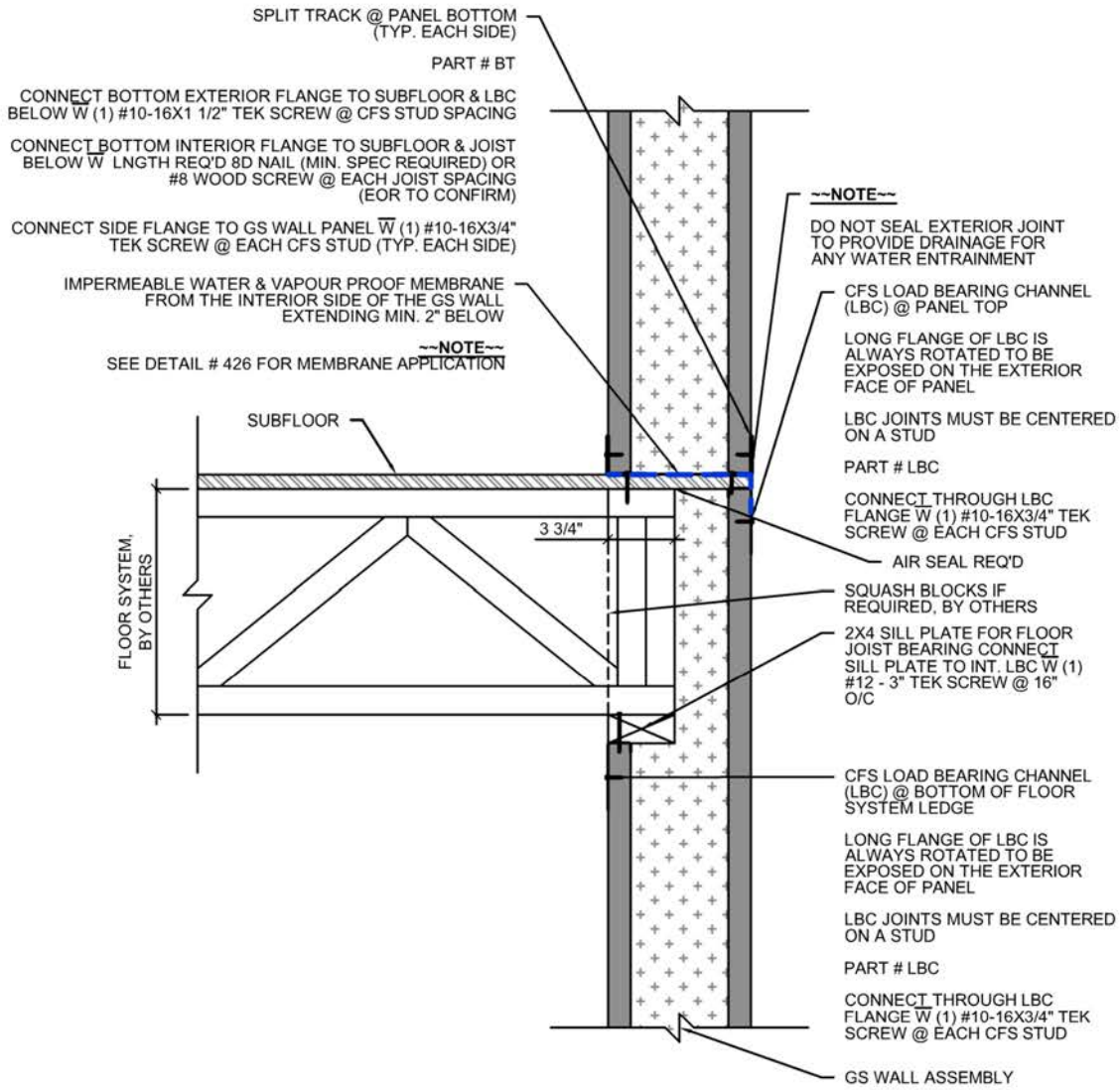


PARTIAL BEAM POCKET (SECTION) 403

N.T.S.

~~NOTE~~

UNDER HEAVIER LOADS A STEEL PLATE OR PIECE OF LVL SHIM MAY BE RECOMMENDED BY THE ENGINEER OF RECORD IN LIEU OF 2 PLY 3/4" PWF PLYWOOD FOR BEAM BEARING



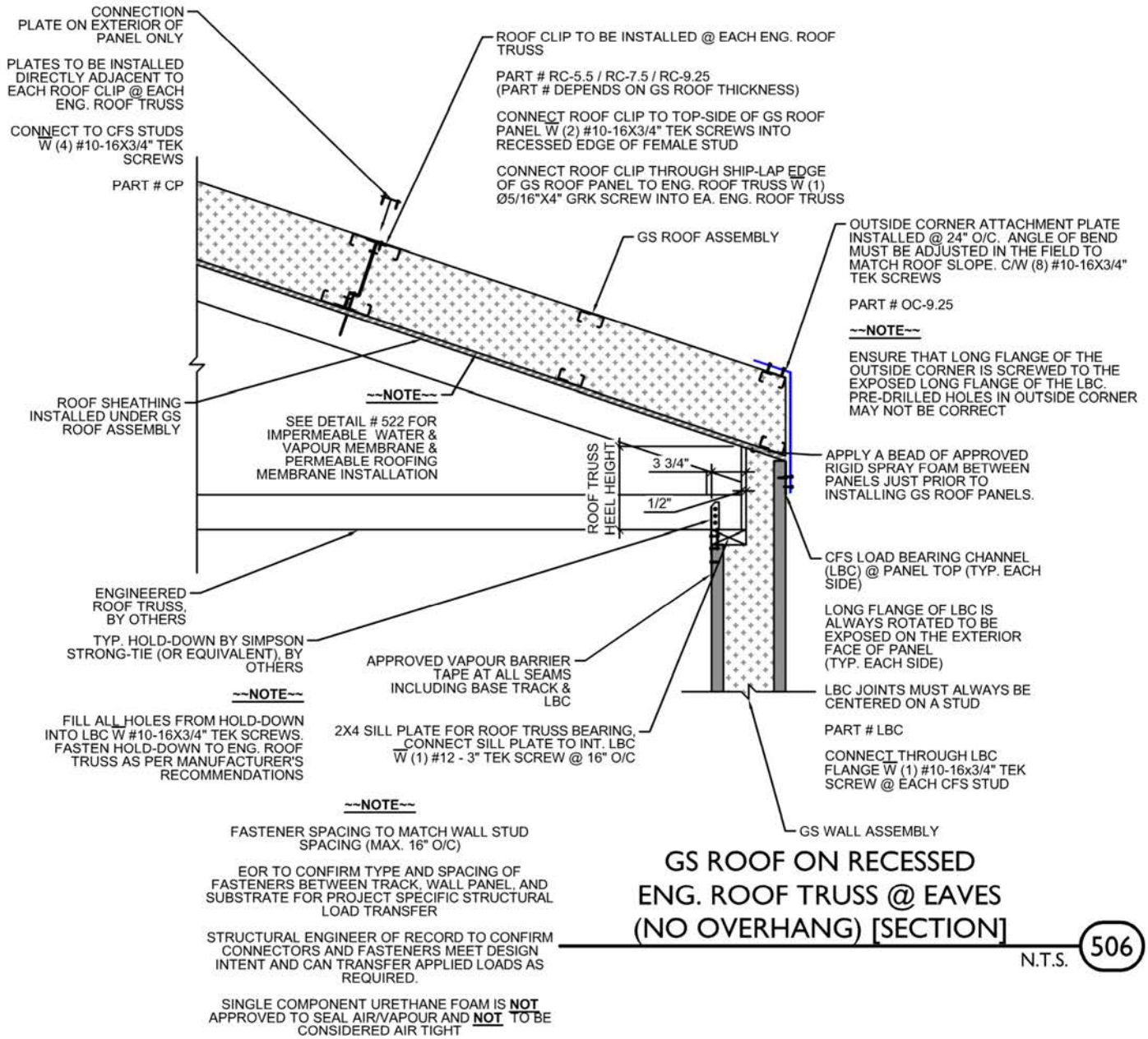
FLOOR LEDGE (BOTTOM CHORD BEARING) [SECTION]

N.T.S. 430

~~NOTE~~

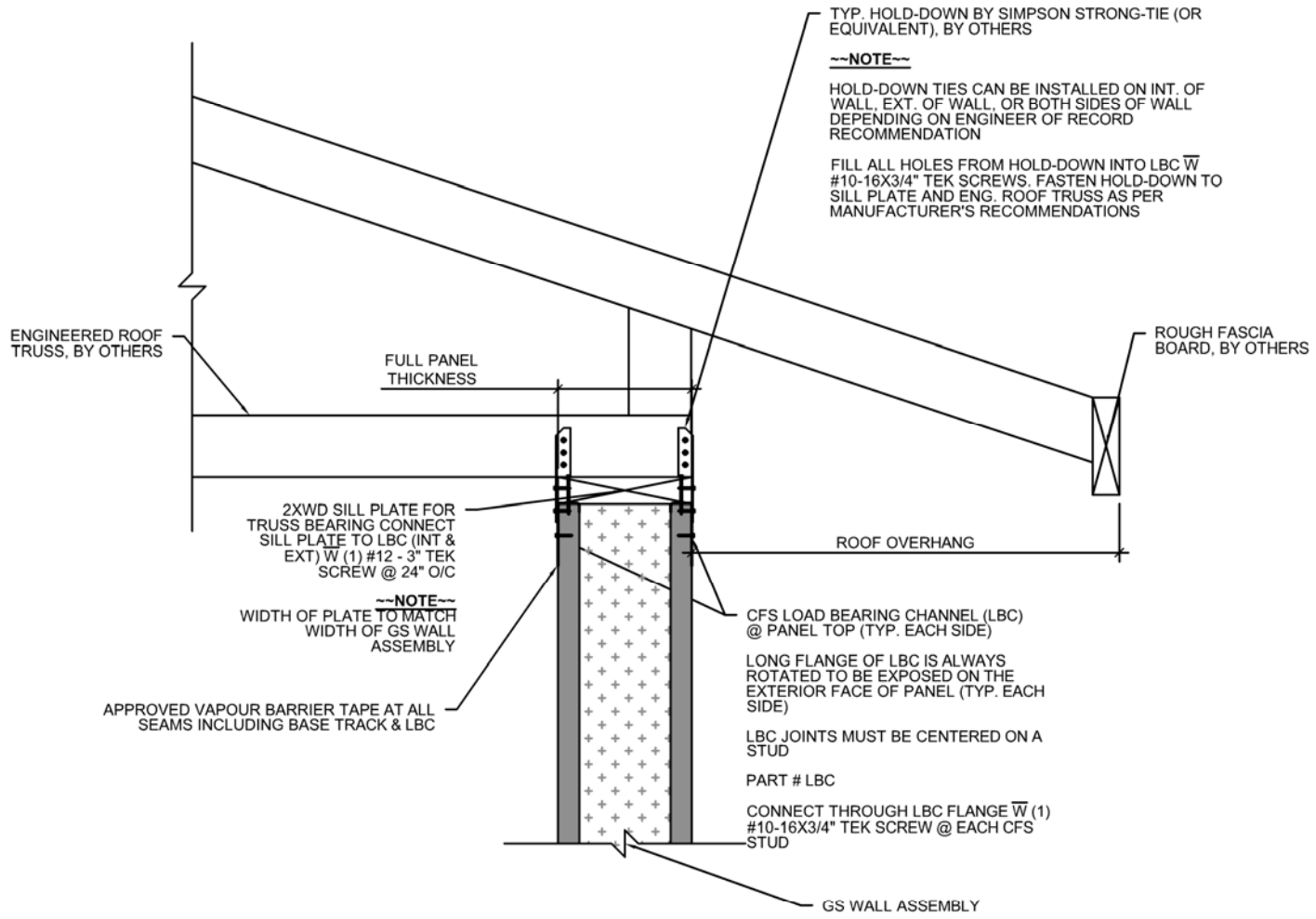
FASTENER SPACING TO MATCH WALL STUD SPACING (MAX. 16" O/C)

EOR TO CONFIRM TYPE AND SPACING OF FASTENERS BETWEEN TRACK, WALL PANEL, AND SUBSTRATE FOR PROJECT SPECIFIC STRUCTURAL LOAD TRANSFER



GS ROOF ON RECESSED ENG. ROOF TRUSS @ EAVES (NO OVERHANG) [SECTION]

N.T.S. 506



FULL BEARING ROOF W SILL PLATE (SECTION)

N.T.S. 508

~~NOTE~~

FASTENER SPACING TO MATCH WALL STUD SPACING (MAX. 16" O/C)

EOR TO CONFIRM TYPE AND SPACING OF FASTENERS BETWEEN TRACK, WALL PANEL, AND SUBSTRATE FOR PROJECT SPECIFIC STRUCTURAL LOAD TRANSFER

STRUCTURAL ENGINEER OF RECORD TO CONFIRM CONNECTORS AND FASTENERS MEET DESIGN INTENT AND CAN TRANSFER APPLIED LOADS AS REQUIRED.

SINGLE COMPONENT URETHANE FOAM IS **NOT** APPROVED TO SEAL AIR/VAPOUR AND **NOT** TO BE CONSIDERED AIR TIGHT