Walls

***General Description*:** The design parameters allowed for steel studs to be placed at either 16 in. or 24 in. on center. It was found that 24 in. on center was more economical, as it utilized the increased strength available with steel and it allowed for an economical stud alignment bearing transfer from roof trusses above.

Alignment of studs and trusses: Alignment of trusses directly over the bearing studs, allows use of a single track or bearing plate element (see Figure B-0). Without alignment the truss bearing point could conceivably land on the top of wall track between the studs. This top of wall track would be required to transfer, or distribute, the load to each of the two adjacent bearing studs. It would not be economical to attempt to increase the track thickness to carry the truss load. Alternate distributor systems are possible as shown in Figure B-0, but again, it was determined that alignment was the more economical solution as it alleviates the need for a top of wall distribution plate system. However, if it becomes critical to the manufacturers to keep the stud spacing at 16 in. on center, there are other possible solutions. A continuous L-header, stronger track, or a nested stud in a deep leg track are some examples as indicated in Figure B-0.

Exterior (Side) Bearing Walls 350S162-27 (33 ksi): The exterior bearing walls are the longer direction walls and are termed the "side walls". They are required to be 3½ in. deep studs and spaced at 24 on center per previous spacing discussions. The plate height is only 7'-6" and the Zone I wind loading is a minimal 15 psf. An economical standard stud section was investigated based on 350S162-27 studs placed at 24 in. on center (33 ksi). The design for this element was found to be at 93 percent of its capacity, if no duration of wind load is considered, thus indicating a very economical design. However, with duration of wind allowed per the HUD Code, the stud is at 70 percent of its capacity indicating that an even more economical stud my be developed. Attempting a more economical stud using the same conditions except a smaller flange width of 1¼ in. in lieu of 1⅝ in. flange was investigated and found to be 13 percent overstressed. It was possible to switch to a higher strength material, say 50 ksi, and thus reduce the required flange width to 1¼ in. but this was unacceptable. The manufacturers indicated a desire for at least 1½ in. of fastening surface width. Therefore the 350S162-27 studs at 24 in. on center were deemed the most cost effective stud available by current industry standards.

Exterior (End) Walls 350S162-27 (33 ksi): The exterior "end walls" are not carrying significant bearing loads, but carry a small tributary of roof loading in combination with the wind loading (see Figure B-0). They are however taller studs as they vary from 7'-6" to 9'-2" in plate height and are required to be 3½ in. deep walls and spaced at 24 in. on center per previous spacing discussions. The taller of the plate height studs were found to be 4 percent overstressed, if no duration of wind load is considered, thus indicating a very economical design. However, with duration of wind allowed per the HUD Code, the stud is at 78 percent of its capacity indicating that an even more economical stud may be developed per the discussion above for the "side walls". The design team felt that the end wall studs should be the same stud as the side wall studs for plant production purposes.

Mating Walls 250S162-27 (33 ksi): Mating wall studs have a 9'-5" plate height and are 2½ in. deep. For the installed condition, two (2) of the 2½ in. deep walls will be placed either tight against each other with wall bracing see Figure B-0 or with ⅛ in. sheathing board on each mating face (see Figure B-0). Note that the minimum of 4'-0" of ⅛ in. sheathing board may be placed high on one wall and low on the other to allow for only a ⅛ in. gap between the studs or an alternate arrangement leaving a ¼ in. gap between the studs (see Figure B-0). This sheathing is required to brace the studs for lateral torsional buckling. The design of this stud found that the 250S162-27 (33 ksi) is at 98 percent of its capacity, if duration of load is considered, thus indicating a very economical design.

Details of other wall connections are shown in Figure B-0 through Figure B-2.

Figure B-0 Mating wall to floor joist

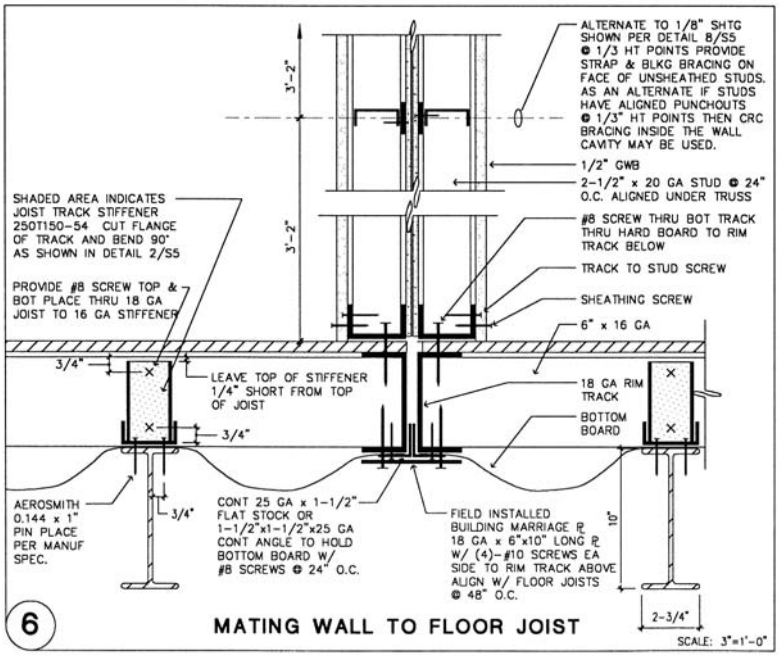


Figure B-0 Truss bearing at exterior wall

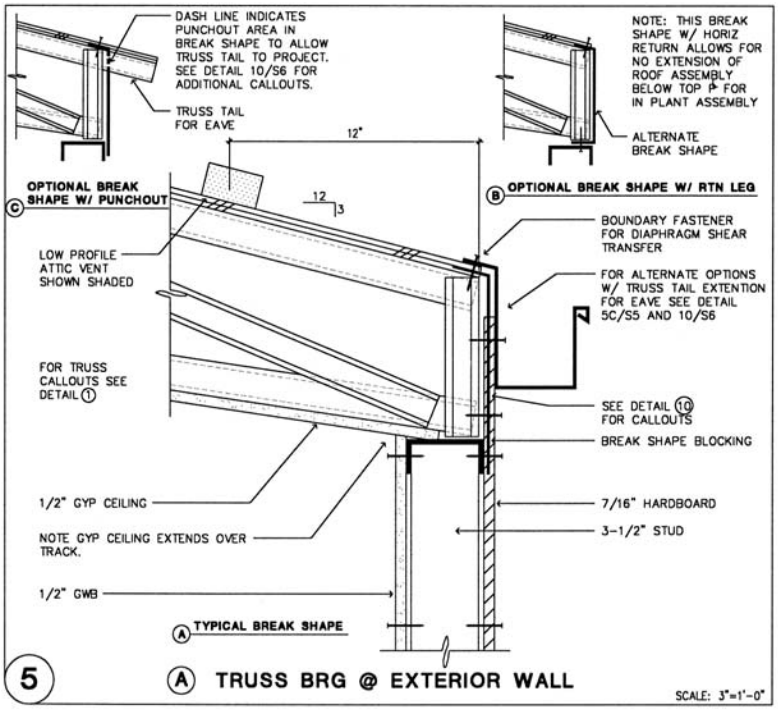


Figure B-0 Alternate distributor top of wall details for stud

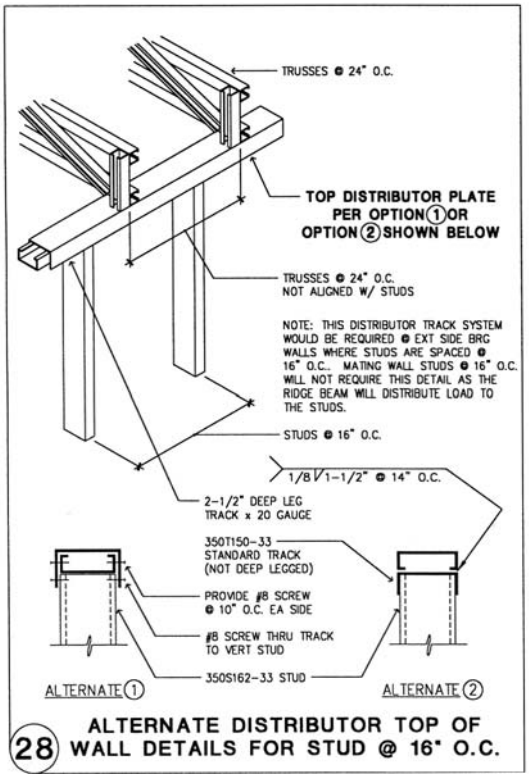


Figure B-0 End wall section

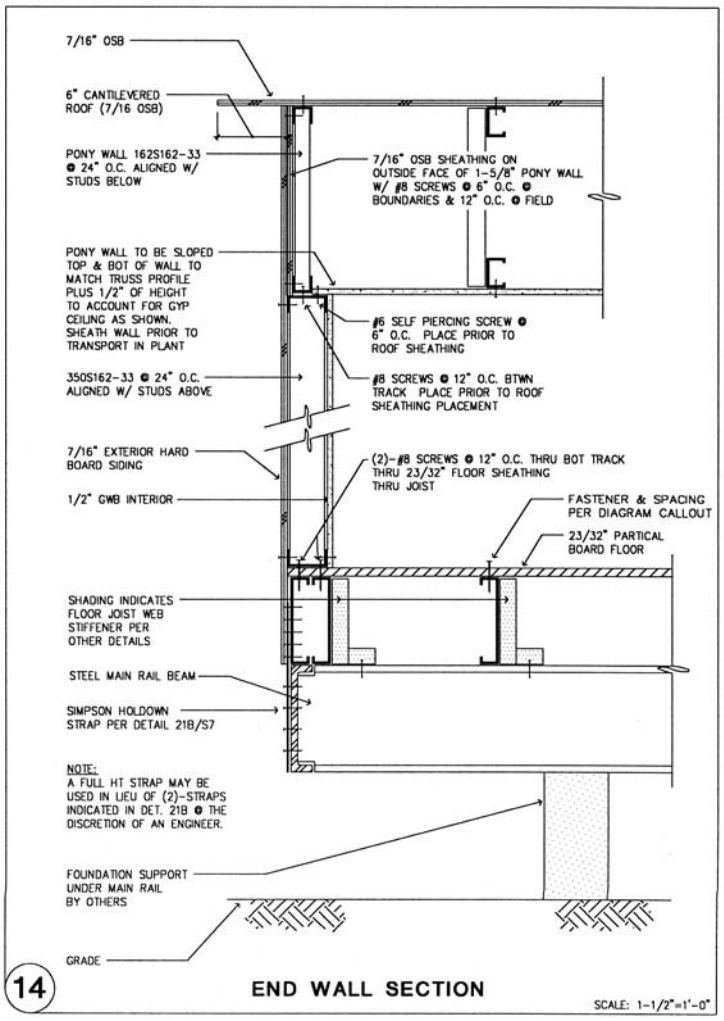


Figure B-0 Wall bracing

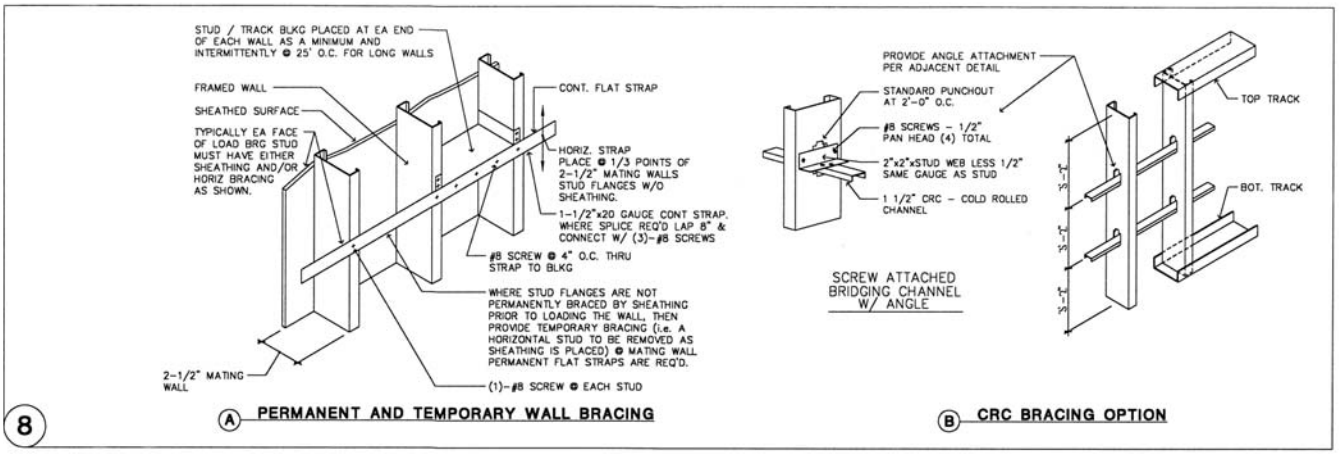
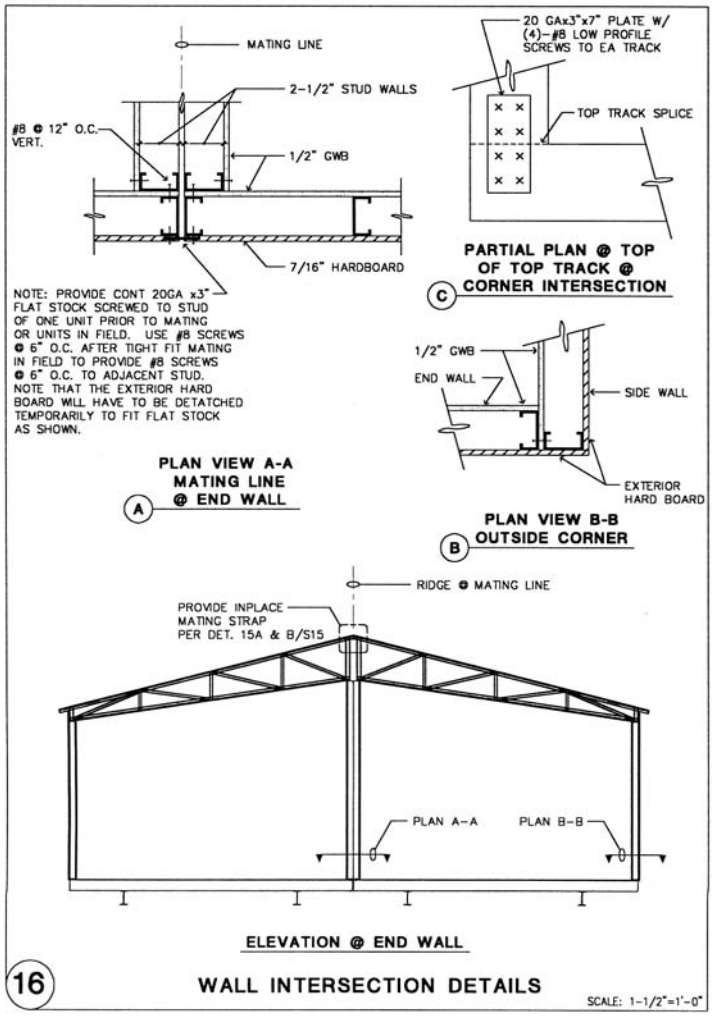


Figure B-0 Wall intersection details



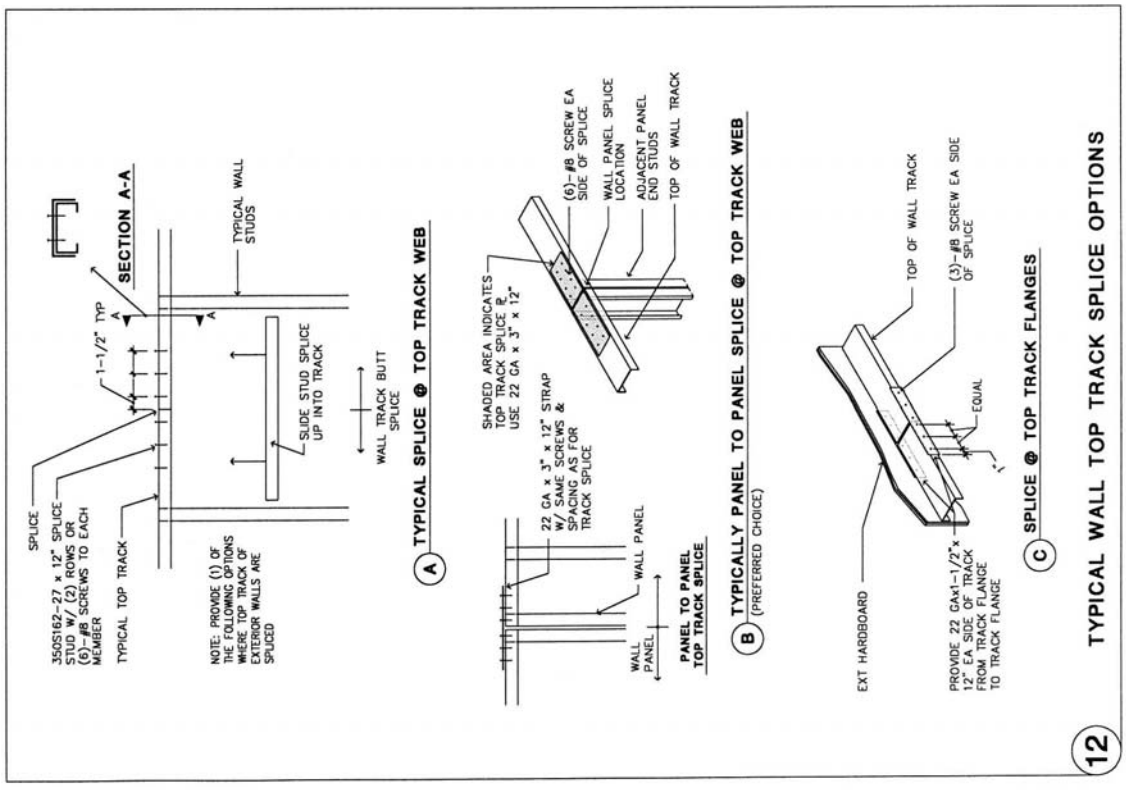


Figure B-1 Typical wall top track splice options

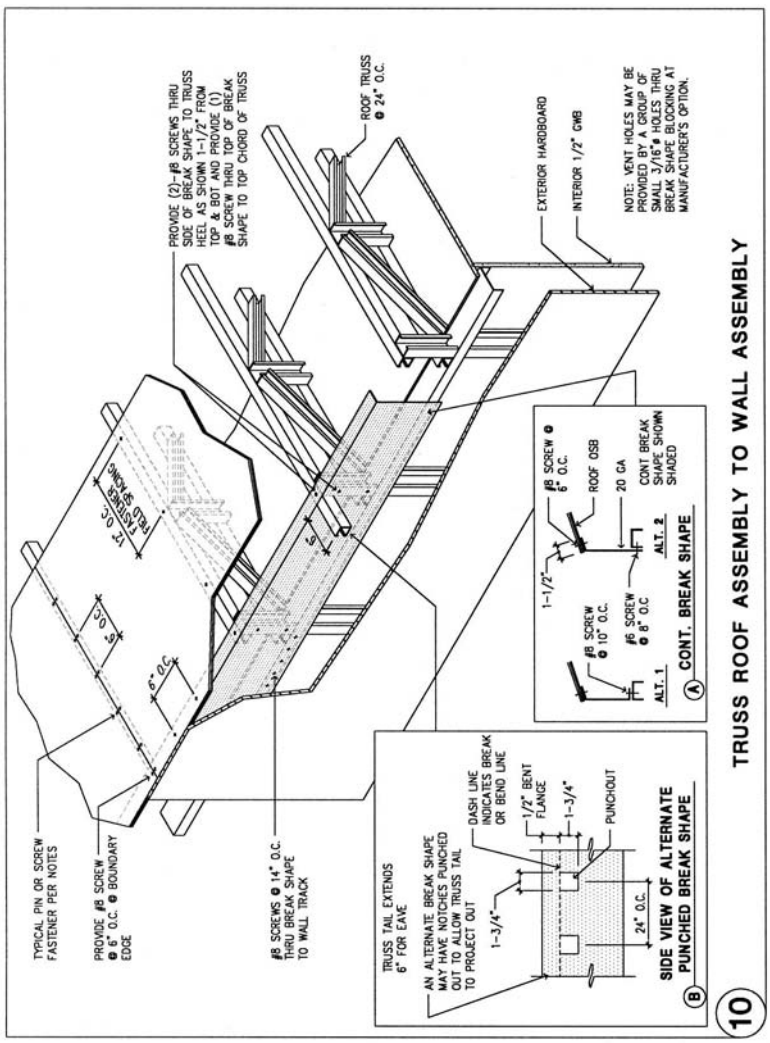


Figure B-2 Truss roof assembly to wall assembly

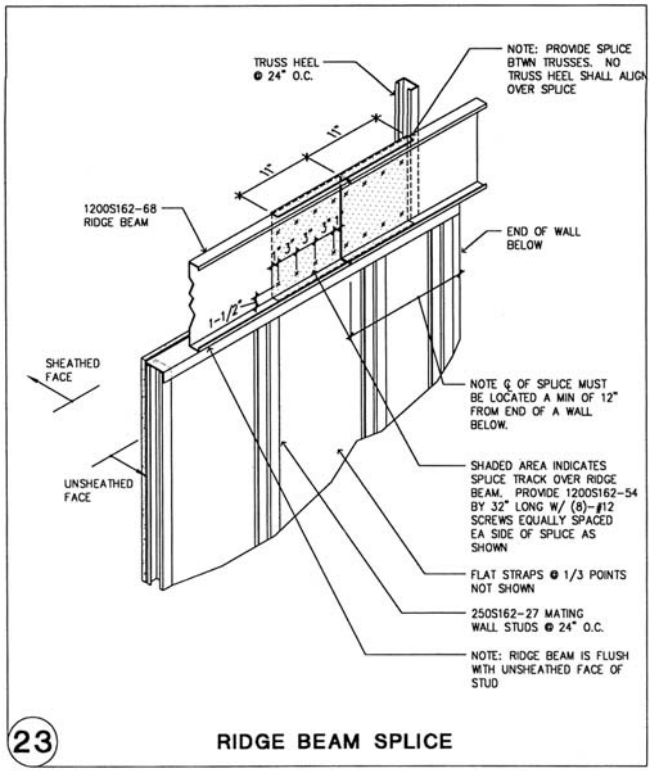
Ridge Beams and Headers

General Description: Following the current plant production practice a ridge beam solution was pursued that imitates the typical timber plywood beam designs. The ridge beam design uses a standard "C" shaped stud section, because the loads and span are large enough to require stronger sections (see Figure B-0 and Figure B-2 for ridge beam details). Note that two alternatives are indicated for the bearing of the ridge beam. Figure B-0 shows how the ridge beam bears directly on the top track and Figure B-0 indicates that it is spaced up to allow the gypsum ceiling board to extend in over the bottom of beams at beam span locations.

L-Headers: At exterior walls, window and door openings, the loads and spans are smaller than at the ridge location, and an "L"-Header element is used to span the opening. "L"-headers are "L" shaped sections that are placed over the top of wall track and cripple studs to act as a beam. There is an approved "L" header design guide that is used for the basis of this design (see Figure B-2 and Figure B-2).

Note that these calculations propose that single L-Headers would carry the design loads, however, the only current accepted design guide for L-Headers is for double L-Header conditions. Some proprietary testing has indicated that a single L-Header framed down to the head track might give promising results. 20 gauge or even 22 gauge headers may work for the current design load conditions. They must be tested as indicated in the details.

Figure B-2 Ridge beam splice



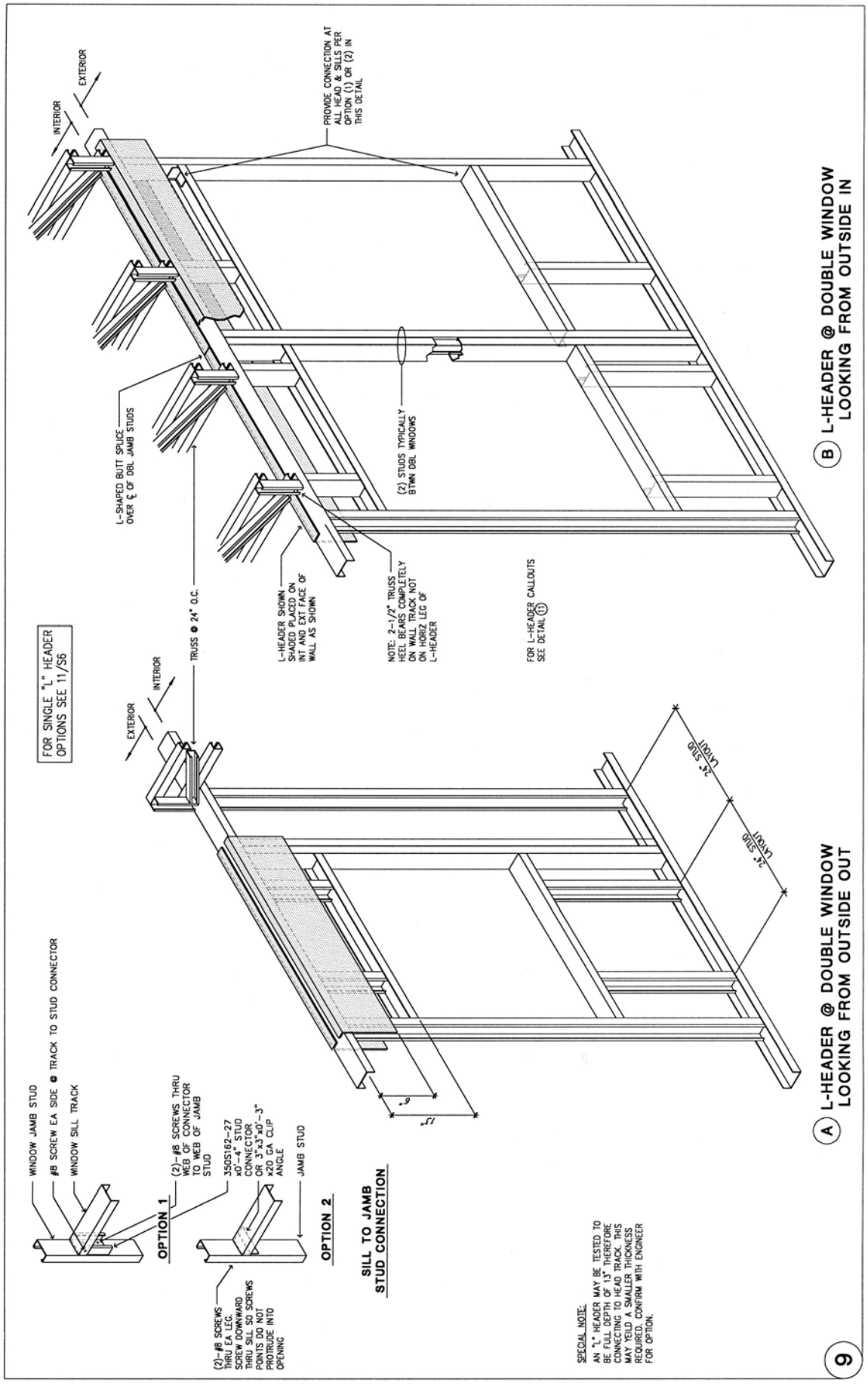
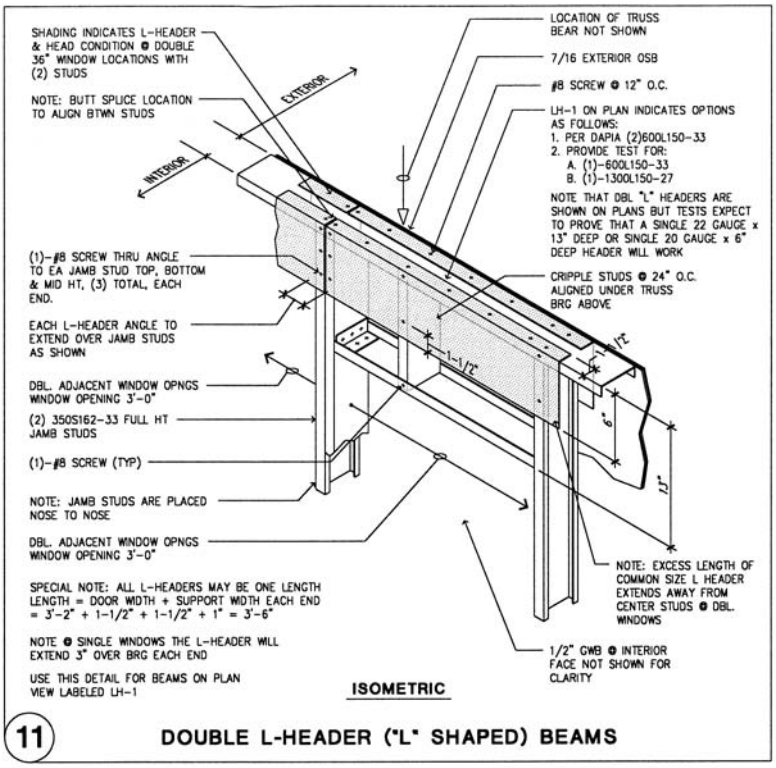


Figure B-2 L-Headers at double window

Figure B-2 Double L-Header ("L" shaped) beams



Shearwalls

General Description: The lateral system utilizes the current gypsum shearwall tables as found in the UBC 1997 and the IBC 2000. For typical hold downs and shearwall sheathing components (see Figure B-2 and Figure B-2).

The prototype design utilizes economical 350S162-27 studs at 24 in. on center. From a value engineering standpoint, the 27 mil or 22 gauge studs are acceptable. However, 20 gauge studs are required in order to use current shear wall values in the 1997 Uniform Building Code (UBC). This is the only approved code or testing source available for shearwall assemblies utilizing cold-formed studs. The International Building Code (IBC) 2000 has identical information as found in the 1997 edition of the code. If tested, the new shearwall assemblies using 22 gauge studs would be expected to perform to similar load capacities as the current timber shearwall being use by the manufactured home industry. It would also be expected that testing would allow much more cost effective fastener spacing of say 6/12 in. meaning 6 in. at boundaries and 12 in. in the field, instead of the current 4/4 in. and 7/7 in. code assemblies.

These calculations were extrapolated to the given UBC double-sided gypsum wallboard by using one-half of the value for single side gypsum wallboard. A HUD-prescribed factor of safety of 2.5 was used on the UBC ultimate loads in lieu of the 3.0 factor of safety listed in the current 1997 UBC. This follows with the revision found in the new IBC 2000 using a 2.5 factor of safety. The prototype uses ½ in. gypsum wallboard on the interior face of the exterior wall studs for shearwall strength. There are two wall assemblies available with the ½ in. gypsum wallboard, one at 7/7-fastener spacing and one at 4/4-fastener spacing. This design uses the 4/4 on the end walls and the 7/7 on the sidewalls. Minimum lengths of wall required at those capacities are shown on the plans. Simpson CS18 straps for the typical jamb and 48 in. on center strap spacing are used to carry typical hold down loads. The same strap with additional screws is used for the increased hold down requirement at the side shearwalls. These details appear to be cost effective as compared to current timber framed practice.

The prototype design indicates that the typical studs are 22 gauge (27 mil). At locations where shearwalls are indicated on the plan then they must be 20 gauge (33 mil) unless a tested assembly is provided to confirm 22 gauge (27 mil) studs are adequate. Note that the plans indicate all shearwalls are based on code allowable values using 20 gauge studs. Typically, exterior studs are 22 gauge for gravity and out of plane bending design. Until these allowable load requirements are proven by testing for 22 gauge studs, the design will use 20 gauge studs.

Figure B-2 Typical wall to floor strap

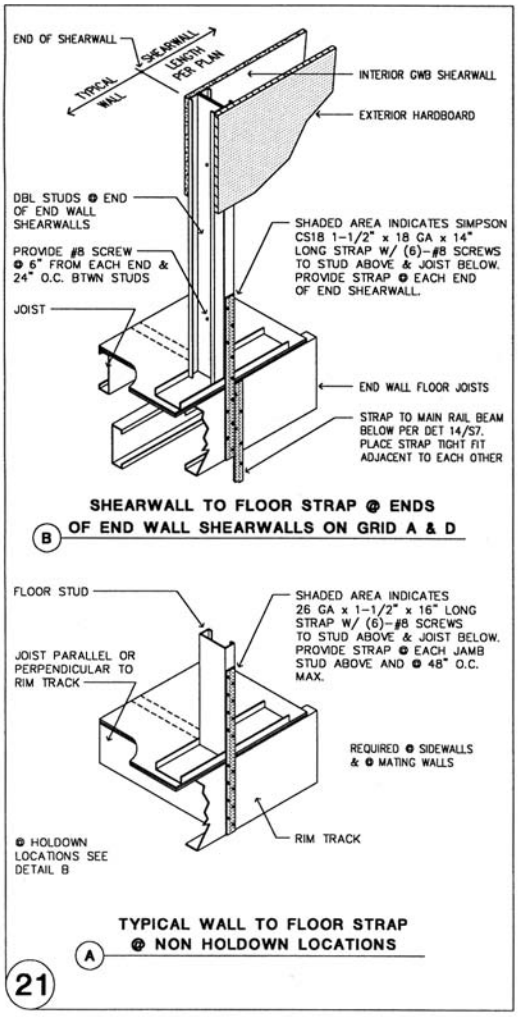
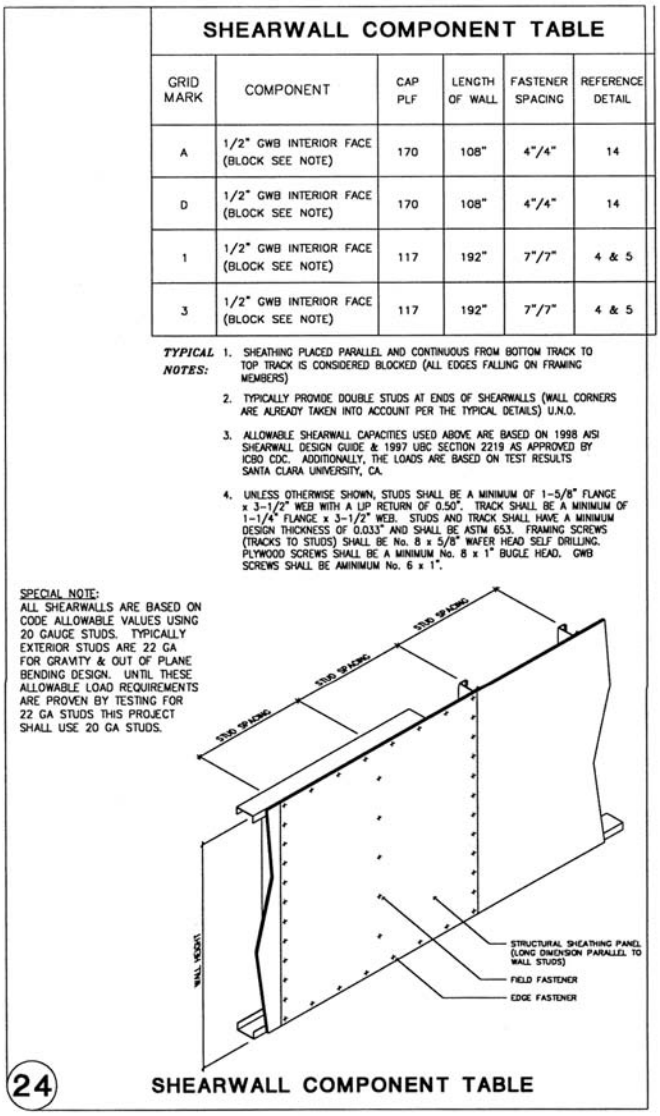


Figure B-2 Shearwall component table



Floor Joist and Chassis Systems

General Description: The plans indicated that 600S162-43 joists at 24 in. on center are acceptable given that the chassis frame has outriggers at 8'-0" on center The design investigated using both 8 in. and 6 in. deep floor joists at varying gauges. It was felt that the 6 in. deep 18 gauge joist at 24 in. on center would be most economical. The joist may be punched or un-punched. (See Figure B-0, Figure B-2, Figure B-2, Figure B-2, Figure B-2 and Figure B-2 for typical floor construction details.)

Fasteners used to attach the floor sheathing may be screws and or pneumatic pins per details and the framing note #9 from the Framing and Construction Notes. Note that adhesive is used in addition to the fasteners between the floor joist and the sheathing.

Note that an additional 24 in. long joist section is required at each joist framing over the outriggers as shown in Figure B-2 and Figure B-2. A two-dimensional joist load sharing analysis approach indicated that the single joists over the outriggers were overstressed in combined bending and shear at the point that they cantilever over the outrigger. However, with the added 24 in. long section of joist to the design was found code acceptable.

The floor joist design assumes that a chassis frame assembly will be used that has outriggers spaced at no more than 8'-0" on center. These outrigger elements are a requirement for this prototype. Floor joist blocking is economically detailed to require only 3 blocks within the 56'-0" run of joist (see Figure B-2).

The chassis assembly design is not included as part of the prototype design. The plans indicate that the chassis design (main rail, outrigger, cross bracing, and connections) will be designed by others. Note that at the outrigger locations at 8'-0" on center the aligned floor joist will need to be incorporated into the frame design and shall be design confirmed at that time. It is possible that a heavier gauge joist will be required.

Additional Concluding Design Comments:

Economical framing elements: The truss elements have room for further cost reductions through the use of alternate section shapes and material steel strengths. The exterior "side and end" wall studs are for the most part economically designed for their load conditions. However they could be redesigned to use less area of steel by marginally reducing the flange or lip lengths and by increasing the material strengths. This is not possible with current standard shapes available, but is possible by special order.

Specialized Roll-forming for Manufactured Housing: Once the manufacturing industry begins using cold-formed materials the cost of producing specialized sections, even proprietary to each production plant is enormous. Plants would eventually have roll-forming capabilities within their own facilities**.**

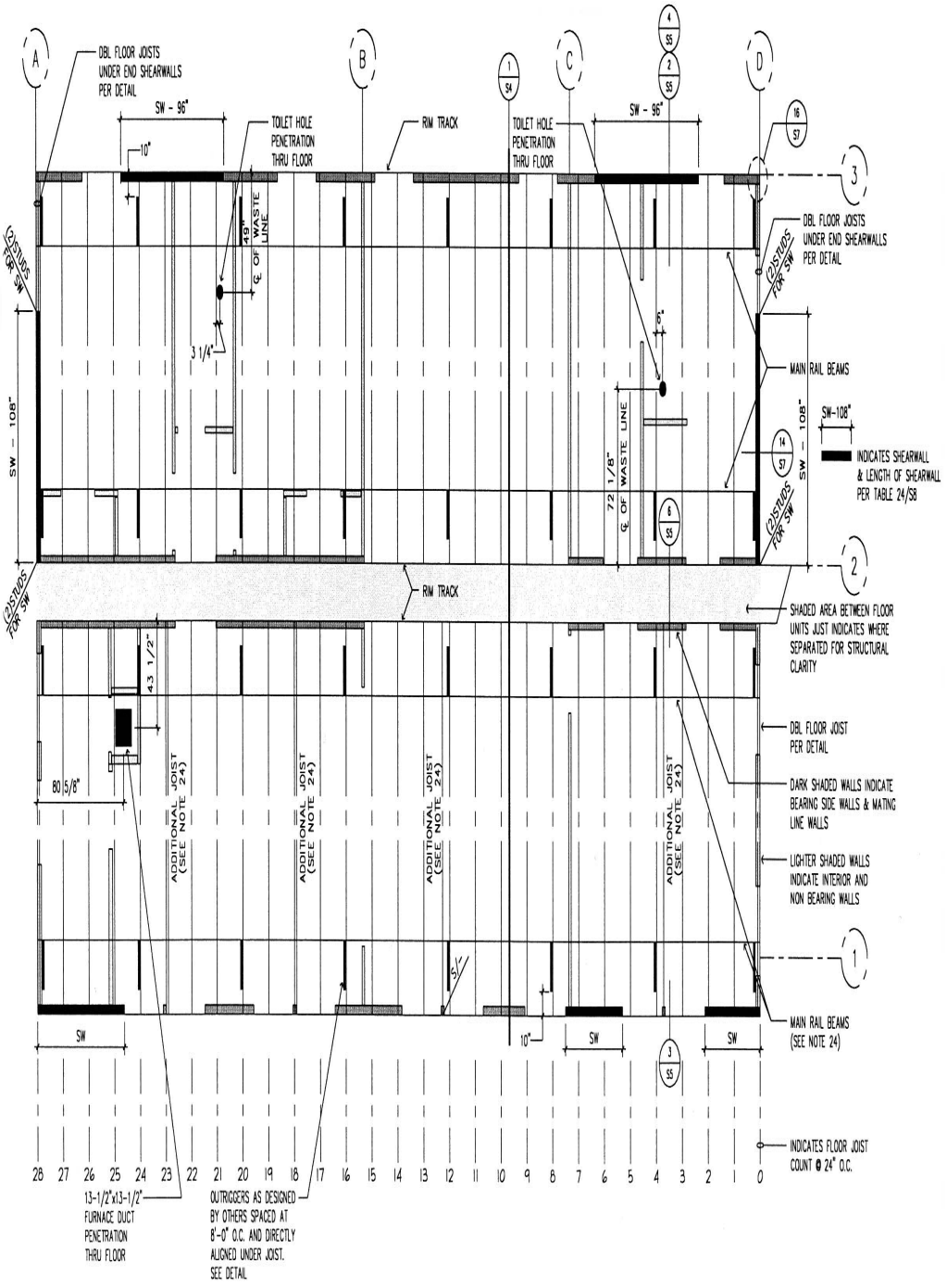


Figure B-2 Floor framing plan

Figure B-2 Additional joist at window jamb studs and additional blocking at outrigger

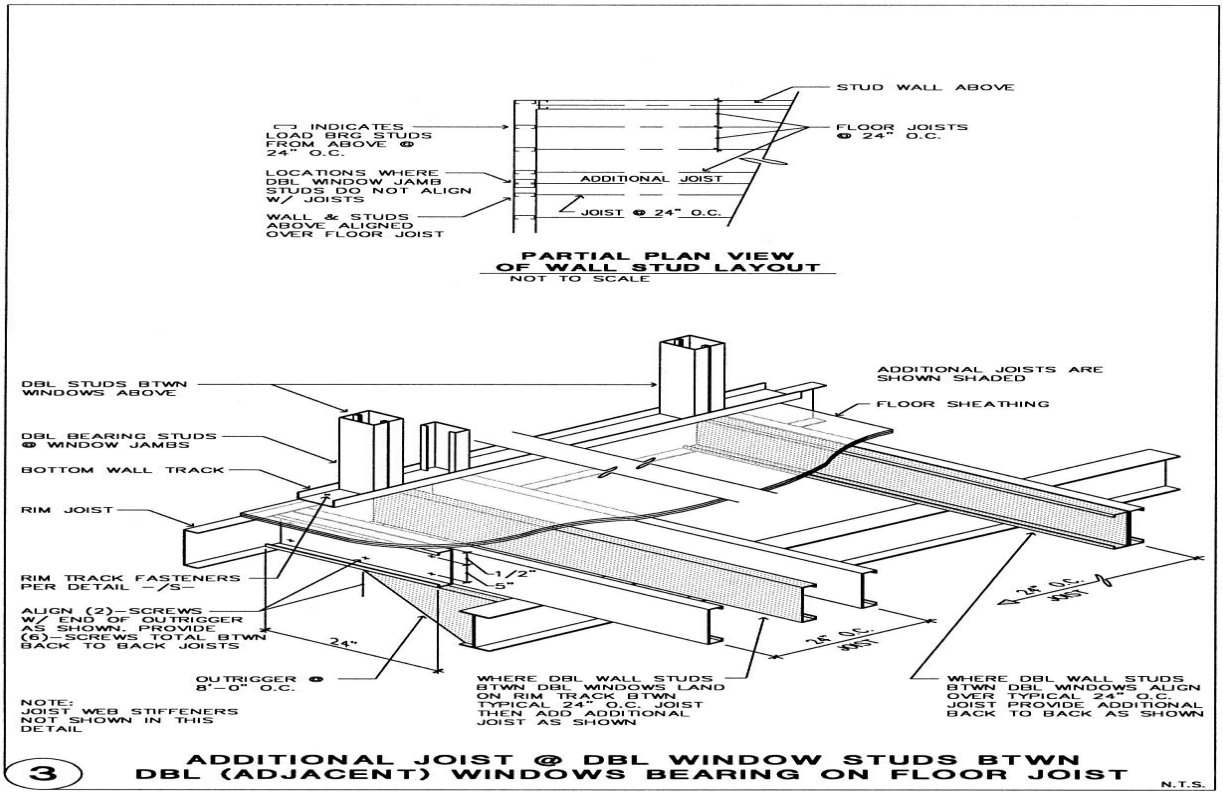


Figure B-2 Isometric floor to wall connection

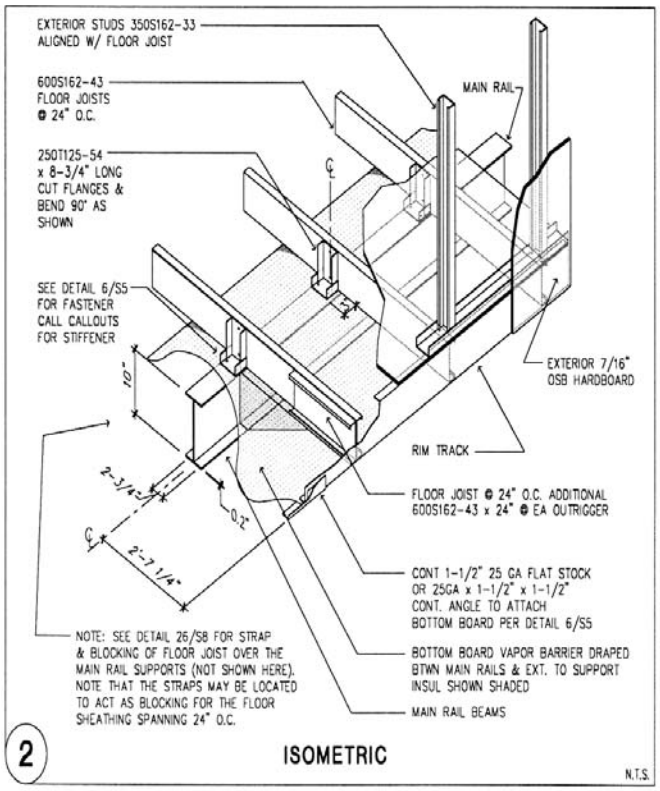


Figure B-2 Exterior wall to floor joist connection

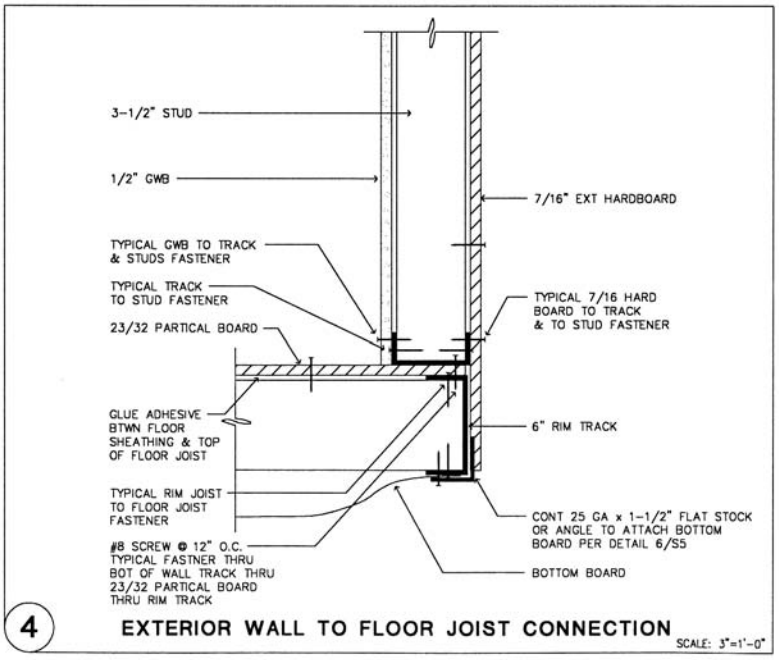
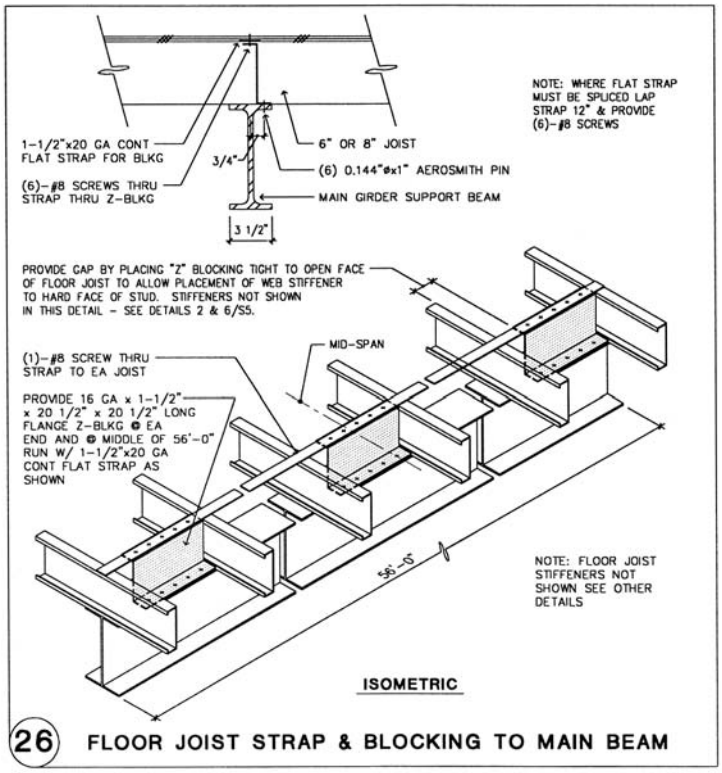


Figure B-2 Floor joist strap and blocking to main beam



Miscellaneous Construction Information

The following pages contain additional notes and details that were developed as part of the structural design (see Figure B-2, Figure B-2, and Figure B-3).

Figure B-2 General structural notes

GENERAL NOTES

1.0 CODES

ALL METHODS, MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE REQUIREMENTS OF THE HUD PART 3280 MANUFACTURED HOME CONSTRUCTION AND SAFETY STANDARDS AND INTERPRETATIVE BULLETINS TO THE STANDARDS; A.I.S.I 1996 EDITION; AND A.I.S.C. 9TH EDITION.

1.2 DESIGN CRITERIA

A. VERTICAL LOADS: SELF-WEIGHT OF WALLS

Roof Live Load	20 PSF	Roof Dead Load	10 PSF
Floor Live Load	40 PSF	Floor Dead Load	10 PSF

B. LATERAL LOADS:
ALLOW 33-1/3% INCREASE IN STRESSES FOR WIND FORCES. LATERAL FORCES IN THE METAL STUD ARE TRANSFERRED THROUGH THE STUDS AND CONNECTIONS TO THE SUPER-STRUCTURE AS DETAILED WHERE THE LOADS ARE ULTIMATELY DISSIPATED.

Wind Criteria

Wind Lateral	15 PSF
Wind Uplift	9 PSF (net)
Wind Uplift at overhangs	22.5 PSF
Seismic Zone	Not applicable
by current HUD Deflection limits	L/240 FLOORS L/180 ROOF CEILING & WALL PARTITIONS

2.0 LIGHT GAUGE STEEL

MATERIALS QUALITY ASSURANCE: MILL CERTIFICATION OR TENSILE TESTS AND GALVANIZATION TESTS SHALL BE PROVIDED FOR THE LIGHT GAUGE STEEL TO CONFIRM THE FOLLOWING MATERIAL PROPERTIES.

A. MATERIAL SHALL BE FORMED FROM GALVANIZED ASTM A653, GRADE D STEEL FOR 97 MIL (12 GA), 68 MIL (14 GA), AND 54 MIL (16 GA) MATERIALS WITH A MINIMUM YIELD OF 50 KSI AND ASTM A653, GRADE A FOR 43 MIL (18 GA) GAUGE AND LIGHTER WITH A MINIMUM YIELD OF 33 KSI. ALL MEMBERS SHALL BE GALVANIZED PER ASTM A924 WITH MINIMUM COATING REQUIREMENTS AS FOLLOWS:

NON-LOAD BEARING STUDS	PER ASTM C654 - G40 COATING
LOAD BEARING STUDS	PER ASTM C955 - G60 COATING
EXPOSED EXTERIOR STUDS	PER ASTM C955 - G90 COATING

B. ALL MEMBERS SHALL HAVE THE MINIMUM EFFECTIVE PHYSICAL AND STRUCTURAL PROPERTIES AS INDICATED BELOW AS MANUFACTURED BY A MEMBER OF THE STEEL STUD MANUFACUTURES ASSOCIATION, PER ICBO REPORT ER #4943 DATED DECEMBER 1993, OR EQUIVALENT AT THE MANUFACTURERS OPTION AND APPROVED BY DAPIA:

THICKNESS OF STEEL COMPONENTS		
MINIMUM THICKNESS (MILS)	DESIGN THICKNESS (IN)	GAUGE
18	.0188	25
27	.0283	22
33	.0346	20
43	.0451	18
54	.0566	16
68	.0713	14
97	.1017	12

ACCESSORIES SHALL BE OF THE TYPE, SIZE, AND SPACING SHOWN ON THE DRAWINGS OF A MINIMUM 68 MIL (14 GA) MATERIAL UNLESS OTHERWISE SPECIFIED.

ALL STRUCTURAL MEMBERS SHALL BE DESIGNED IN ACCORDANCE WITH THE AMERICAN IRON AND STEEL INSTITUTE (AISI) "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS", 1996 EDITION. PREFABRICATED PANELS SHALL BE SQUARE, WITH COMPONENTS ATTACHED IN A MANNER AS TO PREVENT RACKING AND TO MINIMIZE DISTORTION WHILE LIFTING. FASTENING OF COMPONENTS SHALL BE BY WELDING OR SCREWING OR BY OTHER MEANS OF FASTENING AS INDICATED ON THE DRAWINGS. WELDS SHALL BE OF SUFFICIENT SIZE TO INSURE THE STRENGTH OF THE CONNECTION (MIN. 1/8" WELD BY 1" LENGTH). WIRE TYING OF COMPONENTS SHALL NOT BE PERMITTED. ALL WELDS SHALL BE TOUCHED UP WITH ZINC-RICH PAINT. STUDS SHALL BE PLUMBED, ALIGNED AND SECURELY ATTACHED TO FLANGES OF BOTH UPPER AND LOWER TRACK RUNNERS. FRAMING OF WALL OPENINGS SHALL INCLUDE HEADERS AND SUPPORTING STUDS AS SHOWN ON THE DRAWINGS.

CONTINUED GENERAL NOTES

C. ALL SCREWS SHALL BE SELF TAPPING SELF DRILLING FASTENERS WHICH ARE ZINC COATED AS MANUFACTURED BY COMPASS INTERNATIONAL PER ICBO REPORT ER-5202 OR APPROVE EQUAL (ITW BUILDEX TEK / TRAXX, ELCO DRIL-FLEX, HILTI). THE MINIMUM SCREW SIZE /TYPE / POINT SHALL BE #8-18 (#2 POINT) SCREW OR #10-16 (#2 POINT) SCREW FOR USE IN 33 MIL (20 GA) THRU 54 MIL (16 GA), AND #10-16 (#3 POINT) OR #12-14 (#2 OR #3 POINT) SCREW FOR HEAVIER THAN 54 MIL (16 GA) UNLESS NOTED OTHERWISE. SCREWS FOR SHEATHING CONNECTIONS SHALL BE OF THE PROPER SIZE AND TYPE FOR A POSITIVE SHEATHING TO METAL CONNECTION. ALL SCREW CONNECTIONS SHALL BE MADE FROM THE LIGHTER MATERIAL INTO THE HEAVIER MATERIAL UNLESS NOTED OTHERWISE. SCREWS SHALL HAVE A MINIMUM PROJECTION OF 3 THREADS THROUGH THE LAST MATERIAL JOINED AND SHALL HAVE MINIMUM EDGE DISTANCES AND CENTER TO CENTER SPACINGS OF 1/2". ALL SCREWS SHALL CONFORM TO SAE J78. ALL SCREW CAPACITIES SHALL BE AS INDICATED BELOW AND SHALL BE VERIFIED BY THE MANUFACTURER PRIOR TO CONSTRUCTION. THE MANUFACTURER SHALL PROVIDE SCREW TEST DATA FROM THE SCREW MANUFACTURER?S QUALITY ASSURANCE PROGRAM OR SHALL RETAIN AN INDEPENDENT CERTIFIED TESTING AGENCY TO PROMOE THE LOAD TEST VERIFICATION. IN CORROSIVE ENVIRONMENTS SCREWS SHALL BE COATED WITH A CORROSIVE RESISTANT COATING AND THE SCREW MANUFACTURER SHALL PROVIDE VERIFICATION OF THE FASTENERS RESISTANCE TO HYDROGEN EMBRITTLEMENT.

LOADS PER COMPASS INTERNATIONAL ICBO 5202

SCREW	LOADS TO BE VERIFIED (POUNDS)							
	33 MIL (20 GA)		43 MIL (18 GA)		54 MIL (16 GA)		68 MIL (14 GA)	
	SHEAR	PULLOUT	SHEAR	PULLOUT	SHEAR	PULLOUT	SHEAR	PULLOUT
#8	222	93	330	143	458	302	533	352
#10	225	84	344	155	629	230	624	337
#12	232	123	326	192	622	294	829	379

D. PNEUMATIC PINS: PNEUMATIC PINS FOR ATTACHING LIGHT GAUGE TO STEEL MAIN RAIL BEAMS SHALL BE 0.144 DIAMETER x 1" LONG PINS (ATTACHMENT TO A MAXIMUM OF 3/16" THICK STEEL MATERIAL). MANUFACTURED BY AEROSMITH OR APPROVED EQUAL. ATTACHMENT OF SHEATHING MATERIALS TO LIGHT GAUGE STEEL SHALL BE MADE WITH AEROSMITH 0.100 x 1-1/4" PINS OR APPROVED EQUAL. ALL PIN ATTACHMENT SHALL BE PER AEROSMITH ICBO NER-407.

E. ALL MATERIALS SHALL BE STORED DRY AND SHALL BE KEPT FREE OF CORROSION. DAMAGED MATERIALS WILL NOT BE ACCEPTABLE.

ROOF DIAPHRAGM: 7/16" OSB (PANEL INDEX = 24/16), WITH 8d NAILS OR .131" DIA P-NAILS AT 6" O.C. AT SUPPORTED PANEL EDGES AND AT 12" O.C. AT FIELD TYPICAL UNLESS NOTED OTHERWISE ON PLAN. WHERE REQUIRED, USE PLY-CLIPS INSTALLED PER MANUFACTURER'S GUIDELINES. USE PLY-CLIPS INSTALLED PER MANUFACTURER'S GUIDELINES ONLY IF SPAN RATING IS LESS THAN 24/16.

FRAMING / CONSTRUCTION NOTES

1. Bearing Walls: are typically shown shaded on the plans and sized as follows.
   Exterior side walls: shall be 350S162-27 studs at 24" o/c.
   Interior mating walls: shall be 250S162-27 studs at 24" o/c.

   Note: Typically all studs, joist, and track are called out per the SSMA stud Designator system. For example a 350S162-27 indicates a "350" = 3-1/2" deep web, "S" = stud, "162" = 1.625" flanges, "27"= 22 gauge base metal thickness (0.283 for design). The same designators are used for Track except a "T" instead of an "S" is indicated.
   Alternate stud spacing: see detail 28/s8 for an alternate stud framing @ 16" o.c. in lieu of 24" o/c.
2. Nonbearing walls:
   End walls: shall be 350S162-27 studs at 24" o/c.
   End Pony walls: shall be 162S125-27 studs at 24" o/c
   Interior walls: shall be 250S162-18 studs at 24" o/c or at isolated locations --350S162-18 studs at 24" o/c
3. All stud material shall be per SSMA ICBO Report #4943 or per MSMA ICBO #4943. All per detail 25/S8.
4. Bearing Wall Stud Alignments: Typically all roof trusses and floor joist shall be aligned with the bearing wall studs. Alignment shall mean that the web of the stud is located within 3/4" of web of the floor joist and/or the web of the bottom chord of the roof truss, all per detail 19/S7.
5. Bearing Walls shall be sheathed at both flanges prior to the loading of the walls.
6. Floor Joists: shall be 600S162-43 joists at 24" o/c. Floor joist may be punched with standard ICBO punchouts except that no punchout shall occur within 12" of a bearing support location or under a bearing wall from above (i.e. the side walls and mating walls over the cantilevered floor joists). At some locations as indicated on the plans double floor joists are required. Floor joist shall not be penetrated with additional holes without the approval of the Engineer.
7. Rim Track: shall be 600T150-54 typically. (Note that a 1-1/4" flange track is acceptable in lieu of the 1-1/2" flange track specified however the 1-1/2" flanges is specified to aid the framing area of attachments).
8. Roof Trusses: Roof truss top and bottom chords and web members shall be 250S162-27 (per SSMA) with the exception that the vertical high heel end of the truss will be 250S162-54.
9. Horizontal Diaphragm Sheathing:

   Floor Sheathing: 23/32" particle board shall be used for the floor sheathing spanning the 24" o/c joist framing. Attach all floor sheathing with Titebond metal framing construction adhesive/glue by Franklin International (or approved equal) and screws or pneumatic pins per the details. Where pneumatic pins are used in lieu of the screws indicated in the plans then the sheathing shall be attached with Aerosmith 0.100 Diam. x 1" pneumatic pins (or approved equal). Roof Sheathing: 7/16" APA rated OSB shall be used spanning the 24" o/c trusses. Use Aerosmith 0.100 diameter x 1" pneumatic pins per ICBO.
10. Top and bottom Track: shall be 350T150-27 at 3-1/2" walls and 250T150-27 at 2-1/2" walls. (Note that a 1-1/4" flange track is acceptable in lieu of the 1-1/2" flange track specified, however the 1-1/2" flanges is specified to aid the framing area of attachments). No punchouts allowed. 20 gauge track may be desirable at manuf. option for attachment purposes.
11. Track splices: No additional requirements are necessary for bottom of wall track butt splices (except if required in the plant for transport). Top of wall track shall be spliced per detail 12/S6 Note that typically track is continuous under all L-headers.
12. Light gauge steel to main rail beam connections: shall be made with Aerosmith 0.144 diameter x 1" pneumatic pins installed per the manufacturer's specifications. (substitutions are acceptable at the approval of the Engineer).
13. ▬▬ Indicates a shearwall callout per the shearwall table - this sheet. and detail 29/S8.
14. Additional stud Penetrations: See Detail 22/S7 for allowable stud penetrations.
15. Floor and Truss locations are indicated on the plans at 24" o/c.
16. Venting and energy insulation requirements are the responsibility of others (vents are indicated on the plans but shall be confirmed).
17. Non bearing interior walls shall be supported at the top per detail 20/S7.
18. Typical Anchor Straps: At both side walls and at mating walls typically provide Simpson CS18 X 14" long with (3) #8 screws each side of splice - (6) total, from each exterior jamb stud to the floor rim track and at a maximum of 48" o/c. Place strap directly to outside face of stud and rim track below prior to placement of exterior hardboard. All per detail 21/S7.
19. Shearwall Holdown Straps are as indicated in detail 21/S7 at the ends of the end wall shearwalls.
20. Corner studs are connected per detail 16/S7.
21. Screw attachment of all light gauge shall follow the general connection detail 18/S7.
22. LH-1 indicates a "L" - Header or Beam element on the plans per details 9 & 11/S6.
23. See the General Structural Notes sheets for additional notes and specifications not covered in these framing notes.
24. Main Chassis Notes: The main chassis design is not addressed in these plans as it is expected to remain the same as per timber framed designs. Outrigger and main rail designs are by others. Loads to outriggers are indicated in the details 1/S4.
25. Air infiltration & fire stopping @ floor & ceiling marriage lines will be provided by manuf's installation instructions.

Figure B-2 Roof, floor and wall assembly

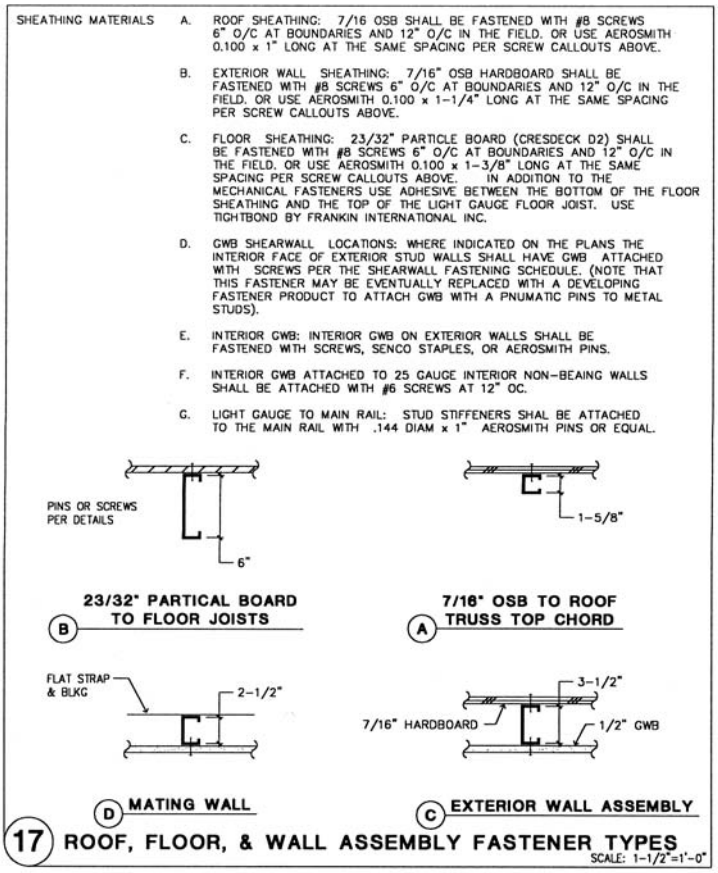


Figure B-3 Allowable field penetrations