



Firm License # P-1869

July 19, 2024,

Project # 22-4006

2659 Hwy 87 S.  
Cameroon, NC 28326

RE: ALTERNATE DESIGN OF PARTITION WALL

To Whom it may Concern,

The engineer was requested for an alternative method to install partition wall at the house located at 2659 2659 Hwy 87 S. Cameroon, NC 28326. This letter will replace the wall bracing detail sheet "A106" signed on 07/03/2024.

The partition wall shall be Head-of-Wall (HOW) composite consisting of 2 layers of 5/8" fire shield gypsum board each side. The gypsum board must be installed up to the height as recommended per Head-of-Wall (HOW) composite construction specifications attached within this letter. The gypsum boards shall be installed in the vertical direction to each stud flange using #6 Type S drywall screws spaced at 12" o.c. including top and bottom tracks. The second layer joints shall be staggered over the first layer.

The steel studs shall be minimum 20gage, 6 inch wide at maximum spacing of 24" o.c. (600PDS125-30mil by ClarkDietrich or approved better). *Please note that the studs shall be spaced at 12" o.c for heights greater than 23'-1"*. Use 20 gage, 2-1/2" leg deflection top track (600PDT250-30 by ClarkDietrich or approved better). See Picture 1 for further wall assembly details. At the floor level, use 20 gage solid track (600T150-30 by ClarkDietrich or approved better) anchored to slab.

Install lateral bracing using 400S162-33 C section braces, (minimum 4ft long at 45-degree angle) attached to purlins (approximately 5ft o.c) at the roof and attached to 400S162-33 C section at wall (At wall, channel section shall span minimum 2 studs at each location using #10 SMS).



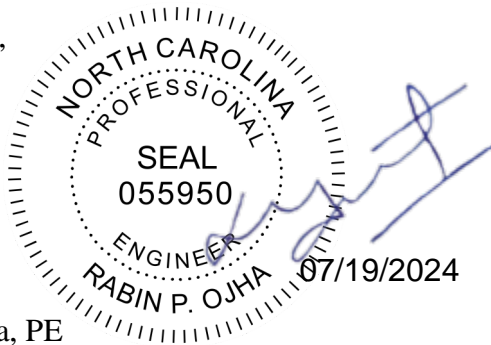
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The lateral bracing shall be installed along full width of the building. The new steel studs shall be attached to each side walls using #10 SMS at maximum of 24” on center. Stud cavities shall be filled with 5-1/2” unfaced fiber glass insulation.

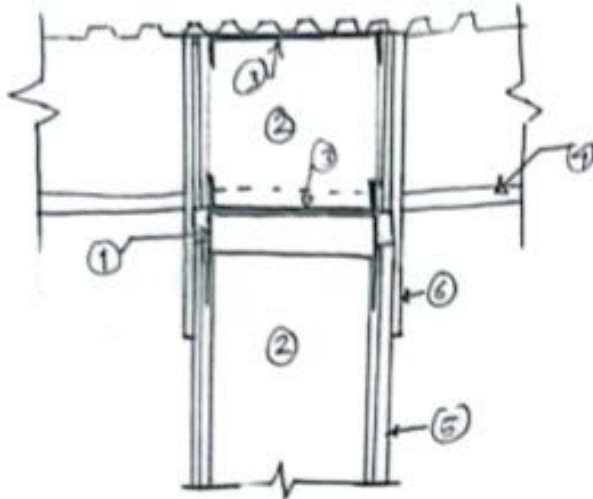
The manufacturer’s recommendation shall be followed for Head-of-Wall (HOW) composite wall construction. Construction means, methods, sequences, and safety precautions in connection with the repair work shall be the contractor’s responsibility. The contractor shall report to the engineer or any dimensional discrepancies.

Please let us know if you have any questions.

Best Regards,



Rabin P. Ojha, PE  
Phone: 919.267.3004



Wall assembly (NTS)

- ① 20 gauge; 2-1/2" leg deflection track { 600 PDT250-30 } connected to purlin with (3) #10 SMS
- ② 6" studs @ 24" O.C. ( 600 PDS125-30mil ) with HOW composite assembly per manufacturer.  
Studs at cripple wall cut to length as required. Attach cripple wall studs to side of purlin web and to floor and ceiling runner with #10 SMS.
- ③ Floor and ceiling runner channel ( 600 T150-30mil ) attached to deflection track and roof deck #10 SMS @ 24" O.C.
- ④ Purlins spaced per building manufacturer.
- ⑤ 2 layers of 5/8" fire shield gypsum board each side. Install full height (below deflection track) vertically using #6 Type S drywall screws @ 12" O.C.
- ⑥ min 5/8" fire shield gypsum board to cover layers of gypsum board on cripple wall and minimum 3 inch lap onto gypsum board of lap assembly.

Picture 1

**600PDS125-30-P (33ksi, G40EQ, Punched)**  
**6" ProSTUD® 30mil Drywall Stud with PDS125 (1-1/4") flange**

Coating: G40EQ

Color Code: Pink

**Geometric Properties**

<b>Web depth:</b> 6.000 in	<b>Design Thickness:</b> 0.0312 in
<b>Flange width:</b> 1.250 in	<b>Minimum thickness:</b> 0.0296 in
<b>Stiffening lip:</b> 0.250 in	<b>Yield strength, Fy:</b> 33 ksi

**Gross Section Properties of Full Section, Strong Axis**

Cross sectional area (A)	0.274 in <sup>2</sup>
Member weight per foot of length	0.932 lb/ft
Moment of inertia (Ix)	1.324 in <sup>4</sup>
Radius of gyration (Rx)	2.199 in
Gross moment of inertia (Iy)	0.043 in <sup>4</sup>
Gross radius of gyration (Ry)	0.396 in

**Effective Section Properties, Strong Axis**

Effective Area (Ae)	0.109 in <sup>2</sup>
Moment of inertia for deflection (Ixe)	1.281 in <sup>4</sup>
Section modulus (Sxe)	0.338 in <sup>3</sup>
Allowable bending moment (Ma)	6,031 in-lbs
Allowable shear force in web (Unpunched section) (Vag)	461 lb
Allowable shear force in web (Punched section) (Vanet)	461 lb

**Torsional Properties**

St. Venant torsional constant (J x 1000)	0.0889 in <sup>4</sup>
Warping constant (Cw)	0.303 in <sup>6</sup>
Distance from shear center to neutral axis (Xo)	-0.651 in
Radii of gyration (Ro)	2.327 in
Torsional flexural constant (Beta)	0.922
Unbraced length (Lu)	28.7 in

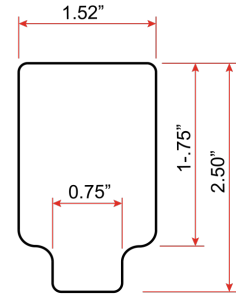
- Effective properties incorporate the strength increase from the cold work of forming as applicable per AISI A3.3.2 of AISI S100-16 (2020) w/S2-20.
- Tabulated gross properties, including torsional properties, are based on full-unreduced cross section of the studs, away from punchouts.
- For deflection calculations, use the effective moment of inertia.
- Allowable moment includes cold work of forming.
- Allowable moment is taken as the lowest value based on local or distortional buckling. Distortional buckling strength is based on a k-phi = 0.

**Code Approvals & Performance Standards**

- [AISI S100-16 \(2020\) w/S2-20](#) North American Specification for the Design of Cold-Formed Steel Structural Members
- [AISI S220-20](#) North American Standard for Cold-Formed Steel Framing - Nonstructural Members
  - (Compliant to ASTM C645, but IBC replaced with AISI S220 in IBC 2015)
  - Section A3 Material - Chemical & mechanical requirements (Referencing ASTM A1003/A1003M)
  - Section A4 Corrosion Protection (Referencing ASTM A653/A653M)
  - Section A5 Products - Thickness, shapes, tolerances, identification
  - Section C Installation - (Referencing ASTM C754)
- [AISI S202-20](#) Code of Standard Practice for Cold-Formed Steel Structural Framing
  - Section F3 Delivery, Handling and Storage of Materials
- [ASTM E72](#) Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
- [ASTM E90](#) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- [ASTM E119](#) Standard Test Methods for Fire Tests of Building Construction and Materials
- [IBC 2024](#) International Building Code
- [Intertek CCRR-0207](#) Non-Structural Metal Framing
- [LA RR #26019](#) City of Los Angeles ProSTUD Research Report
- [NYC OTRC](#) ProSTUD Approval Letter
- [UL Designs 263](#) "Fire Tests of Building Construction and Materials"
- [UL File Number R26512](#) Full list of ProSTUD and ProTRAK UL design assemblies
- [SDS For ASTM A1003 Steel Framing Products](#) For Interior Framing, Exterior Framing and Clips/Accessories



- Embossments in web are only placed on sections 2-1/2" and wider.
- U.S. Patent No. 9,010,070


**Non-Structural Punchout**
**East Coast / Central punch spacing:**

 Center of punchouts are  
 12" from lead end, then 48" o.c.

**West Coast punch spacing:**

 Center of punchouts are  
 24" from lead end, then 24" o.c.

 Center of tail end punchout not less  
 than 12" from end of stud.

 If custom punchout patterns are required,  
 contact ClarkDietrich Sales or local plant for requests.

**Sustainability Credits** For more details and LEED letters contact Technical Services at 888-437-3244 or visit [clarkdietrich.com/LEED](http://clarkdietrich.com/LEED).

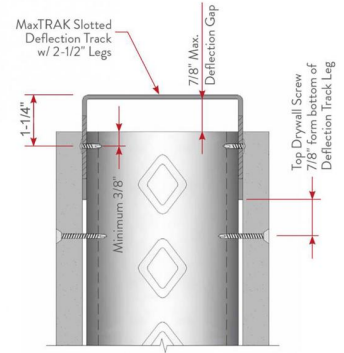
- **LEED v4.1 MR Credit:** Environmental Product Declarations: EPD (1 point) - Sourcing of Raw Materials (up to 2 points) - Material Ingredients (1 point) - Construction and Demolition Waste Management (up to 2 points)
- **LEED v4 MR Credit:** Building Product Disclosure and Optimization: EPD (1 point) - Sourcing of Raw Materials (1 point) - Material Ingredients (1 point) - Construction and Demolition Waste Management (up to 2 points) - Innovation Credit (up to 2 points).

**6" ProSTUD 30MIL (33ksi) Drywall Stud - Head-of-Wall (HOW) Composite Limiting Heights**
**With 30mil 2-1/2" Leg MaxTRAK + (1 layer) 5/8" Type X Gypsum Board each side**

Spacing (inches)	5 psf			7.5 psf			10 psf		
	L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
12	34'-2"	28'-2"	24'-9"	29'-10"	24'-7"	21'-8"	27'-1"	22'-4"	19'-8"
16	31'-9"	26'-2"	23'-0"	27'-9"	22'-10"	20'-1"	25'-2"	20'-9"	18'-3"
24	28'-4"	23'-1"	20'-2"	24'-9"	20'-2"	17'-7"	22'-0" f	18'-4"	-

Allowable HOW composite limiting heights were tested in accordance with AISI S916 and ICC-ES AC86.

- The tests were modified from the standards with the tracks fastened to the test fixture such that the wall stiffness included the track deformation.
- In accordance with current building codes and AISI design standards, the 1/3 Stress Increase for strength was not used.
- The composite limiting heights provided in the tables are based on a single layer of 5/8" Type X Gypsum Board from the following manufacturers: American, CertainTeed, Georgia Pacific, Continental, National, PABCO, and USG.
- The gypsum board must be applied full height in the vertical orientation to each stud flange and installed in accordance with ASTM C754 using minimum No. 6 Type S Drywall screws spaced as listed below:
  - Sheathing screws spaced a maximum of 16 in on-center to framing members (including bottom track) when studs spaced at 16 in or 12 in on-center.
  - Sheathing screws spaced a maximum of 12 in on-center to framing members (including bottom track) when studs spaced at 24 in on-center.
- #8 wafer head screws shall be used for attaching the stud to 30mil 2-1/2" Leg MaxTRAK (as top track) adhering to details below:
  - Stud to track connection must be installed as depicted in figure with a maximum gap of 7/8" between the web of the MaxTRAK and end of stud.
  - Slots in the MaxTRAK Legs allows for a total vertical movement of 1-1/2" (+/- 3/4") with screw centered in slots.
  - Screws shall be placed in each flange of the stud at a minimum of 3/8" from the end of the stud.
  - To permit head of wall deflection, gypsum board must not be fastened directly to the MaxTRAK.
- No fasteners are required for attaching the stud to the bottom track except as detailed in ASTM C
- f: Adjacent to the height value indicates that flexural stress controls the allowable wall height.


**2 layer**
**6" ProSTUD 30MIL (33ksi) Drywall Stud - Head-of-Wall (HOW) Composite Limiting Heights**
**With 30mil 2-1/2" Deep Leg Deflection Track + (1 layer) 5/8" Type X Gypsum Board each side**

Spacing (inches)	5 psf			7.5 psf			10 psf		
	L/120	L/240	L/360	L/120	L/240	L/360	L/120	L/240	L/360
12	33'-1"	28'-2"	24'-9"	28'-11"	24'-7"	21'-8"	26'-3"	22'-4"	19'-8"
16	30'-8"	26'-2"	23'-0"	26'-10"	22'-10"	20'-1"	24'-4"	20'-9"	18'-3"
24	27'-4"	23'-1"	20'-2"	23'-11"	20'-2"	17'-7"	20'-9" f	18'-4"	-

Allowable HOW composite limiting heights were tested in accordance with AISI S916 and ICC-ES AC86.

- The tests were modified from the standards with the tracks fastened to the test fixture such that the wall stiffness included the track deformation.
- In accordance with current building codes and AISI design standards, the 1/3 Stress Increase for strength was not used.
- The composite limiting heights provided in the tables are based on a single layer of 5/8" Type X Gypsum Board from the following manufacturers: American, CertainTeed, Georgia Pacific, Continental, National, PABCO, and USG.
- The gypsum board must be applied full height in the vertical orientation to each stud flange and installed in accordance with ASTM C754 using minimum No. 6 Type S Drywall screws spaced as listed below:
  - Sheathing screws spaced a maximum of 16 in on-center to framing members (including bottom track) when studs spaced at 16 in or 12 in on-center.
  - Sheathing screws spaced a maximum of 12 in on-center to framing members (including bottom track) when studs spaced at 24 in on-center.
- No fasteners are required for attaching the stud to the Deflection Track at the top except as detailed in ASTM C754:
  - Stud to track connection must be installed as depicted in figure with a maximum gap of 7/8" between the web of the Deflection Track and end of stud.
  - To permit head of wall deflection, gypsum board must not be fastened directly to the Deflection Track.
- No fasteners are required for attaching the stud to the bottom track except as detailed in ASTM C754.
- A Spazzer Spacing Bar (or bridging & bracing) shall be installed in the punchouts immediately adjacent to the top Deflection Track to hold studs in place.
- f: Adjacent to the height value indicates that flexural stress controls the allowable wall height

