SA924 09250

USG

drywall-wood framed systems

Drywall/Wood Framed Systems

Introduction

The basic gypsum drywall assemblies described herein offer economical, quickly erected walls and ceilings on wood framing. Excellent sound attenuation at low cost is provided when gypsum panels are resiliently attached. The assemblies are likewise suitable for wall furring and exterior soffit applications. Also designed for wood-frame construction are USG Area Separation Fire Walls/Party Walls fire-rated gypsum drywall assemblies for multi-family housing (see separate System Folder SA925) and SHEETROCK Brand Vinyl-Covered Gypsum Panels (see separate Product Folder SA928).Variations of the systems are outlined below.

Single layer

A basic drywall construction suitable where SHEETROCK Brand Gypsum Panels are applied direct to wood framing—either vertically with long edges parallel to framing, or horizontally with long edges at right angles to framing members. Perpendicular application, recommended except in certain fire-rated partition assemblies, provides greater strength, reduces joint treatment needed, and compensates for uneven framing alignment. Fastening of panels is by four alternative methods:

Standard single nailing: 6″ to 7″ o.c. spacing for ceilings, 7″ to 8″ for walls.

Double nailing: For minimizing defects due to loosely nailed panels. First nails spaced 12″ o.c, followed by second nails in close proximity (2″) of first.

Screw application: Best known insurance against fastener pops caused by loosely attached panels. 1-1/4″ Type W screw is used.

Adhesive application: Continuous bead of drywall stud adhesive applied to framing plus supplementary nailing; improves bond strength by 50% to 100%, greatly reduces face nailing needed. When vinyl foam tape is used on sidewalls with stud adhesive, supplementary fasteners are unnecessary.

Three proven methods of upgrading single layer job quality

SHEETROCK Brand Gypsum Panels SW Edge—Panels have an exclusive tapered rounded edge to help minimize ridging or beading and other imperfections and help compensate for extremes of temperature and humidity during construction.

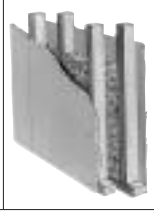
Back-Blocking Joint Reinforcement—A method designed to minimize an inherent joint deformation (“ridging”) that may occur with adverse job and weather conditions.

Floating Interior Angle System—Application of panels to effectively reduce nail pops and angle cracking which may result from stresses at intersections of walls and ceilings.

Double Layer

Systems have a face layer of SHEETROCK Brand Gypsum Panels job-laminated to a base layer of gypsum panels and/or nailed or screw-attached through base layer directly to wood framing in walls and ceilings. Because laminated systems minimize the use of mechanical fasteners in the face layer, finer appearance results—along with greater strength, fire and sound resistance. Adhesive lamination of face layer to base layer is by either of two methods: (a) strip lamination—SHEETROCK Brand Setting-Type (DURABOND) or Lightweight Setting-Type (EASY SAND) Joint Compound or SHEETROCK Brand Taping or All Purpose Joint Compound Ready-Mixed applied in vertical strips 24″ o.c. and supplementary 1-1/2″ Type G screws, or (b) sheet lamination—adhesive applied over the entire panel surface with supplementary Type G screws or temporary supports until adhesive dries.

These assemblies are completed with a United States Gypsum Company joint treatment system and decorating. In walls, however, when predecorated SHEETROCK Brand Vinyl-Faced Gypsum Panels are adhesively applied, joint treatment is not required (see folder SA928).

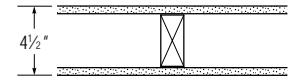
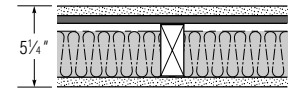
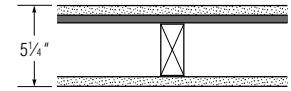
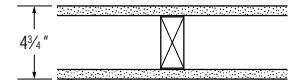
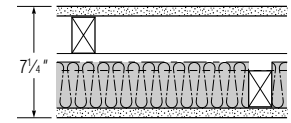
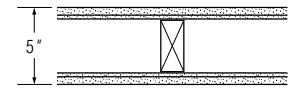
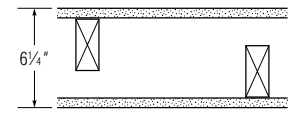
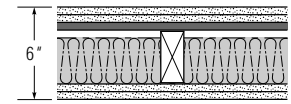
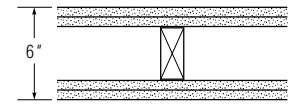
Single-layer staggered stud partition (sys. ref. E)	Double-layer partition (sys. ref. I)	Single-layer resilient partition (sys. ref. B)	Double-layer resilient partition (sys. ref. H)
			

Drywall/Wood Framed Systems

Insulation*

RC-1™ Resilient Channels**

Partition Applications

Fire-rated Construction			Acoustical Performance		
Fire Rating	**Detail & Physical Data**	**Description & Test No.**	**STC**	**Description & Test No.**	**System Reference**
45 min.	 4½″ wt. 6	Wd Stud—1/2″ SHEETROCK Brand gypsum panels, FIRECODE C core—2 x 4 16″ o.c.—panels nailed 7″ o.c.—1-5/8″ cem ctd nails—joints fin—**UL Des U317**	N/A		A
1 hr.	 5¼″ wt. 7	Wd Stud—resil partition—5/8″ SHEETROCK Brand gypsum panels, FIRECODE C core—2 x 4 16″ or 24″ o.c.—3″ THERMAFIBER SAFB—RC-1 chan or equivalent one side spaced 24″ o.c.—panels applied horizontally and att to channels-end joints back-blocked with RC-1 chan or equivalent with 1″ Type S screws—opp side direct att with 1-1/4″ Type W screws—joints fin—perimester caulked—**UL Des U311**	50	**BBN-760903**	B
1 hr.	 5¼″ wt. 7	Wd Stud—resil partition—5/8″ SHEETROCK Brand gypsum panels, FIRECODE core—2 x 4 16″ o.c.—RC-1 chan one side spaced horiz 24″ o.c.—panels att with 1″ Type S screws—joints fin—perimeter caulked—**T-1396-OSU**	41	Based on RC-1 channel one side only—**USG-860802**	C
1 hr.	 4¾″ wt. 7	Wd Stud—5/8″ SHEETROCK Brand gypsum panels, FIRECODE core or SHEETROCK Brand gypsum panels, water-resistant, FIRECODE core—2 x 4 16″ or 24″ o.c.—panels nailed 7″ o.c.—1-7/8″ cem ctd nails—joints exp or fin—perim caulked—**UL Des U305** and **U314**—joints fin	34 37 46	Based on 16″ stud spacing and screws 6″ o.c.—**USG-30-FT-G&H** Based on 24″ stud spacing—**USG-860807** Based on 24″ stud spacing & 3″ SAFB—**BBN-700725**	D
1 hr. est.	 7¼″ wt. 8	Stag Wd Stud— 5/8″ SHEETROCK Brand gypsum panels, FIRECODE core—2 x 3 non-load-bearing studs 16″ o.c.—2 x 3 plates 1″ apart—panels nailed 7″ o.c.—3″ THERMAFIBER SAFB one side—joints fin—perim caulked—est. fire rating based on UL Des U305 and U340	54	Based on SHEETROCK Brand gypsum panels, FIRECODE C core, and on screws or nails 7″ o.c—**TL-77-149**	E
1 hr. est.	 5″ wt. 8	Wd Stud—2 layer— base layer 1/4″ SHEETROCK Brand gypsum panels appl vert with 4d ctd nails—1/2″ panel face layer strip lamin—1/2″ SHEETROCK Brand gypsum panels, FIRECODE C core—2 x 4 16″ o.c.—joints stag & fin—perimeter caulked—est fire rating based on UL Des U305	45 53	**TL-69-52** Based on 5/8″ lamin. FIRECODE C core face layers & 1-1/2″ SAFB—**USG-221-ST-G&H**	F
1 hr.	 6¼″ wt. 8	Stag Wd Stud—5/8″ SHEETROCK Brand gypsum panels, FIRECODE C core—2 x 4 24″ o.c. max on ea side 2 x 6 com plate—panels att with 6d ctd nails or 1-7/8″ screws 7″ o.c.—perim caulked—joints fin—**UL Des U340**	45		G
2 hr.	 6″ wt. 12	Wd Stud—2 layers 5/8″ SHEETROCK Brand gypsum panels, FIRECODE C core, ea side—2 x 4 16″ o.c.—2″ THERMAFIBER SAFB—RC-1 chan or equivalent one side spaced 24″ o.c.—resil side screw att—opp side nail att—both base layers appl vert and face layers appl horiz—base layers perim caulked—joints fin—**UL Des U334**	59 49	**TL-67-239** Based on same construction without SAFB—**TL-67-212**	H
2 hr.	 6″ wt. 12	Wd Stud—2 layers 5/8″ SHEETROCK Brand gypsum panels, FIRECODE core, or SHEETROCK Brand gypsum panels, water-resistant, FIRECODE core, ea side—2 x 4 16″ o.c.—base layer att with 1-7/8″ nails 6″ o.c.—face layer att with 2-3/8″ nails 8″ o.c.—joints fin—**ULC Des U301**	N/A		I

*Where thermal insulation is shown in assembly drawings, the specific product is required in the assembly to achieve the stated fire rating. Fiberglass insulation cannot be substituted for THERMAFIBER Insulation.

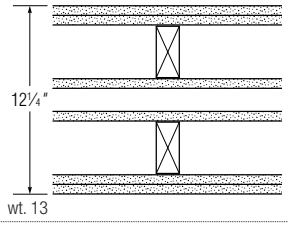
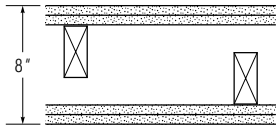
**Where RC-1 is referenced, use RC-1 Resilient Channel or equivalent.

Drywall/Wood Framed Systems

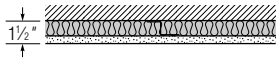
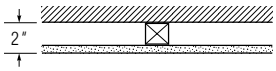
Insulation*

RC-1™ Resilient Channels**

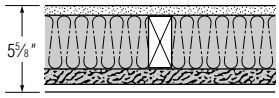
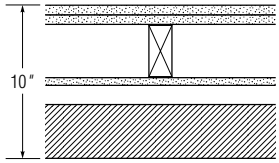
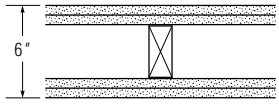
Partition Applications

Fire-rated Construction			Acoustical Performance		
Fire Rating	**Detail & Physical Data**	**Description & Test No.**	**STC**	**Description & Test No.**	**System Reference**
2 hr.	 wt. 13	Wd Stud—2 layers 5/8″ SHEETROCK Brand gypsum panels, FIRECODE core, outside, both sides—5/8″ SHEETROCK Brand gypsum panels, FIRECODE core, inside, both sides—2 rows 2 x 4 24″ o.c.—base layer att with 6d ctd nails 6″ o.c.—face layer att with 8d ctd nails 8″ o.c.—perim caulked—joints fin—**UL Des U342**	N/A		J
2 hr. est.	 wt. 13	Stag Wd Stud—2 layers 5/8″ SHEETROCK Brand gypsum panels, FIRECODE C core—2 x 4 16″ o.c. on 2 x 6 com plate—base layer att with 6d ctd nails 6″ o.c. —face layer att with 8d ctd nails 8″ o.c.—perim caulked —joints fin—est. fire rating based on UL Des U301	47	**TL-69-211**	K

Wall Furring Applications

	Detail & Physical Data	**Description & Test No.**	**Comments**	**System Reference**
		Z-Furring Channels 24″ o.c.—THERMAFIBER FS-15 blankets between channels—1/2″ SHEETROCK Brand gypsum panels, foil-back, screw-attached—joints finished	System suitable for up to 3″ thick insulation; good vapor retarder, no limiting height	L
		Wood furring strips 16″ o.c.—1/2″ SHEETROCK Brand gypsum panels, foil-back—joints finished	Surface not isolated from structural stresses	M

Exterior Wall Applications

Fire-rated Construction				
Fire Rating	**Detail & Physical Data**	**Description & Test No.**	**Comments**	**System Reference**
1 hr.		Wd Stud—5/8″ SHEETROCK Brand gypsum panels, FIRECODE C core, interior—1″ foamed plastic and 1/2″ plywd siding—2 x 4 16″ o.c.—3-1/2″ THERMAFIBER FS-15 blankets—foamed plastic att with 1-1/2″ galv nails, plwd siding att with 10d galv nails 12″ o.c.—gypsum panels appl vert with 6d cem ctd nails 7″ o.c.—joints fin—**UL Des U330**	Rating applicable to fire exposure on interior face only.	N
2 hr.		Wd Stud—2 layers 5/8″ SHEETROCK Brand gypsum panels, FIRECODE core, interior—1/2″ gypsum sheathing and 4″ brick masonry veneer exterior—2 x 4 16″ o.c.—sheathing appl horiz with 11d galv nails 6″ o.c.—gypsum panels appl horiz or vert with nails 8″ o.c.—joints stag & fin—**UL Des U302**		O
2 hr.		Wd Stud—2 layers 5/8″SHEETROCK Brand gypsum panels, FIRECODE core, interior—2 layers 5/8″ SHEETROCK Brand gypsum sheathing, FIRECODE core, exterior—2 x 4 16″ o.c—base layer att with 1-7/8″ nails 6″ o.c.—face layer att with 2-3/8″ nails 8″ o.c. joints— exp of fin—**UL Des U301**		P

Resilient Attachment

SHEETROCK Brand Gypsum Panels are screw-attached to RC-1 Resilient Channels or equivalent, which are screw-attached 24″ o.c. to the framing. The galvanized steel channels "float" the panels away from the framing, providing a spring action that isolates the gypsum panel surface. These systems combine highly effective sound isolation with lightweight low-cost construction.

An excellent value in wood frame party walls consists of single-layer 5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE C Core, resiliently attached to one side of studs and directly attached to the other side, plus 3″ THERMAFIBER SAFB pressed tightly into the stud cavity. This lightweight partition is widely used for its high sound value, STC 50, at costs which are little more than for conventional partition systems. (Use of a filler strip at the base may reduce STC rating.) It also offers 1-hour rated fire resistance; often chosen for use between units in garden apartments.

Where exceptional sound control, greater fire resistance and strength are required, double-layer drywall construction is used with THERMAFIBER SAFB and RC-1 Resilient Channels or equivalent applied to one side of wood studs (see table below).

Sound Transmission Loss—db

System Reference (p. 3 & 4)	Test No.	Method	Band Center Frequency–Hz 125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	STC
H	TL-67-239	Lab	35	41	47	53	56	57	59	60	61	63	64	65	65	64	59	61	59
E	TL-77-149	Lab	31	38	39	45	50	52	55	57	57	57	59	58	57	55	55	57	54
F	USG-221-ST-G&H	Lab	30	37	42	47	48	48	48	51	55	57	58	59	59	57	59	62	53
B	BBN-760903	Lab	26	30	36	42	45	47	50	55	56	57	57	57	55	51	54	58	50
H	TL-67-212	Lab	26	30	33	39	42	47	49	52	55	57	60	61	61	58	53	56	49
K	TL-69-211	Lab	30	33	35	40	40	42	44	46	49	51	52	52	48	48	53	57	47
F	TL-69-52	Lab	21	28	34	35	39	41	41	46	49	51	54	56	55	53	52	55	45
D	USG-860807	Lab	25	20	34	37	33	32	37	36	40	42	44	45	38	34	36	41	37

Area Separation Fire Wall/Party Wall

Fast-erecting non-load-bearing drywall partitions for low-cost fire barriers in wood-frame multi-family housing (see separate Systems Folder SA925).

Wall Furring

SHEETROCK Brand Gypsum Panels, Foil-Back, provide an economical, efficient vapor retarder and a readily decorated interior surface for exterior walls. Panels are attached to wood furring strips 16″ o.c. or screw-attached to Z-Furring Channels 24″ o.c. The channels mechanically attach THERMAFIBER FS-15 Blankets or rigid foam insulation to the interior of exterior walls. The system provides a self-furring solid backup for SHEETROCK Brand Gypsum Panels, Foil-Back, screw-attached to the channels.

Renovation

1/2″ SHEETROCK Brand Gypsum Panels, FIRECODE C Core, screw-attached to Z-Furring Channels with THERMAFIBER SAFB between channels, improve the sound control of wood stud plaster walls. With 3″ channels and 2″ blankets, the assembly provides 50 STC sound rating.

Availability

Gypsum panels for these assemblies are available in five thicknesses and nine types. SHEETROCK Brand Gypsum Panels, FIRECODE Core, and SHEETROCK Brand Gypsum Panels, FIRECODE C Core, obtain higher fire-resistance ratings than regular panels. SHEETROCK Brand Gypsum Panels, Water-Resistant, are recommended as a tile base for tub and shower areas. SHEETROCK Brand Exterior Gypsum Ceiling Board offers superior weather-and-sag-resistance plus excellent paintability in exterior soffits.

Gypsum panels are easily screw-applied to channel-type corrosion-resistant steel studs. See SA923 Drywall/Steel Framed Systems in this series for details.

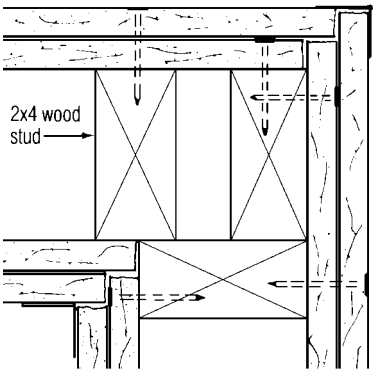
Limitations

1 Type S Screws must be used for attachment of single-layer panels to RC-1 Resilient Channels or equivalent.
2 Resilient channels must be attached to wood framing with 1-1/4″ Type W or Type S Screws. Nails must not be used.
3 Resilient ceilings should not be installed beneath highly flexible floor joists. Install only to framing meeting "Wood Framing Requirements" shown in Gypsum Panels Product Folder SA927.
4 Direct attachment to wood framing with fastener penetration into wood exceeding 1″ is not recommended except where required to meet fire rating.
5 Maximum resilient channel spacing: ceilings—24″ o.c. for joists 16″ o.c.; 16″ o.c. for joists 24″ o.c. Sidewalls—24″ o.c.
6 SHEETROCK Brand Gypsum Panels should not be exposed to excessive or continuous moisture and extreme temperature. Specially formulated SHEETROCK Brand Gypsum Panels, Water-Resistant, are recommended as a base for wall tile in bathrooms and other high moisture areas, but they are not recommended for areas subject to constant moisture such as gang showers and commercial food processing. DUROCK Brand Cement Board is recommended as a ceramic tile base under these conditions.
7 These assemblies are not recommended for exterior soffits and ceilings which project upwards and away from the building proper.
8 Maximum support (studs, joists, channels, furring) spacing for gypsum panels:

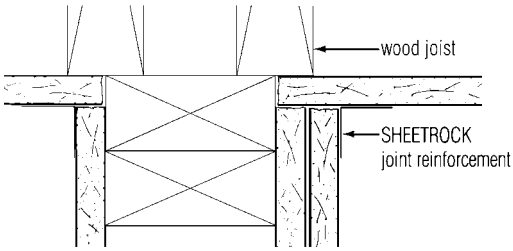
	Panel thickness[1]	Location	Application method[2]	Max. support spacing o.c. in.	mm
Single-Layer Application	3/8″ (9.5 mm)	ceilings[3]	perpendicular [4]	16	406
		sidewalls	parallel or perpendicular	16	406
	1/2″ (12.7 mm)	ceilings	parallel [4]	16	406
			perpendicular	24[5] [6]	610
		sidewalls	parallel or perpendicular	24	610
	5/8″ (15.9 mm)	ceilings[6]	parallel [4]	16	406
			perpendicular	24	610
		sidewalls	parallel or perpendicular	24	610
Double-Layer Application	3/8″ (9.5 mm)	ceilings[7]	perpendicular	16	406
		sidewalls	perpendicular or parallel	24[8]	610
	1/2″ & 5/8″ (12.7 & 15.9 mm)	ceilings	perpendicular	24[8]	610
		sidewalls	perpendicular or parallel	24[8]	610

(1) A 5/8″ thickness is recommended for the finest single-layer construction, providing increased resistance to fire and transmission of sound; 1/2″ for single-layer application in new residential construction and remodeling; and 3/8″ for repair and remodeling over existing surfaces.(2) Long edge position relative to framing. (3) Not recommended below unheated spaces. (4) Not recommended if water-based texturing material is to be applied. (5) Max. spacing 16″ if water-based texturing material is to be applied. (6) If 1/2″ SHEETROCK Brand Interior Gypsum Ceiling Board—Sag-Resistant is used, max. spacing is 24″ o.c. for parallel application with weight of unsupported insulation not exceeding 2.4 psf., when water-based texturing materials are used. (7) Adhesive must be used to laminate 3/8″ board for double-layer ceilings. (8) Max. spacing 16″ o.c. if fire rating required.

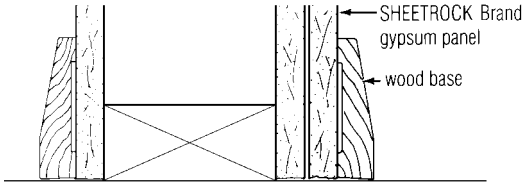
Corner Framing Details



Inside/Outside Corners

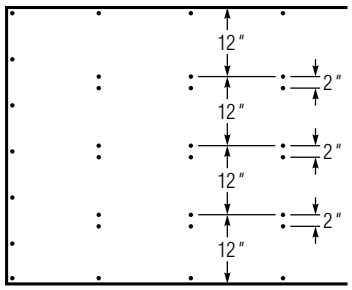


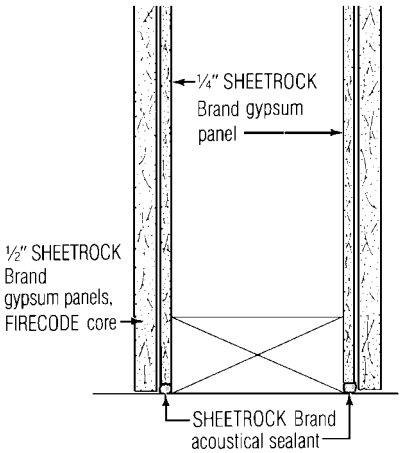
Ceiling Attachment



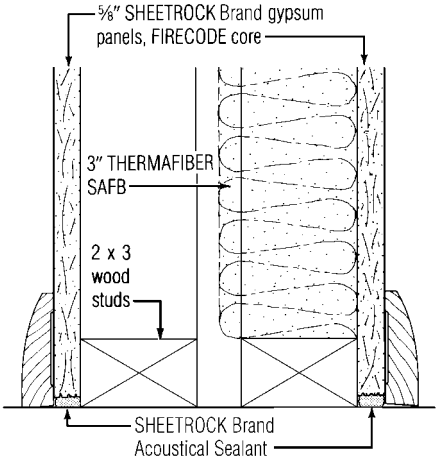
Floor Attachment

Double nailing application



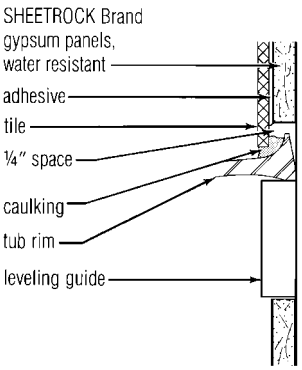


Sound-isolating Partition
Test TL-69-52; 45 STC

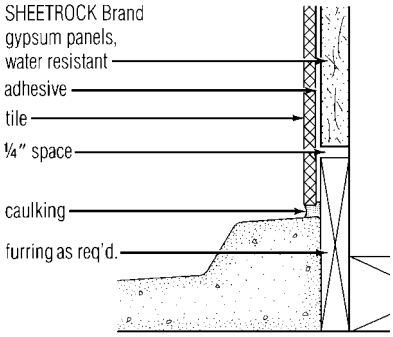


Sound-isolating Chase Wall Partition
Test TL-77-149: 54 STC

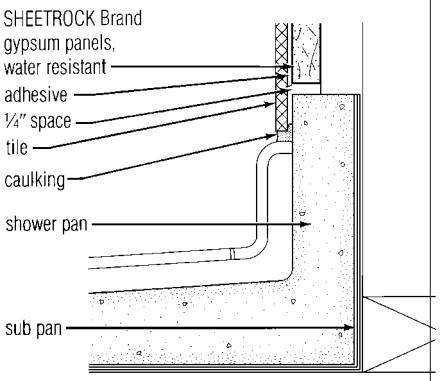
Tub and Shower Details—Single-layer Panels



Tub

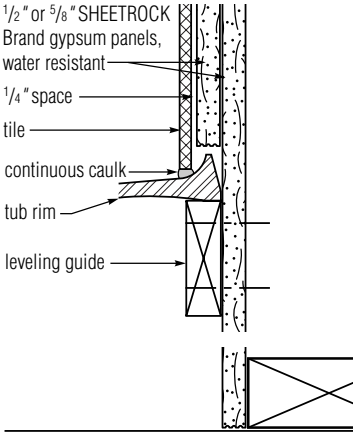


Shower Receptor

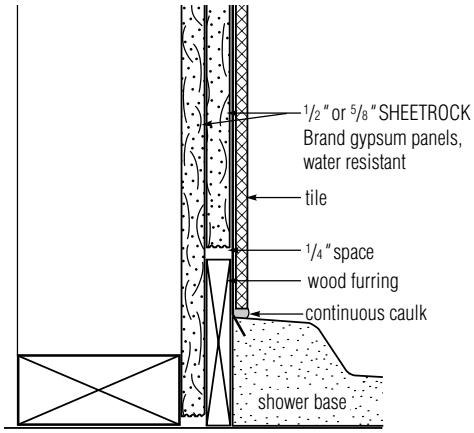


Shower Receptor

Double-layer panels

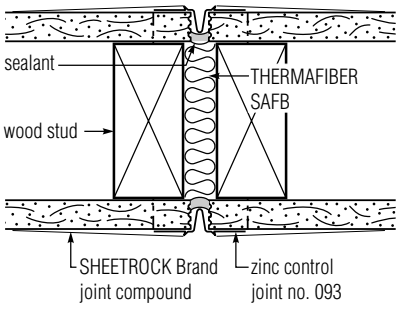


Tub

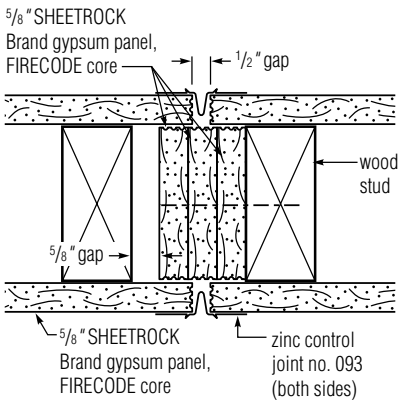


Shower Receptor

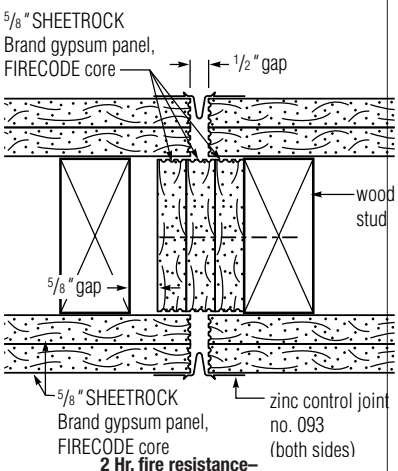
Wall control joint



Fire resistive control joints



1 Hr. fire resistance–estimated based on WH-651-0318.1

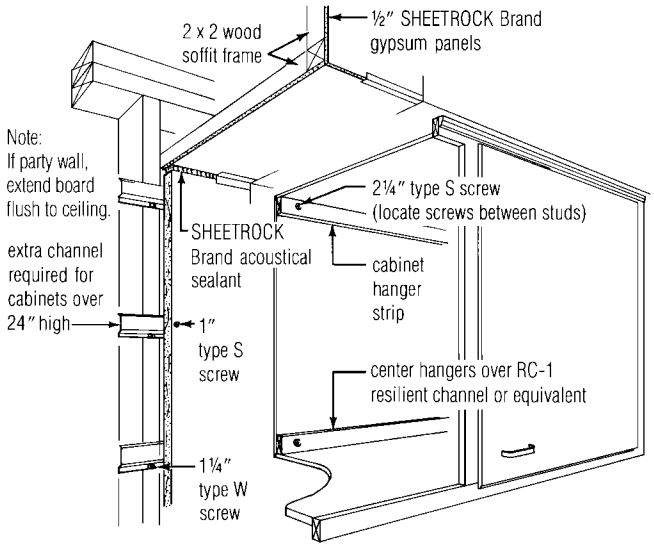


2 Hr. fire resistance–estimated based on WH-651-0318.1

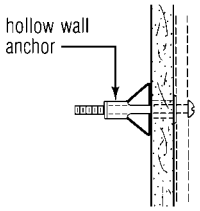
Fastener load data	Fastener type	Size in.	mm	Base assembly	Allow. withdrawal resistance lb.	N(1)	Allow. shear resistance lb.	N(1)
	hollow wall	1/8	3.18	1/2″ gypsum panel	20	89	40	178
	anchor or toggle bolt	3/16	4.76		30	133	50	222
		1/4	6.35		40	178	60	267

(1) Newtons

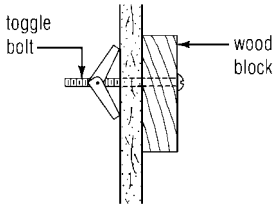
Cabinet Attachment



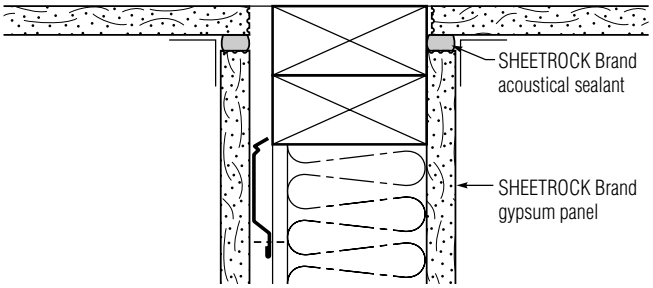
Fixture Attachments—Light

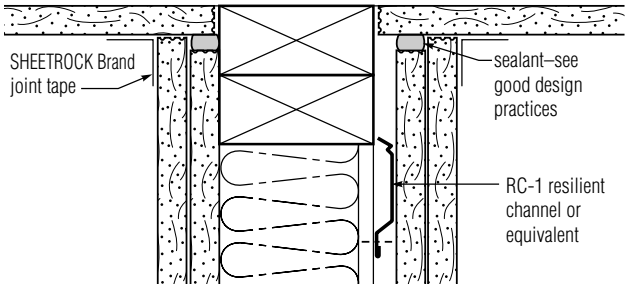


Shower Receptor

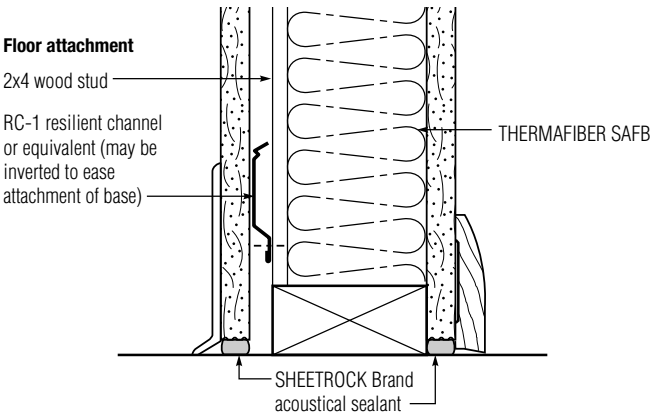


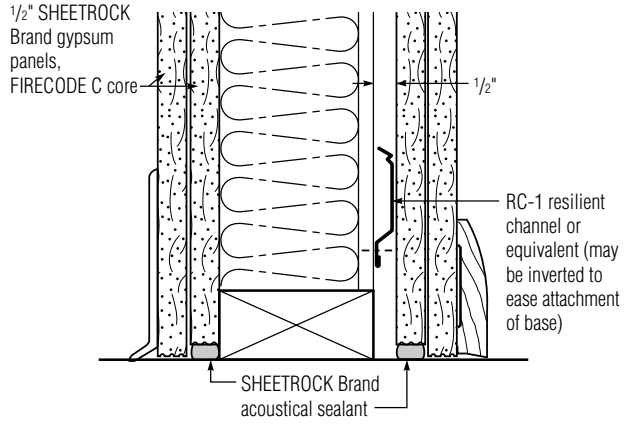
Ceiling attachment





Floor attachment





Ceilings

Single layer

In single-layer ceiling assemblies, SHEETROCK Brand Gypsum Panels are applied across the supports and fastened with nails or screws. Nails are spaced 6″ to 7″ o.c. (6″ for fire-rated construction); 1-1/4″ Type W screws are spaced 12″ o.c. Where no fire rating is required, adhesive nail-on fastening improves bond strength and reduces face nailing.

Resilient attachment

Resilient channel systems offer fire-resistant wood joist floor/ceiling assemblies having highly efficient sound isolation at low cost—qualities particularly needed in apartments, motels and other multi-family buildings. RC-1 Resilient Channels (or equivalent) are screw-attached across wood joists; gypsum panels are attached to channels with Type S screws. A 1-hour fire rating is available with 1/2″ SHEETROCK Brand Gypsum Panels, FIRECODE C Core.

High performance

USG High Performance Floor/Ceiling Systems achieve a 2-hour fire resistance rating (UL Design L541) and deliver STC/MTC ratings as high as 60/54, IIC ratings as high as 62. Floors consist of 1″ SHEETROCK Brand Gypsum Liner Panels over 1/2″ plywood and are finished in one of two ways: (1) ceramic tile over 1/2″ DUROCK Brand Exterior Cement Board, or (2) vinyl tile or carpet/pad over 1/2″ oriented strand board. Ceilings consist of two layers 5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE C Core, applied over RC-1 Resilient Channels or equivalent. Installed within the cavity are 3″ THERMAFIBER SAFB. See data sheet WB1868 for complete information.

Direct suspension

When additional ceiling space is needed to accommodate large ducts or pipes, gypsum panels are screw-attached below a direct suspension system. This direct-hung steel ceiling grid consists of main beam runners 48″ o.c. and cross furring channels spaced 24″ o.c. A cross beam supports the edge of lighting fixtures. With 1/2″ or 5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE C Core, screw-attached to this grid, a one-hour fire-rated wood joist floor/ceiling is provided. The assembly includes provision for lighting fixtures, air ducts and dampers.

Textured ceilings

When water-based texturing materials will be applied, 1/2″ SHEETROCK Brand Interior Gypsum Ceiling Board—Sag-Resistant is ideal because it supports both the sprayed texture and insulation like 5/8″ thick panels but at less cost.

Renovation

To improve the sound control of wood framed floor-ceilings, 1/2″ SHEETROCK Brand Gypsum Panels, FIRECODE C Core, are screw-attached to 2″ Z-Furring Channels fastened to bottom of joists. With 2″ THERMAFIBER SAFB between channels, the system provides 45 STC and 40 IIC ratings (see detail, page 14).

Exterior Soffits

Eaves, canopies, carports and other exterior soffits with indirect exposure to the weather are quickly and economically completed with SHEETROCK Brand Exterior Gypsum Ceiling Board fastened directly to joists (see United States gypsum Company bulletin WB1152 for detailed specification). Maximum frame spacing and other limitations for these systems are shown on page 6.

Single-layer ceiling (sys. ref. A)	**Double-layer ceiling (sys. ref. N)**	**1/2″ sag-resistant interior ceiling board with spray texture**	**Resilient channel with blankets (sys. ref. G)**
			
Ceramic Tile over DUROCK Brand Exterior Cement Board Floor/Ceiling Assembly **STC: 60 MTC: 54 IIC: 52**	**Carpet/Pad over Oriented Strand Board Floor/Ceiling Assembly** **STC: 59 MTC: 54 IIC: 62**	**Vinyl Tile over Oriented Strand Board Floor/Ceiling Assembly** **STC: 58 MTC: 53 IIC: 51**	
			

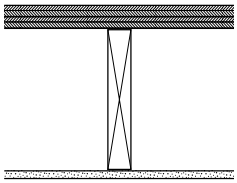
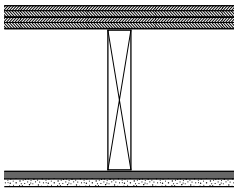
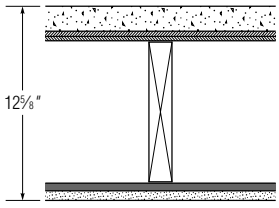
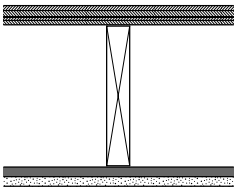
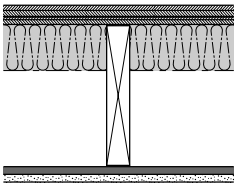
Drywall/Wood Framed Systems

Insulation*

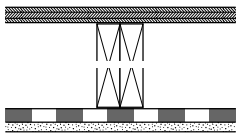
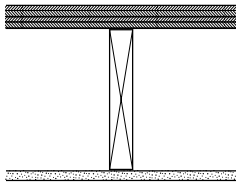
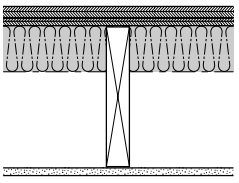
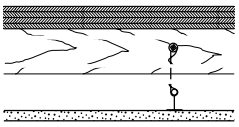
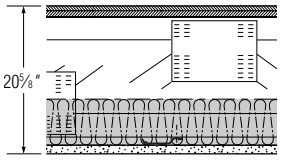
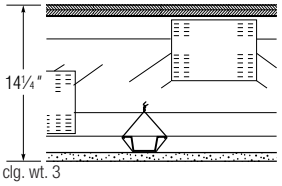
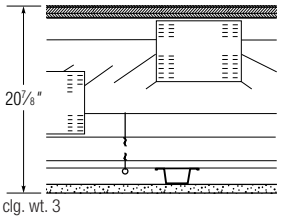
RC-1™ Resilient Channels**

Furring Channels***

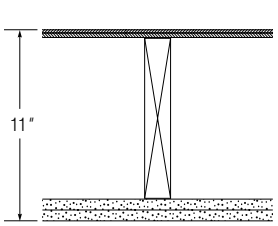
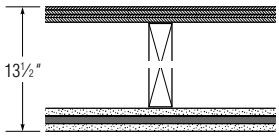
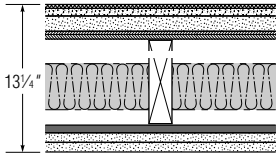
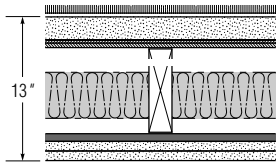
Floor/Ceiling Assemblies

Fire-rated Construction			Acoustical Performance			
Fire Rating	**Detail & Physical Data**	**Description & Test No.**	**STC**	**IIC**	**Description & Test No.**	**System Reference**
1 hr.	 clg. wt. 3	1/2″ or 5/8″ SHEETROCK Brand gypsum panels, FIRECODE C core, ceiling—1″ nom wd sub & fin flr—2 x 10 wd joist 16″ o.c.—panels att with 5d cem ctd nails 6″ o.c. —joints fin—**ULC Des L512**	N/A			A
1 hr.	 clg. wt. 3	Resil ceiling—1/2″ or 5/8″ SHEETROCK Brand gypsum panels, FIRECODE C core—1″ nom wd sub & fin flr—2 x 10 wd joist 16″ o.c.—RC-1 chan or equivalent spaced 24″ o.c.—panels att with 1″ Type S screws—end joints back-blocked with RC-1 chan or equivalent—joints fin—**UL Des L514**	N/A			B
1 hr.	 clg. wt. 3	Resil ceiling—5/8″ SHEETROCK Brand gypsum panels, FIRECODE C core—1-5/8″ perlite-sand conc over 5/8″ plywd sub-floor—2 x 10 wd joist 16″ o.c.—RC-1 chan or equivalent spaced 24″ o.c.—panels att with 1″ Type S screws—end joints back-blocked with RC-1 chan—joints fin—**UL Des L516**	59		Based on 3″ THERMAFIBER SAFB, 3/4″ gypsum concrete and 1/2″ SHEETROCK Brand gypsum panels, FIRECODE C core—**USG 740704**	C
				47	Based on 3″ THERMAFIBER SAFB, vinyl tile atop flooring—**USG 740703**	
				65	Based on 3″ THERMAFIBER SAFB, 44 oz. carpet & 40 oz. pad atop flooring—**USG 740705**	
1 hr. est	 clg. wt. 3	Resil ceiling—1/2″ or 5/8″ SHEETROCK Brand gypsum panels, FIRECODE C core—1-1/4″ nom wd sub & fin flr—2 x 10 wd joist 16″ o.c.—RC-1 chan or equivalent spaced 24″ o.c.—panels att with 1″ Type S screws—end joints back-blocked with RC-1 chan or equivalent —joints fin—est. fire rating based on UL Des L514	47	39	Based on 1/2″ SHEETROCK Brand gypsum panels, FIRECODE C core—**CK-6512-6**	D
			47	37	Based on 5/8″ SHEETROCK Brand gypsum panels, FIRECODE core—**CK-6412-10**	
1 hr. est		Resil ceiling—1/2″ or 5/8″ SHEETROCK Brand gypsum panels, FIRECODE C core—1-1/4″ nom wd sub & fin flr—44 oz carpet & 40 oz pad atop flr—2 x 10 wd joist 16″ o.c.—RC-1 chan or equivalent spaced 24″ o.c.—panels att with 1″ Type S screws—end joints back-blocked with RC-1 chan or equivalent—joints fin—est. fire rating based on UL Des L514	47	67	Based on 1/2″ SHEETROCK Brand gypsum panels, FIRECODE C core—**CK-6512-7**	E
			48	66	Based on 5/8″ SHEETROCK Brand gypsum panels, FIRECODE core—**CK-6412-9**	
1 hr. est	 clg. wt. 3	Resil ceiling—1/2″ or 5/8″ SHEETROCK Brand gypsum panels, FIRECODE C core—1-1/4″ nom wd sub & fin flr—2 x 10 wd joist 16″ o.c.—3″ THERMAFIBER SAFB betw joists—RC-1 chan or equivalent spaced 24″ o.c.—panels att with 1″ Type S screws—end joints back-blocked with RC-1 chan or equivalent—joints fin—est. fire rating based on UL Des L514	51	46	Based on 1/2″ SHEETROCK Brand gypsum panels, FIRECODE C core—**CK-6512-9**	F
			50	46	Based on 5/8″ SHEETROCK Brand gypsum panels, FIRECODE core—**CK-6412-3**	
1 hr. est		Resil ceiling—1/2″ or 5/8″ SHEETROCK Brand gypsum panels, FIRECODE C core—1-1/4″ nom wd sub & fin flr—44 oz carpet & 40 oz pad atop flr—2 x 10 wd joist 16″ o.c.—3″ THERMAFIBER SAFB betw joists—RC-1 chan or equivalent spaced 24″ o.c.—panels att with 1″ Type S screws—end joints back-blocked with RC-1 chan or equivalent—joints fin—est. fire rating based on UL Des L514	52	71	Based on 1/2″ SHEETROCK Brand gypsum panels, FIRECODE C core—**CK-6512-8**	G
			51	70	Based on 5/8″ SHEETROCK Brand gypsum panels, FIRECODE core—**CK-6412-4**	

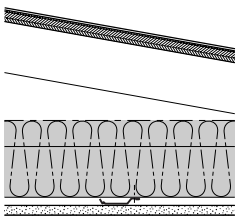
Floor/Ceiling Assemblies

Fire-rated Construction			Acoustical Performance			
Fire Rating	**Detail & Physical Data**	**Description & Test No.**	**STC**	**IIC**	**Description & Test No.**	**System Reference**
1 hr.	 clg. wt. 3	5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE core, ceiling—single 4 x 10 or double 2 x 10 wd joist 48″ o.c.—met fur chan spaced 24″ o.c.—panels att with 1″ Type S screws—joints fin—**UL Des L508**	N/A			H
1 hr.	 clg. wt. 3	5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE core, 1″ nom wd sub & fin flr—2 x 10 wd joist 16″ o.c.—panels att with 6d nails 6″ o.c.—joints fin—**UL Des L501**	38 39	32 56	Based on 1-1/4″ nom wd flr —**CK-6412-7** Based on 1-1/4″ nom wd flr, 44 oz carpet & 40-oz pad atop flooring —**CK-6412-8**	I
1 hr. est	 clg. wt. 3	5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE core, ceiling—1″ nom wd sub & fin flr—2 x 10 wd joist 16″ o.c. —3″ THERMAFIBER SAFB betw joists—panels att with 6d nails 6″ o.c.—joints fin—est. fire rating based on UL Des L501	41 40	32 58	Based on 1-1/4″ nom wd flr—**CK-6412-6** Based on 1-1/4″ nom wd flr, 44 oz carpet 40 oz pad atop flooring —**CK-6412-5**	J
1 hr.	 clg. wt. 3	1/2″ or 5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE C core, ceiling—1″ nom wd sub & fin flr—2 x 10 wd joist 16″ o.c.—susp grid with main run 48″ o.c. and cross tees 24″ o.c.—panels screw-att below grid—joints fin—**UL Des L525**	N/A			K
1 hr.	 clg. wt. 3	5/8″ SHEETROCK Brand Gypsum Panel, FIRECODE C core—wood trusses of min. 2 x 4 lumber secured with steel truss plates—trusses 24″ o.c.—3/4″ nominal plywood subfloor—RC-1 channel or equivalent spaced 12″ or 16″ o.c., panels attached with 1″ Type S screws, joints finished—optional insulation directly over gypsum ceiling membrane—optional ceiling damper—**UL Des L521**	N/A			L
1 hr.	 clg. wt. 3	5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE C core, ceiling—wd truss of 2 x 4 lbr secured with steel truss plates—trusses 24″ o.c.—3/4″ nom plywd flr—met fur chan 24″ o.c. wire-tied to trusses—panels att with 1″ Type S screws 12″ o.c.—joints fin—**UL Des L528**	N/A			M
1 hr.	 clg. wt. 3	5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE C core, ceiling—wd truss of 2 x 4 lbr secured with steel truss plates—trusses 24″ o.c.—3/4″ nom plywd flr—susp grid with main run 48″ o.c.and cross tees 24″ o.c.—panels att with 1″ Type S-12 screws 12″ o.c.—joints fin—**UL Des L529**	N/A			N

Floor/Ceiling Assemblies

Fire-rated Construction			Acoustical Performance			
Fire Rating	**Detail & Physical Data**	**Description & Test No.**	**STC**	**IIC**	**Description & Test No.**	**System Reference**
1 hr. finish rating		Floor/ceiling or roof/ceiling—two layers 5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE Core, attached to wood framing—**GA FC5406 or RC2601**				O
1 1/2 hr. and 2 hr.	 clg. wt. 4/5	Resil ceiling—1-1/2 hr. sys with 2 layers 1/2″ SHEETROCK Brand Gypsum Panels, FIRECODE C core—1″ nom wd sub & fin flr—2 x 10 wd joist 16″ o.c.— RC-1 chan or equivalent spaced 24″ o.c. screw-att over base layer panels—face layer screw att to chan 12″ o.c.—joints fin—**UL Des L510** —2 hr. sys. with 5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE C core—**UL Des L511**	N/A		Assembly not recommended when sound control is a major consideration	P
2 hr.		Floor/ceiling—floor of 8″ x 8″ ceramic tile, 1/2″ DUROCK Brand exterior cement board, 1″ SHEETROCK Brand Gypsum Liner Panels, 1/2″ plywood—2 x 10 wd joist 16″ o.c.—3″ THERMAFIBER SAFB—ceiling of 2 layers 5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE C core, over RC-1 chan 16″ o.c.—**UL Des L541**	60 58 59	52 51 62	**RAL-TL89-141—RAL-IN89-5** Based on vinyl tile over oriented strand board in place of ceramic tile and cement board —**RAL-TL89-145** (53 MTC)—**RAL-IN89-7** Based on carpet/pad over oriented strand board in place of ceramic tile and cement board —**RAL-TL89-146** (54 MTC)—**RAL-IN89-B**	Q
2 hr.		Floor/ceiling—floor of carpet/pad, 1-1/2″ flooring, 1/2″ plywood—2 x 10 wd joist 16″ o.c.—3″ THERMAFIBER SAFB—ceiling of 2 layers 5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE C core, over RC-1 chan 16″ o.c.—**UL Des L541**	59 59	69 37	**RAL-TL90-40** (54 MTC)—**RAL-IN90-5** Based on vinyl tile in place of carpet/pad—**RAL-TL90-40** (54 MTC)—**RAL-IN90-6**	R

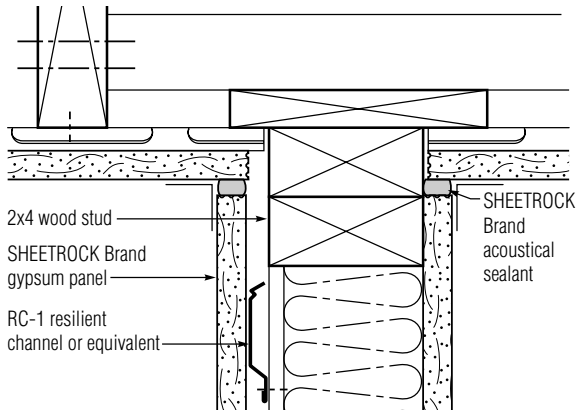
Roof/Ceiling Assemblies

Fire-rated Construction			Acoustical Performance			
Fire Rating	**Detail & Physical Data**	**Description & Test No.**	**STC**	**IIC**	**Description & Test No.**	**System Reference**
1 hr.		5/8″ SHEETROCK Brand Gypsum Panel, FIRECODE C core, pitched wood trusses of min. 2 x 4 lumber, any UL Class A, B or C roofing system—RC-1 channels or equivalent spaced 12″ or 16″ o.c.—gypsum panels attached with 1″ Type S screws, joints finished—optional insulation directly over gypsum ceiling membrane—**UL Des P522**	N/A			S

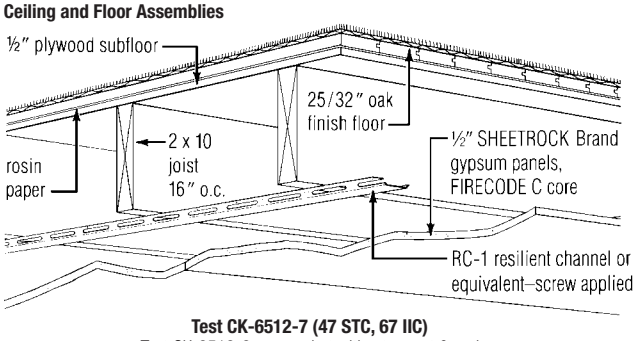
*Where thermal insulation is shown in assembly drawings, the specific product is required in the assembly to achieve the stated fire rating. Fiberglass insulation cannot be substituted for THERMAFIBER Insulation.

**Where RC-1 is referenced, use RC-1 Resilient Channels or equivalent.

Single-layer Panels with RC-1 Channel or equivalent

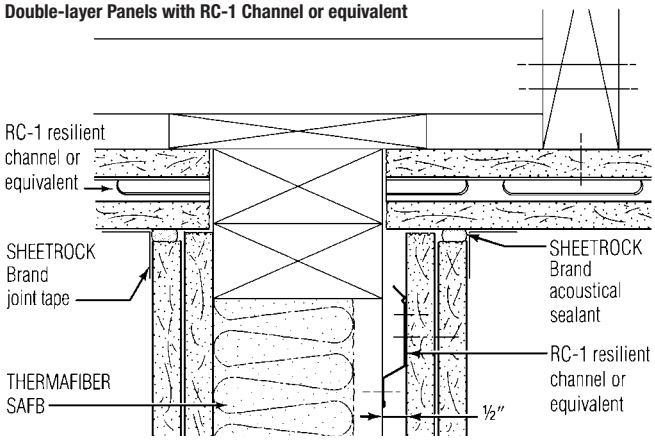


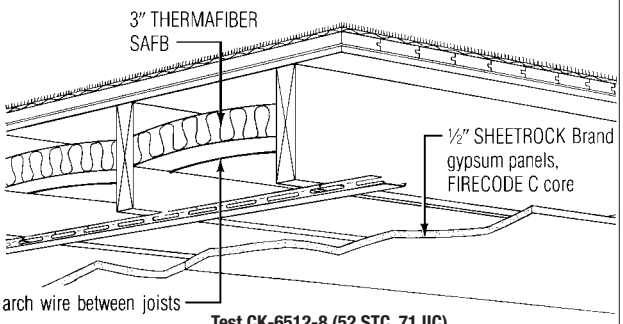
Ceiling and Floor Assemblies



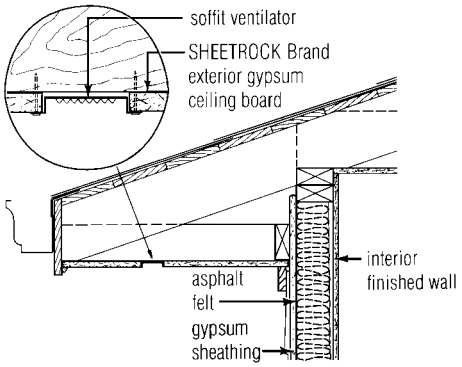
Test CK-6512-7 (47 STC, 67 IIC)
Test CK-6512-6—same but without carpet & pad

Double-layer Panels with RC-1 Channel or equivalent

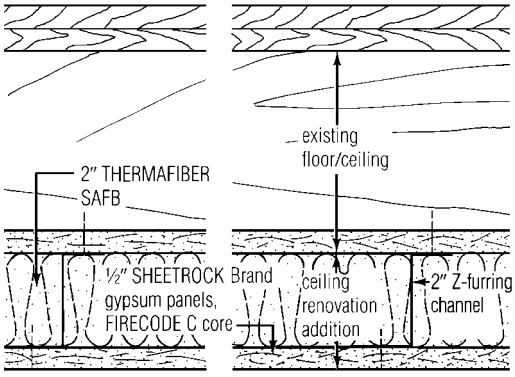




Test CK-6512-8 (52 STC, 71 IIC)
Test CK-6512-9—same but without carpet & pad

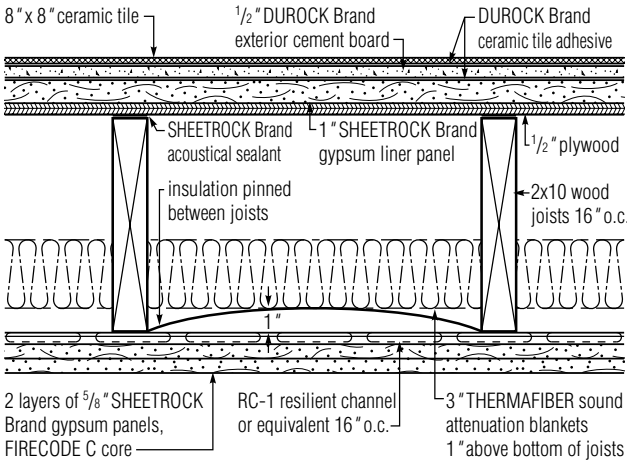


Exterior Wall & Soffit

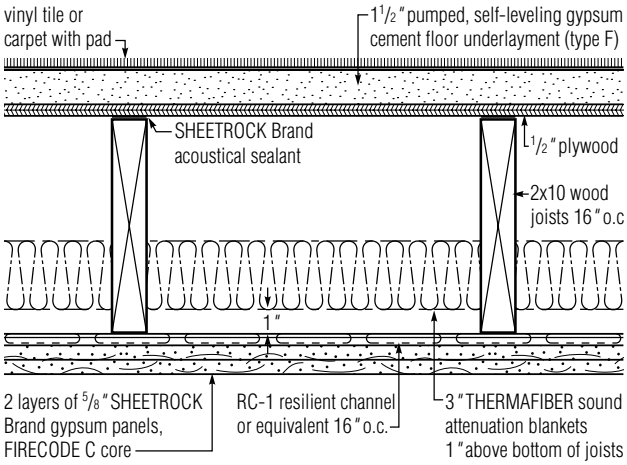


Ceiling Renovation
Test USG-800107; 45 STC
USG-800108; 40 IIC

UL Design L541



Ceramic tile over DUROCK Brand exterior cement board and SHEETROCK Brand gypsum liner panels



Vinyl tile or carpet/pad over type F flooring

Good Design Practices

This section is an overview of design, application, installation and safety concerns that should be addressed when USG's products and systems are used at professional constructions sites or at home in do-it-yourself projects. This section is not intended to be a comprehensive review but instead outline some major issues. No attempt is made at completeness. We recommend that architects and contractors seek the assistance of safety professionals, especially at the professional construction site, because there are many factors to be considered that are not included here. In addition, for more detailed information and references, please refer to Chapter 13 of the USG Gypsum Construction Handbook, Centennial Edition.

1 System Performance

United States Gypsum Company will provide test certification for published fire, sound and structural data covering systems designed and constructed according to its published specifications. Tests are conducted on Company products assembled to meet performance requirements of established test procedures specified by various agencies. System performance following substitution of materials or compromise in assembly design cannot be certified; failure may result under critical conditions.

2 Control Joints

Location of control joints is the responsibility of the design professional/architect. Gypsum panel surfaces should be isolated with control joints or other stress relief where: (a) partition or furring abuts a structural element (except floor) or dissimilar wall or ceiling; (b) ceiling abuts a structural element, dissimilar wall or partition or other vertical penetration; (c) construction changes within the plane of the partition or ceiling; (d) partition or furring run exceeds 30′; (e) ceiling dimensions exceed 50′ in either direction with perimeter relief, 30′ without relief; (f) exterior soffits exceed 30′ in either direction; (g) wings of "L," "U" and "T"-shaped ceiling areas are joined; (h) expansion or control joints occur in the base exterior wall. Ceiling height door frames may be used as control joints. Less than ceiling height frames should have control joints extending to the ceiling from both corners. Treat window openings in same manner as doors.

Gypsum panel surfaces should not be firmly anchored across the flat grain of wide dimensional lumber such as floor joists and headers. Float panels over these members using resilient channels or provide a control joint to counteract wood shrinkage.

3 Penetrations

Penetrations of the gypsum panel diaphragm, such as borrowed lights, access panels, light troffers, require additional reinforcement at corners to distribute concentrated stress if a control joint is not used.

4 Sound Tests

Sound Tests are conducted under ideal laboratory conditions per ASTM procedures. Comparable field performance depends on building design and careful attention to detailing and workmanship. Where these partitions are used for sound control, seal the partition perimeter with 1/4″ minimum round bead of SHEETROCK Brand Acoustical Sealant. Seal around all cutouts for lights, cabinets, pipes, ducts and electrical boxes. Back-to-back penetrations of the diaphragm, flanking paths, door and borrowed-light openings should be avoided. Exterior wall surfaces should be resiliently mounted to minimize flanking paths between floor and ceiling construction.

5 Air, Water and Vapor Control

Flashing and sealants as shown in the construction documents and as selected by the architect and/or structural engineer should be provided to resist air and water infiltration. The flashing and sealants selected shall be installed in a workmanlike manner in appropriate locations to maintain continuity of air/water barriers, particularly at windows, doors and other penetrations of exterior wall. All gypsum sheathing must be covered with No. 15 asphalt felt or equivalent sheet to ensure watertight construction. Asphalt felt should be applied horizontally with 2″ overlap and attached to sheathing. TYVEK sheets should be stapled to sheathing according to manufacturer's directions.

Vapor retarder is normally installed on the warm side of wall in cold climates to prevent interior moisture from entering the stud cavity. The use and location of a vapor retarder should be determined by a qualified mechanical engineer to prevent moisture condensation within the wall. Vinyl wall coverings are not recommended for the interior of walls containing vapor retarders.

6 Ceramic Tile

SHEETROCK Brand Gypsum Panels, Water-Resistant, or DUROCK Brand Cement Boards are recommended as a base for adhesive application of ceramic and plastic tile and plastic-faced wall panels. A vapor retarder is not recommended.

Taping and finishing of SHEETROCK Brand Gypsum Panels, Water-Resistant, is required under tile. It is recommended that all joints and fastener heads be treated with SHEETROCK Brand Setting-Type (DURABOND 45 or 90) or Lightweight Setting-Type (EASY SAND 45 OR 90) Joint Compound. The compound should also be used to embed tape beyond areas to be tiled. These areas should be finished with conventional joint systems.

7 Wood Framing Requirements	Wood framing meeting the minimum requirements of local building codes is necessary for proper performance.
8 Ceiling	To prevent objectionable sag in new gypsum panel ceilings, the weight of overlaid unsupported insulation should not exceed 1.3 psf for 1/2″ thick panels with frame spacing 24″ o.c.; 2.4 psf for 1/2″ panels on 16″ o.c. framing (or 1/2″ SHEETROCK Brand Interior Gypsum Ceiling Board—Sag-Resistant on 24″ o.c. framing) and 5/8″ panels 24″ o.c.; 3/8″ thick panels must not be overlaid with unsupported insulation. A vapor retarder should be installed in exterior ceilings, and the plenum or attic space should be properly vented. During periods of cold or damp weather when a polyethylene vapor retarder is installed on ceilings behind the gypsum board, it is important to install the ceiling insulation before or immediately after installing the ceiling board. Failure to follow this procedure may result in moisture condensation on the back side of the gypsum board, causing the board to sag. Water-based textures, interior finishing materials and high ambient humidity conditions can produce sag in gypsum ceiling panels if adequate vapor and moisture control is not provided. The following precautions must be observed to minimize sagging of ceiling panels: 1 Where vapor retarder is required in cold weather conditions, the temperature of the gypsum ceiling panels and vapor retarder must remain above the interior air dew point temperature during and after the installation of panels and finishing materials. 2 The interior space must be adequately ventilated and air circulation must be provided to remove water vapor from the structure. Most sag problems are caused by the condensation of water vapor within the gypsum panel. The placement of vapor retarders, insulation levels and ventilation requirements will vary by location and climate and should be reviewed by a qualified engineer if in question.
9 Back-Blocking	Ridging or deformation at the panel joints may occur in gypsum board construction under adverse job or weather conditions. Back blocking end joints will minimize joint ridging and is recommended. Where back-blocking is used, float the end joints between supports and back-block with a 8″ wide strip of gypsum board the full length of the joint adhesively applied over abutting ends. For fire-rated resilient construction, back butt-end joints with RC-1 Resilient Channels or equivalent. Refer to *Gypsum Construction Handbook* for complete details.
10 Fixture Attachment	Lightweight fixtures and trim should be installed using expandable anchors for screw attachment. Medium and heavyweight fixtures are not recommended on resilient surfaces, but, if required, they should be supported from the primary framing.
11 Double-Layer Laminated 3/8″ Panels	In this assembly, use scaffold nails driven through gypsum blocks into the framing at third points vertically for temporary shoring. The 1-1/2″ Type G screw is not recommended.
12 Acoustical Tile	Treatment of joints and screwheads with joint compound may be omitted where gypsum panels serve as a base for adhesively applied acoustical tile.
13 SHEETROCK Brand Exterior Gypsum Ceiling Board	Exposed surfaces should receive two coats of good quality exterior paint. First coat: oil-based primer; second coat: either alkyd or latex exterior paint.
14 Shadowing	During periods of low outside temperature, airborne dirt may collect, producing photographing or shadowing over fasteners and furring of exterior walls. This natural phenomenon occurs through no fault of the products.
15 WARNING: COMBUSTIBLE	Rigid foam (cellular plastic) insulation will ignite if exposed to fire of sufficient heat and intensity. Use only as directed by the specific instructions accompanying the product.
16 Additional Information	See technical folders in this series: *Construction Selector* SA100 for fire and sound-rated systems; *Gypsum Panels & Accessories* SA927 for information on system components; *Textures and Finishing Products* SA933 for finishing product specifications; *DUROCK Brand Cement Board Folder* SA932 for data on ceramic tile base.

Part 1: General

1.1 Scope

Specify to meet project requirements.

1.2 Qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be installed in accordance with its current printed directions.

1.3 Delivery and Storage of Materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises. **Warning:** Store all SHEETROCK Brand Gypsum Panels flat. Panels are heavy and can fall over, causing serious injury or death. Do not move unless authorized.

1.4 Environmental Conditions

In cold weather during gypsum panel joint finishing, temperatures within the building shall be maintained above 55 °F (13 °C). Adequate ventilation shall be provided to carry off excess moisture.

Part 2: Products

2.1 Materials

A **Gypsum Board:** 48″ wide—(1/4″) (3/8″) (1/2″) thick (Regular) (Foil-Back) SHEETROCK Brand Gypsum Panels; (1/2″) (5/8″) thick (Foil-Back) SHEETROCK Brand Gypsum Panels, FIRECODE (C);(1/2″) (5/8″) thick SHEETROCK Brand Gypsum Panels, Water-Resistant; (1/2″) thick SHEETROCK Brand Gypsum Panels, Water-Resistant, FIRECODE C; (5/8″) thick SHEETROCK Brand Gypsum Panels, Water-Resistant, FIRECODE; (1/2″) (5/8″) thick SHEETROCK Brand (FIRECODE) Exterior Gypsum Ceiling Board; 1/2″ thick SHEETROCK Brand Interior Gypsum Ceiling Board—Sag-Resistant—lengths as required.

B **Cement Board:** (1/2″) (5/8″) DUROCK Brand Cement Board.

C **Sheathing:** 48″ wide, 1/2″ x (24″) (48″ wide) SHEETROCK Brand Gypsum Sheathing; 5/8″ x (24″ wide) (48″ wide) SHEETROCK Brand Gypsum Sheathing, FIRECODE; 1/2″ x (24″ wide) (48″ wide) GYP-LAP Gypsum Sheathing; 5/8″ x (24″ wide) (48″ wide) GYP-LAP (Type X) Gypsum Sheathing.

D **Finishing Products:** Joint Treatment: SHEETROCK Brand Joint Tape; SHEETROCK Brand Fiberglass Drywall Tape (must use a setting-type joint compound for first coat over tape); SHEETROCK Brand Setting-Type (DURABOND) or Lightweight Setting-type (EASY SAND) Joint Compound (20, 45, 90, 210, 300); SHEETROCK Brand Joint Compound (Taping, Topping, All Purpose). SHEETROCK Brand Ready-Mixed Joint Compound (Taping, Topping, All Purpose), SHEETROCK Brand Lightweight All Purpose Joint Compound Ready-Mixed (PLUS 3). SHEETROCK Brand Ready-Mixed All Purpose Joint Compound (Midweight).

E **Adhesive:**

1 (for Back-Blocking and Fire-Rated Double-Layer Systems)—SHEETROCK Brand Setting-Type (DURABOND) or Lightweight Setting-Type (EASY SAND) Joint Compound or SHEETROCK Brand Joint Compound Ready-Mixed—(All Purpose) (Taping).
2 (for Non-Rated Double-Layer Systems)—Laminating or Liquid Contact Adhesive.
3 (for Adhesive Application)—Drywall Stud Adhesive (must comply with ASTM C557 in partitions).
4 (for Non-Rated Systems—specify with adhesive above).
5 Vinyl Foam Tape.

F **Fasteners:**

1 Screws: (1-1/4″ Type W) (1-1/2″ Type G) (3/8″, 1″, 1-1/8″, 1-1/4″, 1-5/8″, 1-7/8″ Type S) (1″ Type S-12).
2 (for Non-Rated Systems)—1-1/4″, 1-3/8″ (Annular Ring Drywall) (Cement Coated Cooler) Nails—obtain locally.
3 (for Fire-Rated Systems)—specify from fire test report.
4 (for sheathing—11-ga. (7/16″) (1″) dia. head galvanized roofing nails, (1-1/2″) (1-3/4″) long—obtain locally.
5 (for DUROCK Brand Cement Board)—1-1/4″ DUROCK Brand screws.

G **Trim Accessories:** Corner Angles: Metal Angles, 2-1/2″ x 2-1/2″ x 24 ga. corrosion-resistant steel, lengths as required.
Corner Reinforcement: DUR-A-BEAD Corner Bead No. 103. No. 800. SHEETROCK Brand Paper Faced Metal Bead (Tape -On Bead) (Nail-On-Bead).
Metal Trim: Metal Trim No. (200-A 1/2″ or 5/8″, 200-B 1/2″ or 5/8″, 401 or 402, 801-A 1/2″ or 5/8″, 801-B 1/2″ or 5/8″). SHEETROCK Brand Paper Faced Metal Trim.

H Zinc Control Joint No. 093.

I RC-1 Resilient Channel or equivalent.

J THERMAFIBER Sound Attenuation Fire Blankets; (1-1/2″) (2″) (3″) x 16″ or 24″ x 48″. THERMAFIBER Fire-Safety FS-15 Blankets (1″) (2″) (3″) (3-1/2″) (5-1/4″) (6″) x 15″ or 23″ x 48″.

K **Sealant:** SHEETROCK Brand Acoustical Sealant.

Part 3: Execution

3.1 Single-Layer Systems

3.1.1 Gypsum Panel Erection: Direct Attachment—Apply gypsum panels to ceilings first, then to walls. Place panels (perpendicular to framing) (parallel to framing). When using perpendicular application, position all ends over framing members. Use maximum practical lengths to minimize end joints. Fit ends and edges closely, but not forced together. Stagger end joints in successive courses. Place end joints on opposite sides of partitions on different studs. When necessary, cut ends, edges and cutouts within field of panel in a workmanlike manner. Cut panels with a razor knife and straight edge. Avoid cutting with power tools. If cut with a power tool, tool must be equipped with a dust collector.

Drive fasteners in field of panel first, working toward ends and edges. Hold panel in firm contact with framing while driving fasteners. Space perimeter fasteners at least 3/8″ from ends and edges. Drive nails home with heads slightly below surface of panels to provide a uniform dimple 1/32″ deep. Do not use a nail set; avoid breaking face paper.

Attach gypsum panels to framing supports by:

A Standard single nailing method: Attach panels with specified nails spaced 7″ o.c. max. for ceilings, 8″ o.c. max. for walls.

B Adhesive application: Attach gypsum panels with drywall stud adhesive applied in a continuous 3/8″ bead at center of attachment to face of framing members. Where two panels meet on a framing member, apply two beads permitting adhesive contact to both panels. Do not apply adhesive to members such as bridging, diagonal bracing, etc., into which no supplemental fasteners will be driven. Immediately following panel erection, apply fasteners per manufacturer's directions. Hand impact panel along framing to ensure contact at all points.

C Double-nailing method: Attach gypsum panels with nails spaced 12″ o.c. with second nails in close proximity (2″ away).

D Power-driven screws: Attach gypsum panels with 1-1/4″ Type W screws—spaced 16″ o.c. max. for walls, 12″ o.c. for ceilings.

E Vinyl Foam Tape: Attach gypsum panels, using stud adhesive and 8″ tape strips applied according to manufacturer's directions.

3.1.2 SHEETROCK Brand Gypsum Panels, Water-Resistant, Erection

A Framing: If necessary, fur out studs so inside face of shower receptor is flush with gypsum panel face. Install appropriate blocking or headers to support tub and other plumbing fixtures, and to receive soap dishes, grab bars, towel racks and other hardware. When studs are more than 16″ o.c., or when ceramic tile over 5/16″ thick will be used, install suitable blocking between studs. Place blocking approximately 1″ above top of tub or receptor and at midpoint between base and ceiling.

B Gypsum Panels: After tub, shower pan or receptor is installed, place temporary 1/4″ spacer strips around lip of fixture. Pre-cut panels to required sizes and make necessary cut-outs. Before installing panels, brush thinned tile adhesive over all cut or exposed panel edges at utility holes, joints and intersections.

Install panels perpendicular with paperbound edge abutting top of spacer strip. Fasten panels with nails 8″ o.c. max., or screws 12″ o.c. max. Where ceramic tile more than 5/16″ thick will be used, space nails 4″ o.c. max. and screws 8″ o.c. max. Adhesive application (see 3.1.1 B above) may be used for attaching panels when ceramic tile no more than 5/16″ thick will be used.

In areas to be tiled, treat all fastener heads with SHEETROCK Brand Setting-Type (DURABOND) or Lightweight Setting-Type (EASY SAND) Joint Compound. Fill tapered edges in gypsum panel with this SHEETROCK Brand Setting-Type Compound, embed SHEETROCK Brand Joint Tape firmly and wipe off excess compound. Follow immediately with a second coat over the taping coat, being careful not to crown the joint. Fold and embed tape properly in all interior angles to provide a true angle.

In areas not to be tiled, embed tape and treat fasteners with SHEETROCK Brand Setting-Type (DURABOND) or Lightweight Setting-Type (EASY SAND) Joint Compound applied in the conventional manner. Finish with at least two coats of joint compound applied according to directions.

Prior to tile erection, seal cut panel edges of all openings around pipes, fittings and fixtures with thinned tile adhesive. Remove spacer strips, but do not caulk gap at bottom of panels. **Note:** Using an adhesive approved by the tile manufacturer, install tile down to top edge of shower floor or tub and overlapping lip or return of tub or receptor. Fill all tile joints with an unbroken application of grout. Apply caulking compound between the tile and shower floor or tub.

3.1.3 Floating Interior Angle System—Apply gypsum panels to ceilings first. Follow standard framing practices for corner fastening. Fit panels snugly at all angles. Apply gypsum panels to walls to maintain firm support for ceiling panels. At horizontal angles, apply the first fastener 8″ from the intersection. At vertical interior angles attach the overlapping panel only, at the angle. Use conventional fastening in remainder of area.

3.2 Double-Layer Systems

3.2.1 Base Layer Erection—Direct Attachment

A Ceilings: Apply gypsum panel base layer on ceilings first (perpendicular to framing) (parallel to framing). Position end joints to offset face layer joints by at least 16″; joints may occur on or between framing members. Apply foil-back panels with foil side against framing.

B Sidewalls: Apply gypsum panel base layer with long edges centered on framing members (parallel). When pre-decorated face layers will be used, apply base layer horizontally. Apply foil-back panels with foil side against framing. Attach panels to framing supports by (screw) (nail) attachment as follows:

C Screw Attachment: Attach panels with power-driven 1-1/4″ Type W screws spaced 16″ o.c. max. for walls, 12″ o.c. max. for ceilings. Stagger screws on adjoining edges and ends.

D Nail Attachment: Attach panels with specified nails spaced 8″ o.c. max. for walls, 7″ o.c. max. for ceilings. Drive nails so heads are flush with surface and opposite each other on adjacent ends and edges.

Drive fasteners in field of panel first, working toward ends and edges. Hold panel in firm contact with framing while driving fasteners. Space fasteners 3/8″ min. from ends and edges.

3.2.2 Face Layer Erection: Direct Attachment—Use gypsum panels in maximum practical lengths to minimize end joints. Fit ends and edges closely, but not forced together. Stagger joints at least 16″ from parallel joints in base layer. When necessary, cut ends, edges and cutouts within field of panels in a workmanlike manner.

After panels are cut to size, mix and apply adhesive according to manufacturer's directions and laminate face layer to base layer in the following manner:

Sheet Lamination—For fire-rated construction on walls, apply specified SHEETROCK Brand Setting-Type (DURABOND) or Lightweight Setting-type (EASY SAND) Joint Compound, or SHEETROCK Brand Joint Compound Ready-Mixed (Taping or All Purpose) to entire back surface of face panels and to extreme edges of panels. Apply adhesive in beads approximately 3/8″ wide at base and 1/2″ high and spaced 1-1/2″ to 2″ o.c. Laminate face layer to base layer using moderate pressure and temporary support or supplemental fastening as follows:

A Temporary nailing: Use double-headed nails with at least 3/4″ penetration into framing. Space nails 16″ to 24″ o.c. When proper bond is developed, remove nails and dimple holes for joint treatment.

B Temporary supports: Brace or shore face layer every 16″ to 24″. When proper bond is developed, remove supports.

C Screws: Permanently attach face layer with 1-1/2″ Type G screws. Space screws along edges 36″ o.c. max., within 2″ of joint and 12″ of both ends. In field of panel, space screws along centerline, 48″ max. and within 24″ of ends.

Strip Lamination—For fire-rated construction on walls, apply specified SHEETROCK Brand Setting-Type (DURABOND) or Lightweight Setting-Type (EASY SAND) Joint Compound, or SHEETROCK Brand Taping or All Purpose Joint Compound Ready-Mixed to base layer panels in vertical strips of four 1/2″ beads, 1-1/2″ to 2″ o.c. Space strips 24″ o.c. Permanently attach face layer with 1-1/2″ Type G screws placed to penetrate adhesive strips. Space screws along edges 36″ o.c. max., within 2″ of joint and 12″ of both ends. In field of panel, space screws along centerline, 48″ o.c. max. and within 24″ of both ends.

For non-rated construction, laminate face to base layer as follows:

Laminating Adhesive—Apply adhesive in strips using notched spreader having 1/4″ x 1/4″ min. notches spaced 2″ o.c. max. Apply strips to back of face panel in center and along both edges. Position panel, press firmly in place and fasten as required. For walls, use pre-bowed panels, erect panels vertically and fasten 16″ o.c. at top and bottom of panel. For ceilings, space fasteners 16″ o.c. along edges and ends, with one permanent fastener per framing member at mid-width of panel.

Liquid Contact Adhesive—Apply adhesive to both contact surfaces according to manufacturer's directions; let adhesive air-dry; erect panels as soon as possible after drying. Position panel, press panel firmly in place and fasten as required. For perpendicular application to walls and for all ceiling applications, fasten face panel at each corner and along edges spaced 48″ o.c. max. For parallel application to walls, use pre-bowed panels and fasten 16″ o.c. at top and bottom of panel.

Vinyl Foam Tape—Attach gypsum panels, using laminating adhesive and vinyl foam tape applied in continuous strips across back face of panel according to manufacturer's directions.

For mechanical attachment in non-rated construction, space nails 7″ o.c. on ceilings, 8″ o.c. walls; space screws 12″ o.c. on ceilings, 16″ o.c. on walls.

3.2.3 Face Layer Erection: SHEETROCK Brand Vinyl-Covered Gypsum Panels—Before application, pre-bow panels to a 2″ permanent bow convex to face of studs. Apply pre-bowed panels vertically with joints staggered at least 10″ from parallel joints in base layer. Position less-than-full-width panels with cut edge at corner. When necessary, cut ends, edges and cutouts within field of panels in a workmanlike manner.

For fire-rated construction, install panels using specified SHEETROCK Brand Setting-Type (DURABOND) or Lightweight Setting-Type (EASY SAND) Joint Compound, or SHEETROCK Brand Taping or All Purpose Joint Compound Ready-Mixed as laminating adhesive. Apply adhesive to base layer in vertical strips of four 1/2″ beads, 1-1/2″ to 2″ o.c. Space strips 24″ o.c. Fasten panels 16″ o.c. at top and bottom of panel.

For non-rated construction, install face layers, using (laminating) (liquid contact) adhesive as follows:

A **Laminating Adhesive:** Apply adhesive in strips using notched spreader having 1/4″ x 1/4″ min. notches spaced 2″ o.c. max. Apply strips to back of face panel in center and along both edges. Position panel, press firmly in place and fasten 16″ o.c. at top and bottom.

B **Liquid Contact Adhesive:** Apply adhesive to both contact surfaces according to manufacturer's directions; let adhesive air-dry; erect panels as soon as possible after drying. Position panel, press firmly in place and fasten 16″ o.c. at top and bottom.

Finish joints, edges, corners with SHEETROCK Brand Vinyl-Faced Mouldings matching panel finishes and installed according to manufacturer's directions.

3.3 Resilient Attachment Systems

3.3.1 **Resilient Channel Erection—**Position resilient channels at right angles to wood framing, space (16″) (24″) o.c. and attach to each support with 1-1/4″ Type W or 1-1/4″ Type S screws driven through holes in channel mounting flange.

On walls, install channels with mounting flange down. (Channel may be inverted at floor to accommodate attachment of base.) Locate channels 2″ from floor and within 6″ of ceiling. Extend channels into all corners and attach to corner framing. Position channels max. 6″ from wall-ceiling angle. Cantilever channel ends no more than 6″. For double-layer system, attach channel through base layer to framing with 1-7/8″ Type S screws. Splice channel by nesting directly over framing member, screw-attach through both flanges. Reinforce with 3/8″ pan head screws located at both ends of splice. Use of a filler strip at the base may reduce STC rating.

Where cabinets are to be installed, attach RC-1 Resilient Channels (or equivalent) to studs at center of top and bottom cabinet hanger brackets. When distance between hangers exceeds 24″ o.c., install additional channel at mid-point between hangers. **Note:** Screws attaching cabinets to resilient channels should be placed between studs. Screws that contact studs reduce the system's resiliency and sound rating.

3.3.2 **Gypsum Panel Erection: Ceilings—**

A **Base Layer:** For fire-rated assembly, apply gypsum base-layer panels with long edges across joists and end joints staggered. Fasten panels to framing with 8d cement-coated nails spaced 7″ o.c. Attach resilient channel through base layer perpendicular to framing with 1-7/8″ Type S screws spaced 24″ o.c. for joists 16″ o.c.; spaced 16″ o.c. for joists 24″ o.c.

B **Face Layer:** Apply face-layer panels of maximum practical length with long dimension perpendicular to resilient channels and end joints staggered. End joints may occur over resilient channels or midway between channels with joint floated and back-blocked. Fit ends and edges closely, but not forced together. Fasten panels to channels with 1″ Type S screws spaced 12″ o.c. in field of panels and along abutting ends. Cut panels neatly and provide support at cutouts and openings.

3.3.3 **USG High Performance Floor/Ceiling System**

A **Floor:** Apply 3/8″ bead of SHEETROCK Brand Acoustical Sealant to the center of the top flange of the joists. Place 1/2″ thick min. APA span rated exterior grade plywood sheets with long dimension across wood joists spaced 16″ o.c. Fasten plywood to wood joists with (6d)(8d) cc sinkers 6″ o.c. along supported ends and 10″ o.c. at intermediate joists.

Install SHEETROCK Brand Gypsum Liner Panels after the structure is fully enclosed and all interior partitions are installed. Loose lay the liner panels on the subfloor with the long dimension at a right angle to the wood joists. Stagger panel end joints and fit panels closely to wall intersections without forcing. Seal the perimeter of the floor with SHEETROCK Brand Acoustical Sealant to provide an airtight seal.

Finish floor with DUROCK Brand Cement Board and either ceramic tile, oriented strand board and vinyl tile or carpet. (**Note**: SHEETROCK Brand Gypsum Liner Panel floor underlayment is not intended for use in areas subject to prolonged contact with water—e.g., gang showers, etc. For applications in these areas, substitute a double layer of 1/2″ DUROCK Brand Exterior Cement Board for gypsum liner panels to achieve comparable fire- and sound-rated performance).

B **Cavity:** Install 3″ thick THERMAFIBER SAFB to fit snugly between all floor joists. Support each batt with four spring steel wire rods (0.087″ dia. typical) uniformly spaced to hold the batts approximately 1″ above the bottom of the joists. Butt ends tightly and fill all voids.

C **Ceiling:** Apply RC-1 Resilient Channels (or equivalent) 16″ o.c. perpendicular to joists and fastened with 1-7/8″ Type S screws. Attach base layers of 5/8″ SHEETROCK Brand Gypsum Panels, FIRECODE C Core, perpendicular to channels with 1″ Type S screws 16″ o.c. at channels, 8″ o.c. at panel ends. Attach face layers with 1-5/8″ Type S screws 8″ o.c. at channels, with 1-1/2″ Type G screws 8″ o.c. at panel ends, staggering screws 4″ from screws in base layer. Treat joints and fasteners with SHEETROCK Brand joint system. Seal perimeter with SHEETROCK Brand Acoustical Sealant.

3.3.4 Gypsum Panel Erection—Walls

Apply resilient channel per 3.3.1. Apply gypsum panels of maximum practical length with long dimension parallel to resilient channel and fastened with 1″ Type S screws spaced 12″ o.c. along channels. Center horizontal abutting edges over screw flange of channel. Where channel resiliency makes screw placement difficult, the next longer screw may be used, but do not drive screw directly over stud. For direct attachment, fasten panels to wood studs with 6d nails 8″ o.c.

For two-layer application of gypsum panels, apply base layer perpendicular to resilient channels and attach to channels with 1″ Type S screws spaced 24″ o.c. and to wood studs with 1-1/4″ Type W screws 16″ o.c. Apply face layer with long dimension perpendicular to long edges of base layer and fasten with 1-5/8″ Type S screws 16″ o.c.

3.4 Wall Furring Systems

3.4.1 Single-Layer Application—Direct Attachment

Space suitable wood furring strips 16″ o.c. and attach to masonry walls. Apply gypsum panels of maximum practical length with long dimension perpendicular to furring strips. Fasten panels with 1-1/4″ Type W screws spaced 16″ o.c. Apply foil-back panels with foil side against furring. Where there is a possibility of water penetration through exterior walls, install an asphalt felt strip between furring strips and wall.

3.4.2 Mechanical Application—Z-Furring Channels

Erect insulation vertically on interior of masonry and concrete walls and hold in place with Z-Furring Channels spaced 24″ o.c. Except at exterior corners, attach narrow flanges of furring channels to wall with concrete stub nails or power-driven fasteners spaced 24″ o.c. At exterior corners, attach wide flange of furring channel to wall with short flange extending beyond corner. On adjacent wall surface, screw attach short flange of furring channel to web of attached channel. Start from this furring channel with a standard width insulation panel and continue in regular manner. At interior corners, space second channel no more than 12″ from corner and cut insulation to fit. Hold mineral-fiber insulation in place until gypsum panels are installed with 10″ long staple field-fabricated from 18 ga. tie wire and inserted through slot in channel. Apply wood blocking around window and door openings and as required for attachment and support of fixtures and furnishings.

Apply gypsum panels parallel to channels with edge joints occurring over channels. Use no end joints in single-layer application. Attach gypsum panels with 1″ Type S screws spaced 16″ o.c. in field of panels and at edges, and with 1-1/4″ Type S screws spaced 12″ o.c. at exterior corners. For double-layer application, apply base layer parallel to channels, face layer either perpendicular or parallel to channels with vertical joints offset at least one channel. Attach base layer with screws 24″ o.c. and face layer with 1-5/8″ screws 16″ o.c.

3.5 Gypsum Sheathing Application

Apply 24″ wide sheathing horizontally with tongue edge up. Install supplementary bracing as required by applicable code. Fasten sheathing with nails spaced 8″ o.c. along each stud.

Apply 48″ wide sheathing vertically with bottom edge bearing on foundation or subfloor. Install supplementary bracing (and adhesive) as required by applicable code. Fasten sheathing to studs and plates with nails 8″ o.c.

3.6 Exterior Ceilings and Soffits

Apply SHEETROCK Brand Exterior Gypsum Ceiling Board (perpendicular to supports) (parallel to supports) with end joints over supports and with 1/16″ to 1/8″ space between butted ends of boards. Use maximum practical lengths to minimize end joints. Fasten boards to supports with screws spaced 12″ o.c. or nails spaced 8″ o.c. Where specified, cover joints with wood battens securely fastened to framing. Finish joints, trim and fasteners with SHEETROCK Brand Setting-Type (DURABOND) or Lightweight Setting-Type (EASY SAND) Joint Compound applied according to directions.

3.7 Joint System

3.7.1 Prefill Application

A Mix SHEETROCK Brand Setting-Type (DURABOND) or Lightweight Setting-Type (EASY SAND) Joint Compound according to directions on bag. Do not overmix, or use extremely cold water or cold joint compound.

B Prefill all “V” grooves formed by abutting tapered eased edges of SHEETROCK Brand Gypsum Panels, SW Edge, with SHEETROCK Brand Setting-Type (DURABOND) or Lightweight Setting-Type (EASY SAND) Joint Compound using a flexible 5″ or 6″ joint finishing knife or Ames Pre-Fill Tool. Fill “V” joint flush and wipe off excess compound beyond the “V” groove, leaving a clear depression to receive tape. Allow prefill to harden prior to the next application (tape or embedding coat).

3.7.2 SHEETROCK Brand Joint Tape

A Mix joint compound in strict accordance with manufacturer’s recommendations.

B Apply joint compound in a thin uniform layer to all joints and angles to be reinforced. Immediately apply SHEETROCK Brand Joint Tape centered over joint and seated into compound. Sufficient compound—approx. 1/64″ to 1/32″—must remain under the tape to provide proper bond. Follow immediately with a thin skim coat to embed tape, but not to function as a second coat. Fold and embed tape properly in all interior angles to provide a true angle. The tape or embedding coat must be thoroughly dry prior to application of second coat. (Exception: DURABOND Setting-Type and EASY SAND Lightweight Setting-Type Joint Compounds need only have hardened prior to application of next coat.)

C Apply second coat of joint compound over embedding coat, filling panel taper flush with surface; cover tape and feather out at least 2″ beyond first coat. On joints with no taper, cover the tape and feather out at least 4″ on either side of tape. Allow second coat to dry thoroughly prior to application of finish coat. (Exception: DURABOND Setting-Type and EASY SAND Lightweight Setting-Type Joint Compounds need only have hardened prior to second coat application.)

D Spread finish coat evenly over and extend at least 2″ beyond second coat on all joints and feather to a smooth uniform finish. Do not allow finished joint to protrude beyond plane of the surface. Where necessary, sand lightly between coats and following the final application of compound to provide a smooth surface ready for decoration. When sanding, take care not to roughen face paper.

3.7.3 SHEETROCK Brand Fiberglass Drywall Tape

A Mix joint compound in strict accordance with manufacturer's recommendations.

B Center and apply SHEETROCK Brand Fiberglass Drywall Tape directly over joint, pressing tape firmly so that it adheres evenly to surface. To eliminate wrinkles and ensure maximum bond, press entire length of taper with drywall knife. Avoid overlapping tape at intersections. Cut tape with drywall knife.

C Cover with a layer of SHEETROCK Brand Setting-Type (DURABOND) or Lightweight Setting-Type (EASY SAND) Joint Compound, forcing compound through the tape with a drywall knife/trowel to completely fill and level the joint. Failure to completely fill the joint may result in cracking. Let dry and sand lightly as required.

D Apply second coat of SHEETROCK Brand Setting-Type (DURABOND) or Lightweight Setting-Type (EASY SAND) Joint Compound or SHEETROCK Brand Drying-Type Joint Compound (powder or ready mixed), feathering approximately 2″ beyond first coat. Let dry and sand lightly as required.

3.7.4 Finishing Fasteners

A Apply a setting-type, all-purpose, or lightweight all-purpose compound to fastener depressions as the first coat. Follow with a minimum of two additional coats of topping or all-purpose compound, leaving all depressions level with the surface. (Exception: Setting-type and lightweight all-purpose joint compounds need only one additional coat.)

3.8 SHEETROCK Brand Paper Faced Drywall Metal Bead and Trim

3.8.1 Application and Finishing

A Apply compound to both sides of corner, extending 2″ on each side for outer corners, 1-1/2″ for inside corners. Cut bead to desired length; align tightly to ceiling and press firmly with fingers along length of corner to set. Do not bend bead. Run taping knife over corner at a 45° angle with even pressure. Remove excess compound using knife to eliminate air bubbles under paper. Allow to dry.

B For outer corners, apply another coat of compound to both sides, feathering out 5″-6″ on each side. Let dry; sand lightly as necessary. For inner corners, apply fill coat to one side, feathering out 1″. Let dry. Apply fill coat to other side using same procedure. Let dry. Sand lightly where necessary.

C For outer corner, apply finishing coat, feathering 8″ from nose of bead. Draw knife along one side of bead with one edge resting on nose of bead and other on surface of wallboard. Repeat for other side. Let dry. Sand and prime. For inner corners, apply finishing coat to one side, feathering 1″ past previous coat. Let dry. Apply finishing coat to other side. Let dry. Sand and prime.

3.9 Other Bead and Trim

3.9.1 Installation

A Reinforce all vertical and horizontal exterior corners with corner bead fastened with nails or 9/16″ galvanized staples 9″ o.c. on both flanges along entire length of bead.

B Where partition or ceiling terminates against masonry or other dissimilar material, apply metal trim over gypsum panel edge and fasten with nails or galvanized staples 9″ o.c.

3.9.2 Finishing

A Apply first coat to all bead and trim and properly feather out from ground to plane of surface. Compound must thoroughly dry prior to application of second coat (exception: SHEETROCK Brand Setting-Type [DURABOND] and Lightweight Setting-Type [EASY SAND] Joint Compounds need only have hardened prior to application of next coat.)

B Apply second coat in same manner as first coat, extending compound slightly beyond face of panel. Compound must be thoroughly dry prior to application of finish coat (exception: Setting-Type joint compounds need only have hardened prior to application of next coat.)

C Apply finish coat to all bead and trim, extending compound slightly beyond the second coat and properly feathering from ground to plane or surface (exception: Only two coats of SHEETROCK Brand Setting-Type [DURABOND] or Lightweight Setting-Type [EASY SAND] Joint Compound or SHEETROCK Brand Lightweight All Purpose Joint Compound Ready Mixed [PLUS 3] are needed.) When dry, sand finish as necessary to provide a flat smooth surface ready for decoration. When sanding, take care not to roughen face paper.

3.10 Screws

Power-drive at least 3/8″ from edges or ends of gypsum panels to provide uniform dimple 1/32″ deep.

3.11 Control Joints

Break gypsum panels and resilient channels behind joint and back by double supports. Apply acoustical sealant to fill gap and attach control joint to face layer with nails or 9/16″ deep galvanized staples spaced 6″ o.c. on both flanges along entire length of joint.

Metric Conversion

The table below provides metric equivalents for the dimensions of United States Gypsum Company products. "Soft" conversions merely apply a conversion factor that translates feet and inches (according to which the products were manufactured) into metric units; "hard" metric measurements are given for products actually manufactured in metric sizes.

Metric Equivalents

Dimension	Conversion Type(1)	Ft./In.	mm(2)
SHEETROCK Brand Gypsum Panels			
Thickness	Soft	1/4″	6
		3/8″	10
		1/2″	13
		5/8″	16
		3/4″	19
		1″	25
Width	Hard	24″	600
		48″	1200
Length	Hard	8′	2400
		10′	3000
		12′	3600
Steel Stud Framing			
Thickness (gauge)	Soft	.0179 (25)	.45
		.0270 (22)	.69
		.0329 (20)	.84
Depth	Soft	1-5/8″	41
		2-1/2″	64
		3-1/2″	89
		3-5/8″	92
		4″	102
Length	Hard	8′	2400
		10′	3000
		12′	3600
THERMAFIBER Insulation			
Thickness	Soft	1″	25
		1-1/2″	38
		2″	51
		3″	76
		4″	102
		6″	152
Width	Hard	16″	400
		24″	600
Length	Hard	48″	1200

(1) Conversion Type: "Soft" is metric relabeling with no physical change of dimension; "hard" is a physical change to the metric dimension shown.
(2) Conversion factors: Inches x 25.4 = mm; Feet x 304.8 = mm.
Notes: Availability: Items above are not stocked in metric lengths or widths. Minimum quantity orders may be required. Leadtime should be determined; upcharges may apply. Geographic availability may vary and should be verified for the project location.
Lengths: Shown on SHEETROCK Brand Gypsum Panels and steel stud framing for illustration purposes only.
Framing Spacing: 16″ o.c. converts to 400 mm o.c.; 24″ converts to 600 mm o.c.

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800 950.3839

Metric Specifications
USG Corporation, through its operating subsidiaries, will provide metric conversions on its products and systems to help specifiers match metric design sizes. In addition, some products are available in metric dimensions from selected manufacturing plants. Refer to SA100 *Construction Selector* for additional information and a Table of Metric Equivalents.

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Note
All products described here may not be available in all geographic markets. Consult your local sales office or representative for information.

Safety First!
Follow good safety and industrial hygiene practices during handling and installing of all products and systems. Take necessary precautions and wear the appropriate personal protective equipment as needed. Read material safety data sheets and related literature on products before specification and/or installation.

USG

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