FABRAL
METAL WALL AND ROOF SYSTEMS

Industrial Panel Test Booklet

Architectural Building Systems

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NOTE: The test reports in this booklet are for through-fastened panels only. Fabral's standing seam panels each have their own manuals. Refer to the respective standing seam panel manual for test values and ratings.

I-500 (98-32-643) 8/07 APC

a Euramax company

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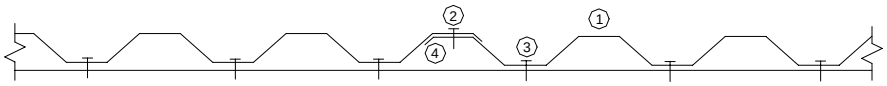
FABRAL
METAL WALL AND ROOF SYSTEMS

Air and Water Infiltration

ARCHITECTURAL-COMMRCIAL ROOFING & SIDING

Fabral has conducted air and water infiltration testing on several of its insulated and uninsulated systems through Dynatherm Engineering, an independent testing laboratory. The following illustrations show the assemblies as tested and the corresponding values. The air and water infiltration tests were performed in accordance with ASTM E 283, ASTM E 331, and NAAMM Interim Standard TM-1-68 T at the specified pressure differentials.

HEFTI-RIB® TEST RESULTS



1. Hefti-Rib panel
2. Hefti-Rib side laps (caulked)
3. #12-14 x 1" self-drilling screw
4. #14 x 1" stitch screw

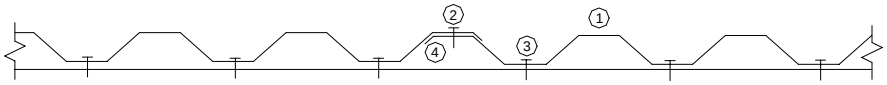
AIR INFILTRATION

Pressure differential (psf)	Air infiltration
20.00	None

WATER PENETRATION*

Pressure differential (psf)	Water penetration for 15 minutes
20.00	None

HEFTI-RIB® I TEST RESULTS



1. Hefti-Rib panel
2. Hefti-Rib side laps (caulked)
3. #12-14 x 1" self-drilling screw
4. #14 x 1" stitch screw

AIR INFILTRATION

Pressure differential (psf)	Air infiltration
1.56	None
6.24	None
20.00	None

WATER PENETRATION*

Pressure differential (psf)	Water penetration for 15 minutes
4.00	None
8.00	None
20.00	None

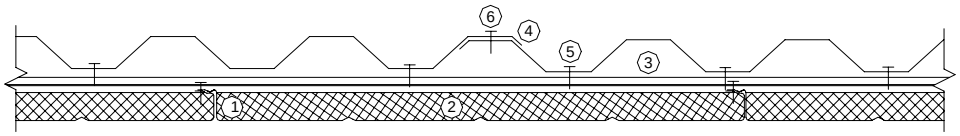
* Test was conducted at 5 gal. /hr.ft.^{2}.

Air and Water Infiltration

ARCHITECTURAL-COMMRCIAL ROOFING & SIDING

Fabral has conducted air and water infiltration testing on several of its insulated and uninsulated systems through Dynatherm Engineering, an independent testing laboratory. The following illustrations show the assemblies as tested and the corresponding values. The air and water infiltration tests were performed in accordance with ASTM E 283, ASTM E 331, and NAAMM Interim Standard TM-1-68 T at the specified pressure differentials.

HEFTI-RIB®/LP-15 TEST RESULTS



1. Liner side laps (caulked)
2. Insulation (1 1/2" x 1.65 pcf fiberglass)
3. Subgirt (18 ga. hat section)
4. Hefti-Rib side laps (caulked)
5. #12-14 x 1" self-drilling screw
6. #14 x 1" stitch screw

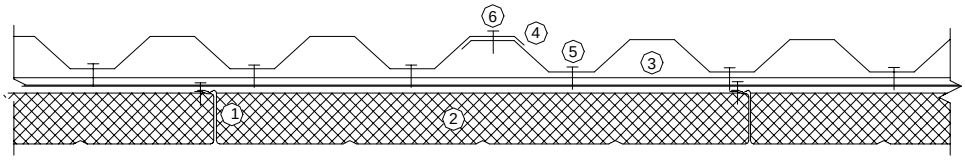
AIR INFILTRATION

Pressure differential (psf)	Air infiltration (cmf/ft.^{2})
1.57	None
6.24	None

WATER PENETRATION*

Pressure differential (psf)	Water penetration for 15 minutes
4.00	None
8.00	None

HEFTI-RIB®/LP-25 TEST RESULTS



1. Liner side laps (caulked)
2. Insulation (2" x 1.65 pcf fiberglass)
3. Subgirt (18 ga. hat section)
4. Hefti-Rib side laps (caulked)
5. #12-14 x 1" self-drilling screw
6. #14 x 1" stitch screw

AIR INFILTRATION

Pressure differential (psf)	Air infiltration (cmf/ft.^{2})
1.57	None
6.24	None

WATER PENETRATION*

Pressure differential (psf)	Water penetration for 15 minutes
4.00	None
8.00	None

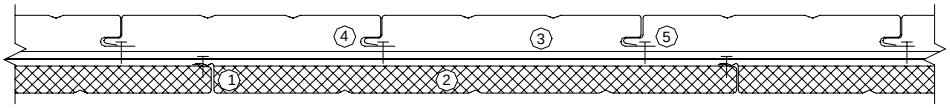
* Test was conducted at 5 gal. /hr.ft.^{2}.

Air and Water Infiltration

ARCHITECTURAL-COMMRCIAL ROOFING & SIDING

Fabral has conducted air and water infiltration testing on several of its insulated and uninsulated systems through Dynatherm Engineering, an independent testing laboratory. The following illustrations show the assemblies as tested and the corresponding values. The air and water infiltration tests were performed in accordance with ASTM E 283, ASTM E 331, and NAAMM Interim Standard TM-1-68 T at the specified pressure differentials.

SELECT SERIES 12(CFP 12)^{TM}/LP-15 TEST RESULTS



1. Liner side laps (caulked)
2. Insulation (1 1/2" x 1.65 pcf fiberglass)
3. Subgirt (18 ga. hat section)
4. CFP 12 side laps (caulked)
5. #12-14 x 1" self-drilling screw

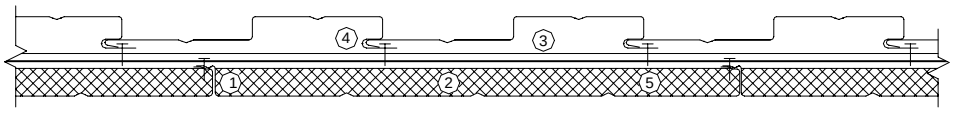
AIR INFILTRATION

Pressure differential (psf)	Air infiltration (cmf/ft.^{2})
20.00	0.0026

WATER PENETRATION*

Pressure differential (psf)	Water penetration for 15 minutes
3.90	None

SELECT SERIES 6(CFP 6)^{TM}/LP-15 TEST RESULTS



1. Liner side laps (caulked)
2. Insulation (1 1/2" x 1.65 pcf fiberglass)
3. Subgirt (18 ga. hat section)
4. CFP 6 side laps (caulked)
5. #12-14 x 1" self-drilling screw

AIR INFILTRATION

Pressure differential (psf)	Air infiltration (cmf/ft.^{2})
1.56	0.0078
6.24	0.0140

WATER PENETRATION*

Pressure differential (psf)	Air infiltration (cmf/ft.^{2})
4.00	None
8.00	None

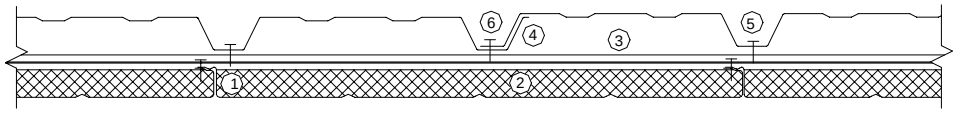
* Test was conducted at 5 gal. /hr.ft.^{2}.

Air and Water Infiltration

ARCHITECTURAL-COMMRCIAL ROOFING & SIDING

Fabral has conducted air and water infiltration testing on several of its insulated and uninsulated systems through Dynatherm Engineering, an independent testing laboratory. The following illustrations show the assemblies as tested and the corresponding values. The air and water infiltration tests were performed in accordance with ASTM E 283, ASTM E 331, and NAAMM Interim Standard TM-1-68 T at the specified pressure differentials.

ULTRA-RIB®I/LP-15 TEST RESULTS



1. Liner side laps (caulked)
2. Insulation (1 1/2" x 1.65 pcf fiberglass)
3. Subgirt (18 ga. hat section)
4. Ultra-Rib I side laps (caulked)
5. #12-14 x 1" self-drilling screw
6. #14 x 1" stitch screw

AIR INFILTRATION

Pressure differential (psf)	Air infiltration (cmf/ft.^{2})
1.57	None
6.24	None

WATER PENETRATION*

Pressure differential (psf)	Water penetration for 15 minutes
4.00	None
8.00	None

* Test was conducted at 5 gal. /hr.ft.^{2}.

Fabral has conducted air and water infiltration testing on its Décor Flush panel at Architectural Testing, Inc., an independent testing laboratory. The air and water infiltration tests were performed in accordance with ASTM E 283 and ASTM E 331 at the specified pressure differentials.

DÉCOR FLUSH TEST RESULTS

1. Decor Flush Panel w/ sidelaps caulked
2. 2 x 4 wood purlin @ 4ft. o.c.
3. #12-14 x 1" Woodgrip screws @ purlins

AIR INFILTRATION

Pressure differential (psf)	Air infiltration (cmf/ft.^{2})
1.57	< .01
6.24	< .01

WATER PENETRATION*

Pressure differential (psf)	Water penetration for 15 minutes
20.0	No Leakage

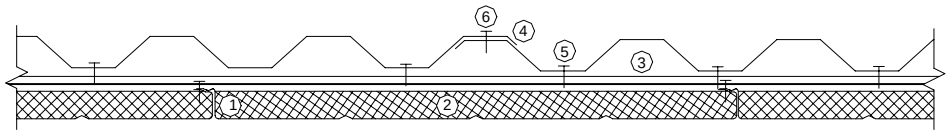
*Test was conducted at 5 gal. /hr.ft.^{2}.

Thermal Transmittance

ARCHITECTURAL-COMMRCIAL ROOFING & SIDING

Fabral has conducted thermal testing on several of its insulated systems through Dynatherm Engineering, an independent testing laboratory. The following illustrations show the assemblies as tested and the corresponding R-values. All tests were preformed in accordance with ASTM C 236 hot-box apparatus.

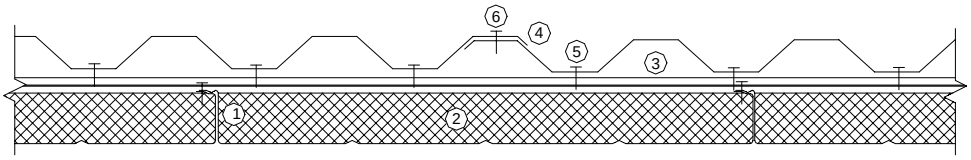
HEFTI-RIB®/LP-15 TEST RESULTS



1. Liner side laps (caulked)
2. Insulation (1 1/2" x 1.65 pcf fiberglass)
3. Subgirt (18 ga. hat section)
4. Hefti-Rib side laps (caulked)
5. #12-14 x 1" self-drilling screw
6. #14 x 1" stitch screw

TEST RESULTS	
Thermal resistance (hr.ft.²°F/BTU) as tested	7.35
Thermal resistance (hr.ft.²°F/BTU) still air both sides	7.35
Thermal resistance (hr.ft.²°F/BTU) corrected to ASHRAE winter design	6.85

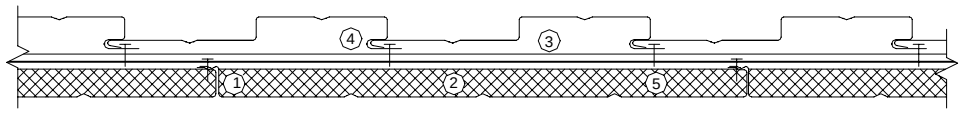
HEFTI-RIB®/LP-25 TEST RESULTS



1. Liner side laps (caulked)
2. Insulation (2" x 1.65 pcf fiberglass)
3. Subgirt (18 ga. hat section)
4. Hefti-Rib side laps (caulked)
5. #12-14 x 1" self-drilling screw
6. #14 x 1" stitch screw

TEST RESULTS	
Thermal resistance (hr.ft.²°F/BTU) as tested	11.58
Thermal resistance (hr.ft.²°F/BTU) corrected to ASHRAE winter design (painted interior)	10.38
Thermal resistance (hr.ft.²°F/BTU) corrected to ASHRAE winter design (unpainted interior)	10.67

SELECT SERIES 6(CFP 6)™/LP-15 TEST RESULTS



1. Liner side laps (caulked)
2. Insulation (1 1/2" x 1.65 pcf fiberglass)
3. Subgirt (18 ga. hat section)
4. CFP 6 side laps (caulked)
5. #12-14 x 1" self-drilling screw

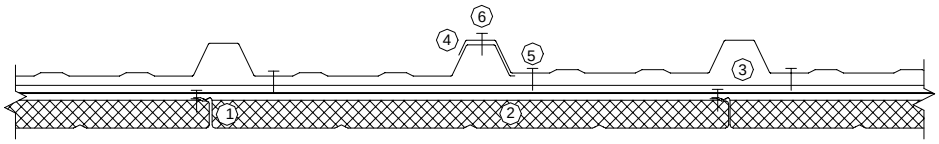
TEST RESULTS	
Thermal resistance (hr.ft.²°F/BTU) as tested	7.35
Thermal resistance (hr.ft.²°F/BTU) corrected to ASHRAE winter design	7.00

Thermal Transmittance

ARCHITECTURAL-COMMRCIAL ROOFING & SIDING

Fabral has conducted thermal testing on several of its insulated systems through Dynatherm Engineering, an independent testing laboratory. The following illustrations show the assemblies as tested and the corresponding R-values. All tests were preformed in accordance with ASTM C 236 hot-box apparatus.

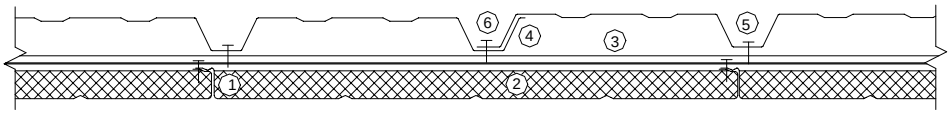
ULTRA-RIB®/LP-15 TEST RESULTS



1. Liner side laps (caulked)
2. Insulation (1 1/2" x 1.65 pcf fiberglass)
3. Subgirt (18 ga. hat section)
4. Ultra-Rib side laps (caulked)
5. #12-14 x 1" self-drilling screw
6. #14 x 1" stitch screw

TEST RESULTS	
Thermal resistance (hr.ft.²°F/BTU) as tested	7.30
Thermal resistance (hr.ft.²°F/BTU) corrected to ASHRAE winter design (painted interior)	7.35
Thermal resistance (hr.ft.²°F/BTU) corrected to ASHRAE winter design (unpainted interior)	6.85

ULTRA-RIB®I/LP-15 TEST RESULTS



1. Liner side laps (caulked)
2. Insulation (1 1/2" x 1.65 pcf fiberglass)
3. Subgirt (18 ga. hat section)
4. Ultra-Rib I side laps (caulked)
5. #12-14 x 1" self-drilling screw
6. #14 x 1" stitch screw

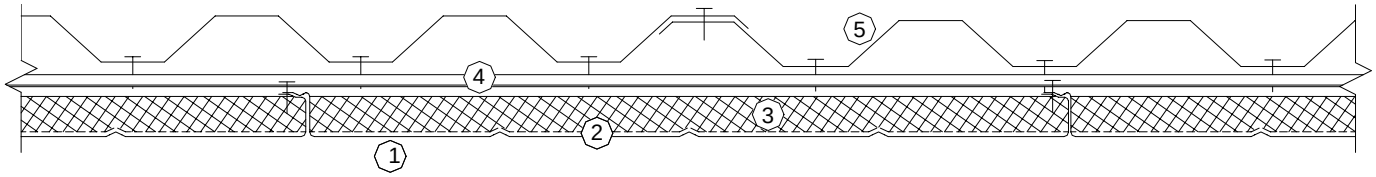
TEST RESULTS	
Thermal resistance (hr.ft.²°F/BTU) as tested	7.30
Thermal resistance (hr.ft.²°F/BTU) corrected to ASHRAE winter design (painted interior)	7.35
Thermal resistance (hr.ft.²°F/BTU) corrected to ASHRAE winter design (unpainted interior)	6.85

Acoustical Panel Systems

ARCHITECTURAL-COMMRCIAL ROOFING & SIDING

Fabral has conducted acoustical tests on its liner panel systems through Riverbank Acoustical Laboratories. The Sound Absorption Test Method conforms explicitly with the requirements of the American Society for Testing and Materials' (ASTM) Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method ANSI/ASTM C 423-77. These tests were in conformance with ASTM E 90-75 and E 413-73.

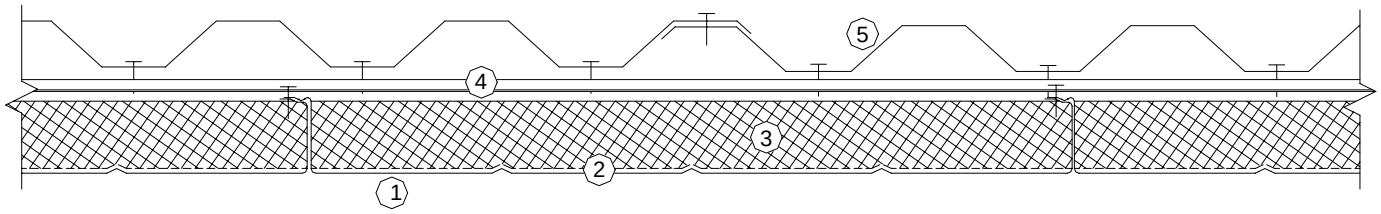
ULTRA-RIB®/LP-15 TEST RESULTS



1. 22 ga. steel LP-15, perforated $^{1}/_{8}$" diameter holes on $^{3}/_{8}$" centers.
2. Plastic encapsulated netting
3. Fiberglass insulation (1½" x 1.65 pcf density) wrapped in 4 mil PVC
4. $^{3}/_{8}$" 18 ga. subgirt
5. 22 ga. steel Hefti-Rib

TEST RESULTS	
Noise reduction coefficient (NRC)	0.90 Hz
Sound transmission class	27

ULTRA-RIB®I/LP-15 TEST RESULTS



1. 22 ga. steel LP-25, perforated $^{1}/_{8}$" diameter holes on $^{3}/_{8}$" centers.
2. Plastic encapsulated netting
3. Fiberglass insulation (2½" x 1.65 pcf density) wrapped in 4 mil PVC
4. $^{3}/_{8}$" 18 ga. subgirt
5. 22 ga. steel Hefti-Rib

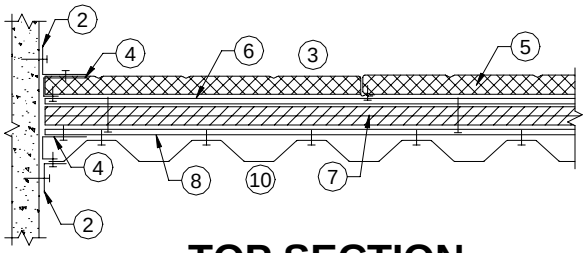
TEST RESULTS	
Noise reduction coefficient (NRC)	0.95 Hz
Sound transmission class	33

Notes:
The noise reduction coefficient describes the amount of sound absorption in a room.
A rating of 1 would be complete absorption while a rating of 0 would be no absorption.
Sound transmission class refers to the amount of sound reduction through a wall.
The greater the rating, the lesser the amount of sound transmitted through a wall.

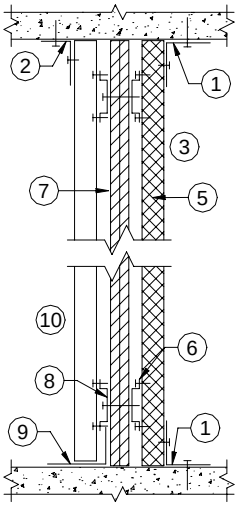
Fire Resistant Walls

ONE-HOUR FIREWALL

Fabral has conducted one-hour firewall tests on the non-bearing wall assembly described below. This assembly is also listed in the Underwriters Laboratories *Fire Resistance Directory* as Design No. U646.



TOP SECTION



SIDE SECTION

1. Steel Supports: 3" x 3" x ¼" steel angles attached to masonry with $^{3}/_{8}$" x 2" steel bolts with expansion shields.

2. Flashing Angles: 2" x 3" x 18 ga. coated steel. Short leg fastened to masonry or wall with #14 x 1 ¾" long hex washer head sheet metal screws and split steel inserts spaced 18" o.c. Long leg of sides and top flashing angles attached to panels with #14 x ¾" long hex-head sheet metal screws spaced 12" o.c.

3. Steel Liner Panels: Nominal 24" wide x 1 ½" or 2 ½" deep. Minimum 24 ga. attached to top and bottom support angles with #14 x 1" hex-head self-drilling steel screws with a separate 5/8" diameter steel washer and bonded neoprene sealing washer spaced 12" o.c. Adjacent panels fastened together with the same fastener spaced 36" o.c. beginning 3" from top and bottom of each sheet. Fabral LP-15 or LP-25.

4. Reinforcing Channel: 18 ga. steel channel 1½" deep with 1" and 3" legs. Used to support free end of final liner and facing panels. Short leg attached to subgirts on liner side as described in Item 6. Long leg attached along both legs of subgirts on facing side with #14 x 1" long hex-washer-head self-tapping or self-drilling steel screws.

5. Insulation (UL listed) (optional): nominal 24" x 48" x 1½" or 2½". Inserted in liner cavity with horizontal joints in adjacent cavities staggered.

6. Subgirts: hat-shaped ½" deep x 3½" wide with $^{5}/_{8}$" legs, 18 ga. steel. Attached along both legs to lips of liner panels and to reinforcing channel with #12 x 1" long hex-washer-head self-drilling steel screws. Spaced 48" o.c. (maximum) and 3" from steel support (Item 1).

7. Wallboard, Gypsum (UL listed): two layers nominal $^{5}/_{8}$" thick (each) x 48" wide sheets applied vertically. Joints between adjacent layers staggered 12" vertically and 48" horizontally. First and second layers attached to subgirts with 1 $^{5}/_{8}$" long Phillips head self-drilling steel screws located alternately 12" from vertical edges in each sheet for the first layer and 6" from the vertical edge in each sheet for the second layer.

8. Subgirts: same as Item 6. Place over wallboard with one leg located in line with the center of the subgirts on the opposite side and attached through the wallboard to the first set of subgirts with #12 x 2$^{3}/_{8}$" hex-head self-drilling steel screws spaced 24" o.c.

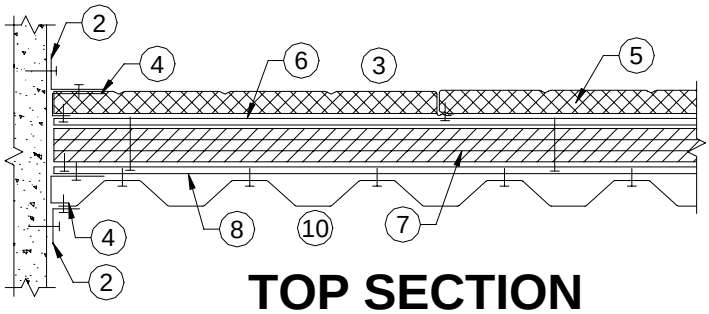
9. Bottom Flashing Angle: 4" x 2¼", placed between the bottom subgirt and the wallboard and secured in position with the subgirt fastener. Material and minimum thickness same as wall facing panels.

10. Facing Panels: metal-facing panels of various shapes supplied in widths 12 – 48" nominal. Attached to subgirts with #12-14 x 1" long hex-head self-drilling steel screws with ½" diameter steel and neoprene washer or #14 x 1" hex-head self-tapping screws with $^{5}/_{8}$" diameter steel and neoprene washers, spaced horizontally a minimum of 7.2" and a maximum of 12" o.c. Vertical joints to be stitched together at 18" o.c. with #12 x $^{5}/_{8}$" steel self-drilling screws with steel and neoprene washers or #14 x ¾" hex-head steel sheet metal screws with steel and neoprene washers or #14 x ¾" hex-head steel sheet metal screws with steel and neoprene washers. End panels and flashings to be attached in conjunction to reinforcing channel at 12" o.c. with the same type fasteners used to stitch vertical joints. Minimum thickness to be 24 ga. steel. Fabral: Hefti-Rib I, Ultra-Rib I, 4" Rib, Mighti-Rib PBR, $^{7}/_{8}$" Corrugated, V-Beam, CFP 6, CFP 12.

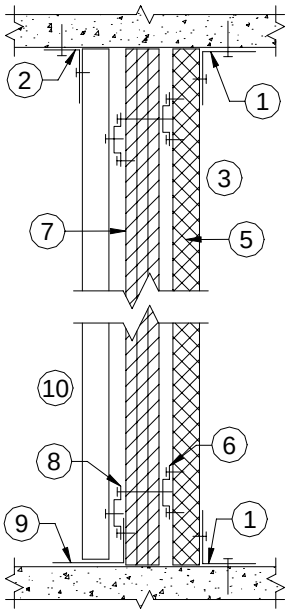
Fire Resistant Walls

TWO-HOUR FIREWALL

Fabral has conducted two-hour firewall tests on the non-bearing wall assembly described below. This assembly is also listed in the Underwriters Laboratories *Fire Resistance Directory* as Design No. U642.



TOP SECTION



SIDE SECTION

1. Steel Supports: 3” x 3” x ¼” steel angles attached to masonry with $^{3}/_{8}$” x 2” steel bolts with expansion shields.

2. Flashing Angles: 2” x 3” x 18 ga. coated steel. Short leg fastened to wall with #14 x 1 ¾” long hex washer head sheet metal screws and split steel inserts spaced 18” o.c. Long leg of sides and top flashing angles attached to panels with #14 x ¾” long hex-head sheet metal screws spaced 12” o.c.

3. Steel Liner Panels: Nominal 24” wide x 1½” or 2½” deep. Minimum 22 ga. attached to top and bottom support angles with #14 x 1” hex-head self-tapping steel screws with a separate $^{5}/_{8}$” diameter steel washer and bonded neoprene sealing washer spaced 12” o.c. Adjacent panels fastened together with the same fastener spaced 36” o.c. beginning 3” from top and bottom of each sheet. Fabral LP-15 or LP-25.

4. Reinforcing Channel: 18 ga. steel channel 1½” deep with 1” and 3” legs. Used to support free end of final liner and facing panels. Short leg attached to subgirts on liner side as described in Item 6. Long leg attached along both legs of subgirts on facing side with #14 x 1” hex-washer-head self-tapping or self-drilling steel screws.

5. Insulation (UL listed): nominal 24” x 48” x 1½” or 2½”. Inserted in liner cavity with horizontal joints in adjacent cavities staggered.

6. Subgirts: hat-shaped $^{3}/_{8}$” deep x 3” wide with ¾” legs, 18 ga. steel. Attached along both legs to lips of liner panels and to reinforcing channel with #14 x 1” hex-washer-head self-tapping or self-drilling steel screws. Spaced 48” o.c. maximum and 3” from top and bottom of wall.

7. Wallboard, Gypsum (UL listed): three layers nominal $^{5}/_{8}$” thick (each) x 48” wide sheets applied vertically. Joints between adjacent layers staggered 12” vertically and horizontally. First and second layers attached to subgirts with #12 x 1 $^{5}/_{8}$” long Phillips head self-drilling steel screws. Third layer attached to first and second layer with 1½” long Phillips head steel wallboard screws spaced 12” o.c. vertically. Screws located alternately 12” from vertical edges in each sheet for the first layer and 6” from the vertical edge in each sheet for the second and third layers and ½” from horizontal joints.

8. Subgirts: same as Item 6. Place over wallboard with one leg located in line with the center of the subgirts on the opposite side and attached through the wallboard to the first set of subgirts with #14 x 2½” hex-head self-tapping steel screws spaced 24” o.c.

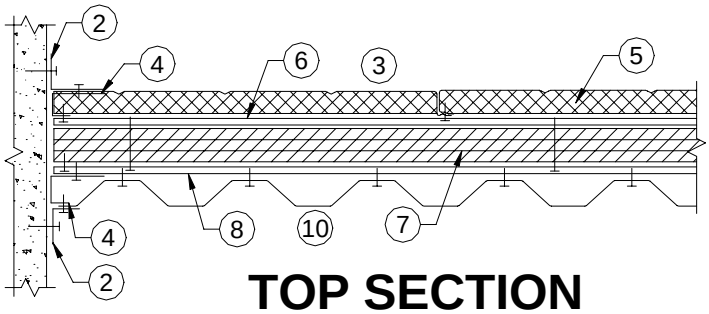
9. Bottom Flashing Angle: 4” x 2¼”, placed between the bottom subgirt and the wallboard and secured in position with the subgirt fastener. Material and minimum thickness same as wall facing panels.

10. Facing Panels: metal-facing panels of various shapes supplied in widths 12 – 48” nominal. Attached to subgirts with #12-14 x 1” hex-head self-drilling steel screws with ½” diameter steel and neoprene washer or #14 x 1” hex-head self-tapping screws with $^{5}/_{8}$” diameter steel and neoprene washers, spaced horizontally a minimum of 7.2” and a maximum of 12” o.c. Vertical joints to be stitched together at 18” o.c. with #12 x $^{5}/_{8}$” steel self-drilling screws with steel and neoprene washers or #14 x ¾” hex-head steel sheet metal screws with steel and neoprene washers or #14 x ¾” hex-head steel sheet metal screws with steel and neoprene washers. End panels and flashings to be attached in conjunction to reinforcing channel at 12” o.c. with the same type fasteners used to stitch vertical joints. Minimum thickness to be 24 ga. steel or 0.032” aluminum, except when on fireside where minimum thickness is to be 20 ga. coated steel. Fabral: Hefti-Rib I, Ultra-Rib I, 4” Rib, Mighti-Rib PBR, $^{7}/_{8}$” Corrugated, V-Beam, Select Series 6 & 12 (CFP-6 & 12).

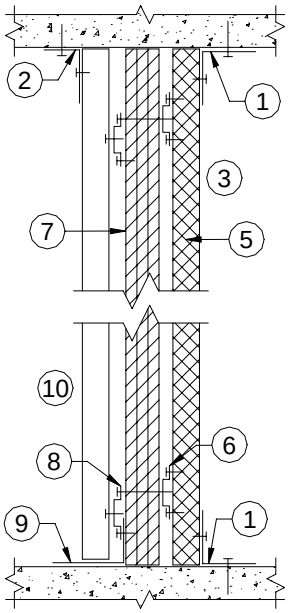
Fire Resistant Walls

THREE-HOUR FIREWALL

Fabral has conducted three-hour firewall tests on the non-bearing wall assembly described below. This assembly is also listed in the Underwriters Laboratories *Fire Resistance Directory* as Design No. U643.



TOP SECTION



SIDE SECTION

1. Steel Supports: 3" x 3" x ¼" steel angles attached to masonry with $^{3}/_{8}$" x 2" steel bolts with expansion shields.

2. Flashing Angles: 2" x 3" x 18 ga. coated steel. Short leg fastened to wall with #14 x 1 ¾" long hex washer head sheet metal screws and split steel inserts spaced 18" o.c. Long leg of sides and top flashing angles attached to panels with #14 x ¾" long hex-head sheet metal screws spaced 12" o.c.

3. Steel Liner Panels: Nominal 24" wide x 1½" or 2½" deep. Minimum 18 ga. attached to top and bottom support angles with #14 x 1" hex-head self-tapping steel screws with a separate $^{5}/_{8}$" diameter steel washer and bonded neoprene sealing washer spaced 12" o.c. Adjacent panels fastened together with the same fastener spaced 36" o.c. beginning 3" from top and bottom of each sheet. Fabral LP-15 or LP-25.

4. Reinforcing Channel: 18 ga. steel channel 1½" deep with 1" and 3" legs. Used to support free end of final liner and facing panels. Short leg attached to subgirts on liner side as described in Item 6. Long leg attached along both legs of subgirts on facing side with #14 x 1" hex-washer-head self-tapping or self-drilling steel screws.

5. Insulation* (UL listed): nominal 24" x 48" x 1½". Inserted in liner cavity with horizontal joints in adjacent cavities staggered.

6. Subgirts: hat-shaped ½" deep x 3 ½" wide with ¾" legs, 18 ga. steel. Attached along both legs to lips of liner panels and to reinforcing channel with #14 x 1" hex-washer-head self-tapping or self-drilling steel screws. Spaced 48" o.c. maximum and 3" from top and bottom of wall.

7. Wallboard, Gypsum (UL listed): four layers nominal $^{5}/_{8}$" thick (each) x 48" wide sheets applied vertically. Joints between adjacent layers staggered 12" vertically and horizontally. First and second layers attached to subgirts with #12 x 1 $^{5}/_{8}$" long Phillips head self-drilling steel screws located alternately 12" from vertical edges. Third layer attached to first and second layer with 1½" Phillips head steel wallboard screws located 9" from vertical edges and spaced vertically 24" o.c. Fourth layer attached to second and third layers with 1 ½" Phillips head steel wallboard screws located 12" from vertical edges and spaced vertically 24" o.c. alternately.

8. Subgirts: same as Item 6. Place over wallboard with one leg located in line with the center of the subgirts on the opposite side and attached through the wallboard to the first set of subgirts with #14 x 3" hex-head self-tapping steel screws spaced 24" o.c.

9. Bottom Flashing Angle: 4" x 2¼", placed between the bottom subgirt and the wallboard and secured in position with the subgirt fastener. Material and minimum thickness same as wall facing panels.

10. Facing Panels: metal facing panels of various shapes supplied in widths 12 – 48" nominal. Attached to subgirts with #12-14 x 1" hex-head self-drilling steel screws with ½" diameter steel and neoprene washer or #14 x 1" hex-head self-tapping screws with $^{5}/_{8}$" diameter steel and neoprene washers, spaced horizontally a minimum of 7.2" and a maximum of 12" o.c. Vertical joints to be stitched together at 18" o.c. with #12 x $^{5}/_{8}$" steel self-drilling screws with steel and neoprene washers or #14 x ¾" hex-head steel sheet metal screws with steel and neoprene washers or #14 x ¾" hex-head steel sheet metal screws with steel and neoprene washers. Border panels and flashings to be attached in conjunction to reinforcing channel at 12" o.c. with the same type fasteners used to stitch vertical joints. Minimum thickness to be 18 ga. coated steel. Fabral: Hefti-Rib, 4" Rib, $^{7}/_{8}$" Corrugated, V-Beam.

Fire Resistant Walls

COMPONENT REQUIREMENTS SUMMARY TABLE

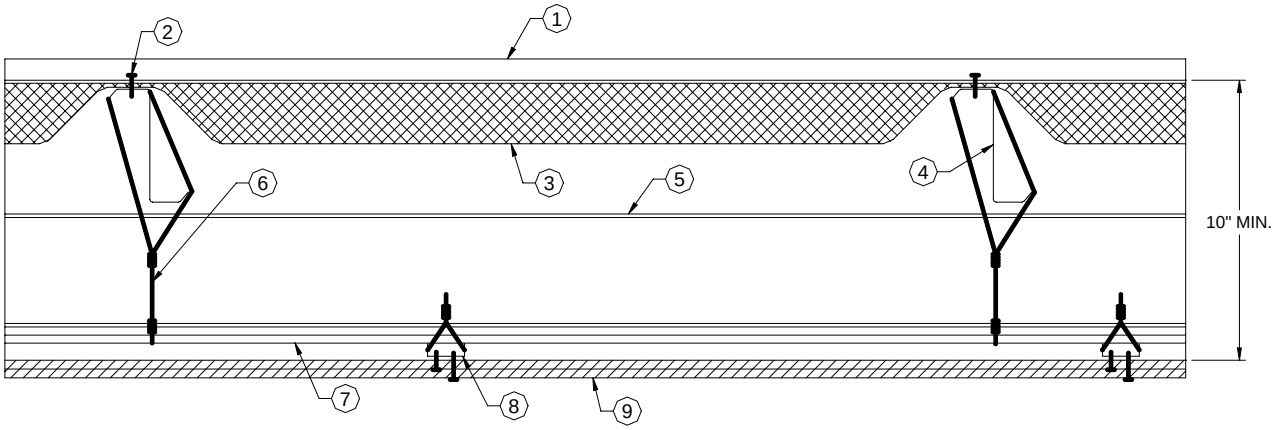
COMPONENT	METAL TYPE AND MINIMUM THICKNESS					
	ONE-HOUR FIREWALL (U646)		TWO-HOUR FIREWALL (U642)		THREE-HOUR FIREWALL (U643)	
No. of layers of 5/8" gypsum board	2		3		4	
Liner panel	Non-fire side	Fire side	Non-fire side	Fire side	Non-fire side	Fire side
LP-15	24 ga. steel	24 ga. steel	22 ga. steel	22 ga. steel	18 ga. steel	18 ga. steel
LP-25	24 ga. steel	24 ga. steel	22 ga. steel	22 ga. steel	18 ga. steel	18 ga. steel
Std. Subgirt [a]	---	---	18 ga. steel	18 ga. steel	16 ga. steel	16 ga. steel
Alternate Subgirt [b]	18 ga. steel	18 ga. steel	---	---	18 ga. steel	18 ga. steel
Exterior panel						
7/8" Corrugated	24 ga. steel	24 ga. steel	24 ga. steel or 0.032" alum.	20 ga. steel	18 ga. steel	18 ga. steel
4" Rib	24 ga. steel	24 ga. steel	24 ga. steel or 0.032" alum.	20 ga. steel	18 ga. steel	18 ga. steel
Select Series 6 (CFP 6)	24 ga. steel	24 ga. steel	24 ga. steel or 0.032" alum.	20 ga. steel	---	---
Select Series 12 (CFP 12)	24 ga. steel	24 ga. steel	24 ga. steel or 0.032" alum.	20 ga. steel	---	---
Hefti-Rib	24 ga. steel	24 ga. steel	24 ga. steel or 0.032" alum.	20 ga. steel	18 ga. steel	18 ga. steel
Mighti-Rib PBR	24 ga. steel	24 ga. steel	24 ga. steel or 0.032" alum.	20 ga. steel	---	---
Ultra-Rib	24 ga. steel	24 ga. steel	24 ga. steel or 0.032" alum.	20 ga. steel	---	---
V-Beam	24 ga. steel	24 ga. steel	24 ga. steel or 0.032" alum.	20 ga. steel	18 ga. steel	18 ga. steel
Flashings	24 ga. steel	24 ga. steel	24 ga. steel or 0.032" alum.	20 ga. steel	18 ga. steel	18 ga. steel

a Standard subgirt is 3" wide and 3/8" deep with ¾" legs.
b Alternate subgirt is 3½" wide and ½" deep with ¾" legs.

Fire Resistant Roof

ONE-HOUR FIREROOF

Fabral has conducted one-hour fireroof tests on the unrestrained assembly below. This assembly is also listed in the Underwriters Laboratories *Fire Resistance Directory* as Design No. P516.



1. Metal Roof Deck Panels: 26 ga. minimum steel. Panels continuous over two or more spans. End laps to occur over purlins with panels overlapped a minimum of 4". Sealant may be used at panel side and end laps. Panels must have UL 90 uplift rating with steel purlins.

2. Panel Fasteners: #12-14 self-drilling screws, spaced in accordance with Fabral's fastening schedule for the panel used.

3. Batts and Blankets: faced glass fiber batt material or mineral wool insulation bearing the UL Classification marking.

4. Steel Roof Purlins: C- or Z-shaped, minimum 8" deep, weighing minimum 2.9 lb. Per lineal foot made from minimum 16 ga. steel. Spaced maximum 60" o.c. Purlins may be stiffened at the supports if required per structural design.

5. Beam: Steel I beam sections designed as structural supports to the roof purlins. Minimum weight of steel I beam is 2.9 lb. Per lineal foot.

6. Hanger Wire: Minimum 12 ga. galvanized steel wire; twist-tied to steel roof purlins or joists, located at every purlin/channel intersection and at end of the cold-rolled channels at walls. When alternate Steel Framing Members* (Item 8A or 8B) are used, hanger wire are spaced 48" o.c. (at every third main runner/cross tee intersection). Hanger wires are located adjacent to each main runner splice location.

7. Cold-Rolled Channel: Minimum 16 ga. steel channels, 1 ½" deep with 9/16" flanges. Spaced maximum of 48" o.c.

8. Furring Channel: 25 ga. galvanized steel, 2 5/8" wide, 7/8" deep, spaced 24" o.c. perpendicular to cold-rolled channels; secured to each cold-rolled channel with double strand of 18 ga. galvanized steel wire. Steel Framing Members (Item 8A or 8B) may be substituted.

8A. Steel Framing Members (not shown): Alternate to Item 8. Main runners nominal 12' long, spaced 48" o.c. Ends of main runners at walls to rest on wall angle, without attachment, with ½" to ¾" end clearance. Primary cross tees (1 ½" wide across flange) or cross channels, nominal 4' long, installed perpendicular to main runners and spaced 16" o.c. Additional members required at each wallboard end joint.

8B. Steel Framing Members (not shown): Alternate to items 8 and 8A. Main runners 12' long and 48" o.c. Cross channels, 4' long and installed perpendicular to the main runners, spaced 16" o.c. Additional members required 8" from and at each side of wallboard and joint.

9. Wallboard Gypsum: Any 5/8" thick gypsum wallboard bearing the UL Classification Marking for Fire Resistance. Two layers of 5/8" thick (each) by 48" wide sheets installed with long dimension perpendicular to the furring channels. Inner layer attached to furring channels using 1 ¼" long Type S bugle-head steel screws spaced 8" o.c. along butted end joints and 12" o.c. in the field of the board. Butted end joints to occur midway between continuous furring channels and be backed by joint backer channel which is centered on the end joints and extends 6" beyond both ends of the end joint. Butted end joints to be offset a minimum of 24" in adjacent courses. Outer layer attached to the furring channels through inner layer using 1 7/8" long Type S bugle-head steel screws spaced 8" o.c. at butted end joints and 12" o.c. in the field. Butted end joints to be centered on continuous furring channels and offset a minimum of 12" from end joints of inner layer. Rows of screws on both sides of butted end joints of each layer shall be located 3/8" to 1/2" from end joints. Butted side joints of outer layer to be offset a minimum of 18" from butted side joints of inner layer.

When Steel Framing Members (Items 8A or 8B0 are used, inner layer installed with long dimension perpendicular to cross tees with side joints centered along main runners and end joints centered along cross tees. Inner layer fastened to cross tees with 1 ¼" long Type S bugle-head steel screws spaced 8" o.c. along butted end joints and 12" o.c. in the field of the board. End joints of adjacent wallboard sheets shall be staggered 4' o.c. maximum. Outer layer attached to cross tees through inner layer using 1 7/8" long Type S bugle-head steel screws spaced 8" o.c. at butted end joints and 12" o.c. in the field. Butted end joints to be centered along cross tees and offset a minimum of 32" from end joints of inner layer. Rows of screws on both sides of butted end joints of each layer shall be located 3/8" to 1/2" from end joints. Butted side joints of outer layer to be offset a minimum of 18" from butted side joints of inner layer.