



MATERIAL AND THICKNESS	WT./SQ. PLAIN	WT./SQ. PAINTED	METAL SPECIFICATION	FINISH
GALVANIZED STEEL 26 ga. 24 ga. 22 ga. 20 ga. 18 ga.	103.8 lb. 132.0 lb. 160.5 lb. 189.1 lb. 246.1 lb.	105.3 lb. 133.5 lb. 162.0 lb. 190.6 lb. 247.6 lb.	Grade 50 Grade 40 (18 ga.) Grade 80 (26 ga.) structural steel with G90 coating, all conforming to ASTM A 653	plain: regular spangle painted: two-coat 70% Kynar® 500/ Hylar® 5000; siliconized polyester; vinyl plastisol; 0.5 mil two-coat polyester backer
ALUMINUM-ZINC ALLOY COATED STEEL 24 ga. 22 ga. 20 ga. 18 ga.	127.7 lb. 156.3 lb. 185.0 lb. 242.2 lb.	129.2 lb. 157.8 lb. 186.5 lb. 243.7 lb.	Grade 50 Grade 40 (18 ga.) structural steel with AZ50 coating, both conforming to ASTM A 792	plain: regular spangle painted: two-coat 70% Kynar® 500/ Hylar® 5000; siliconized polyester; vinyl plastisol; 0.5 mil two-coat polyester backer
ALUMINUM .032" .040" .050"	51.6 lb. 64.4 lb. 80.5 lb.	52.7 lb. 65.6 lb. 81.7 lb.	3004-H36 or equivalent (28 ksi yield strength) aluminum alloy conforming to ASTM B 209	plain: mill finish painted: two-coat 70% Kynar® 500/ Hylar® 5000; siliconized polyester; vinyl plastisol; 0.5 mil two-coat polyester backer

Grade 40 – 40 ksi yield strength
Grade 50 – 50 ksi yield strength
Grade 80 – 80 ksi yield strength

GRAVITY LOAD TABLE (STEEL) (psf)

ga.	spans	4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"
26	1	125	80	56	41	31	25	NR
	2	107	68	47	35	27	NR	NR
	3	133	85	59	43	33	26	NR
24	1	127	81	56	41	32	25	NR
	2	118	75	52	38	29	23	NR
	3	147	94	65	48	37	29	24
22	1	173	111	77	56	43	34	28
	2	159	102	71	52	40	31	25
	3	199	127	88	65	50	39	32
20	1	220	141	98	72	55	43	35
	2	203	130	90	66	51	40	33
	3	254	163	113	83	64	50	41
18	1	314	201	140	103	79	62	50
	2	303	194	135	99	76	60	48
	3	379	242	168	124	95	75	61

GRAVITY LOAD TABLE (ALUM) (psf)

thk.	spans	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"
.032"	1	103	81	66	54	46	39	34
	2	91	72	58	48	40	34	30
	3	113	90	73	60	50	43	37
.040"	1	151	119	97	80	67	57	49
	2	133	105	85	71	59	51	44
	3	167	132	107	88	74	63	54
.050"	1	212	167	136	112	94	80	69
	2	187	148	120	99	83	71	61
	3	234	185	150	124	104	89	76

NOTES:

- Allowable loads are based on 1986 AISI and 1986 Aluminum Association specifications.
- Allowable loads are based on stress only.
- Use of Hefti-Rib on roof pitches less than 2:12 (9°) is not recommended.
- The maximum recommended individual roof panel length is 16' for aluminum panels and 32' for steel panels due to thermal movement considerations.

HEFTI-RIB® SPECIFICATIONS

1.01 SUMMARY

- A. Section includes: Pre-finished, prefabricated, structural, exposed fastener roof and wall system and accessories.
- B. Related Sections
 - 1. Metal decking
 - 2. Rough carpentry, plywood, and underlayment
 - 3. Insulation
 - 4. Membrane roofing
 - 5. Flashing and sheet metal
 - 6. Joint sealers: sealants and caulk
 - 7. Structural framing.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A 653: Steel Sheet, Zinc-Coated by the Hot Dip Process
 - 2. ASTM A 792: Steel Sheet, Aluminum-Zinc Alloy Coated by the Hot Dip Process.
 - 3. ASTM B 209: Aluminum and Aluminum Alloy Sheet and Plate.
- B. Sheet Metal and Air Condition Contractors National Association, Inc. (SMACNA)
 - 1. SMACNA Architectural Sheet Metal Manual, 1993 Edition.
- C. American Iron and Steel Institute (AISI)
 - 1. AISI Cold Formed Steel Design Manual
- D. Aluminum Association
 - 1. Aluminum Design Manual
- E. Metal Construction Association (MCA)
 - 1. Preformed Metal Wall Guidelines
- F. Code references
 - 1. ASCE, Minimum Loads for Buildings and Other Structures
 - 2. BOCA National Building Code
 - 3. UBC Uniform Building Code
 - 4. SBC Standard Building Code

1.03 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide factory formed, pre-finished, lappable, exposed fastener, structural, ribbed metal roof and wall system, that has been pre-tested and certified by manufacturer to comply with specified requirements under installed conditions.
 - 1. The metal roofing/siding system including required trim members shall meet the specified requirements for snow loads and wind loads.
 - 2. The panel will have 1½" high ribs at 7.2" o.c. The width of the crests shall be 2". The width of the valleys shall be 2".
- B. Structural Requirements: Engineer panels for structural properties in accordance with latest edition of American Iron and Steel Institute's *Cold Formed Steel Design Manual* using "effective width" concept and Aluminum Association's *Aluminum Design Manual*.

1.04 SUBMITTALS

- A. Product Data: submit manufacturer's specifications, standard profile sheet, product data brochure and finish warranty.
- B. Shop Drawings: shop drawings showing roof plan and wall elevations with layout of panels, screws, underlayment and sections of each flashing/trim condition shall be submitted for approval prior to fabrication. Drawings shall contain material type, metal thickness and finish. Drawings shall distinguish between factory and field fabrication.
- C. Samples:
 - 1. Submit sample 12" long x full width panel, showing proposed metal gauge, seam profile and specified finish.
 - 2. Submit manufacturers standard colors for Architect's selection.
- D. Certification: Submit manufacturer's certification that materials and finishes meet specification requirements.

1.05 QUALITY ASSURANCE

- A. Panel manufacturer shall have a minimum of ten (10) years of experience in manufacturing exposed fastener roofing and siding panels in a permanent stationary indoor facility.
- B. Panel installer shall have a minimum of two (2) years experience in the installation of exposed fastener roofing and siding and show evidence of successful completion of at least three (3) projects of similar size, scope, and complexity.

1.06 DELIVERY, STORAGE, and HANDLING

- A. Panels and flashings shall be protected and properly packaged to protect against transportation damage in transit to the jobsite.
- B. Upon delivery, exercise care in unloading, stacking, moving, storing, and erecting panels and flashings to prevent twisting, bending, scratching, or denting.
- C. Store panels and flashings in a safe, dry environment under a waterproof covering to prevent water damage. Allow for adequate ventilation to prevent condensation. Panels and flashings with strippable film shall not be stored in direct sunlight.
- D. Upon exposure to direct sunlight, immediately remove strippable film from panels and flashings. Protect panels and flashings from foot traffic and from all other trades.

1.07 PROJECT CONDITIONS

- A. Field dimensions shall be taken prior to fabrication to verify jobsite conditions.
- B. Minimum recommended pitch for this panel is 2:12.
- C. Maximum panel length is 45' (contact the factory for longer panels).

1.08 WARRANTIES

- A. Panel manufacturer shall provide a twenty (20) year warranty on the paint finish covering chalking, cracking, checking, chipping, blistering, peeling, flaking, and fading.
- B. Applicator shall furnish written warranty for a two (2) year period from date of substantial completion of building covering repairs required to maintain roof and flashings in watertight conditions.

2.01 PRODUCT DESCRIPTION

- A. Hefti-Rib structural exposed fastener roof and wall system as manufactured by Fabral, 3449 Hempland Road, Lancaster, PA 17601; ph.: 717-397-2741; fax: 717-397-1040.
- B. The Hefti-Rib panel shall have a coverage of 36". Rib height shall be 1½".
- C. Panels shall be directly fastened to the substrate.
- D. The panel shall have a overlapping sidelap feature.

2.02 PRODUCT SUBSTITUTIONS

- A. Requests to use alternate systems shall be submitted in writing to the project designer at least ten (10) days prior to bid date. Request shall demonstrate proposed substitution meets or exceeds specified performance requirements. Certified statements, samples and descriptive data shall be included in this submittal request.
- B. Manufacturers listed in this section are pre-qualified manufacturers. Substitution of manufacturer's products for those specified shall not be allowed at anytime during construction.

2.03 MATERIALS AND FINISHES

- A. Panel materials
 - 1. 24, 22, or 20 gauge Grade 50 (50 ksi yield strength), or 18 gauge Grade 40 (40 ksi yield strength) or 26 gauge Grade 80 (80 ksi yield strength) structural steel with G90 (0.90 oz./ft.²) hot dipped galvanized coating, both conforming to ASTM A 653.
 - 2. 24, 22, or 20 gauge Grade 50 (50 ksi yield strength), or 18 gauge Grade 40 (40 ksi yield strength) structural steel with AZ50 (0.50 oz./ft.²) aluminum-zinc alloy coating, both conforming to ASTM A 792.
 - 3. 0.032, 0.040, or 0.050", 3004-H36 or equivalent (28 ksi yield strength) aluminum alloy conforming to ASTM B 209.
- B. Texture: panels shall be smooth.

- C. Finish: Refer to manufacturer's standard color card to determine appropriate finish and color. All panels shall receive a factory-applied (siliconized polyester) (Kynar® 500/Hylar® 5000*) (vinyl plastisol) (26 ga. panels shall have EnduraCoat) conforming to the following:

- 1. Metal preparation: all metal shall have the surfaces carefully prepared for painting on a continuous process coil coating line by alkali cleaning, hot water rinsing, application of chemical conversion coating, cold water rinsing, sealing with an acid rinse, and thorough drying.
- 2. Prime coating: a base coat of epoxy paint, specifically formulated to interact with the top-coat, shall be applied to the prepared surfaces by roll coating to a dry film thickness of 0.20 ± 0.05 mils. This prime coat shall be oven cured prior to application of finish coat.
- 3. Exterior coating: a finish coating (see above) shall be applied over the primer by roll coating to a dry film thickness of 0.80 ± 0.05 mils (3.80 ± 0.05 mils for vinyl plastisol) for a total dry film thickness of 1.00 ± 0.10 mils (4.00 ± 0.10 mils for vinyl plastisol). This finish coating shall be oven-cured.
- 4. Interior coating: a washcoat shall be applied on the reverse side over the primer by roll coating to a dry film thickness of 0.30 ± 0.05 mils for a total dry film thickness of 0.50 ± 0.10 mils. The washcoat shall be oven-cured.
- 5. Color: the color of the exterior finish shall be _____ as chosen from the manufacturer's standard color chart.
- 6. Physical properties: the coating shall conform to the manufacturer's standard performance criteria as listed by certified test reports for fade, chalk, abrasion, humidity, adhesion, pollution resistance, and others as required and standard within the industry.

2.04 ACCESSORIES

- A. Flashing and Trim
 - 1. All flashing and trim shall be of the same material, gauge, finish, and color as the roof panels and fabricated in accordance with standard SMACNA procedure and details.
 - 2. Fabricate gutters and downspouts in the same gauge, material, finish, and color as the roof panels.
- B. Fasteners
 - 1. All screws shall be aluminum, plated steel, or stainless steel. They shall have a combination steel and EPDM washer.
 - 2. Screws for panel to girt/purlins shall be of the type and size _____ and of sufficient length to penetrate the supporting member by 1". All fasteners shall be applied in accordance with the fastening schedule for Hefti-Rib.
 - 3. Screws for flashings and sidelaps shall be #14 HHA x ¾" sheet metal stitch screws. All accessories, flashings, and sidelaps shall be fastened 12" o.c.
- C. Caulking shall be a polyurethane where it is exposed and there is no thermal movement. All caulking or sealing shall be done in a neat manner with excess caulking or sealant removed from exposed surfaces.
- D. Caulking shall be non-skinning, non-hardening gun grade butyl sealant or butyl sealant tape with a minimum thickness of ¼" where it is concealed and where thermal movement must be accommodated. All caulking or sealing shall be done in a neat manner with excess caulking or sealant removed from exposed surfaces.
- E. Closures shall be pre-molded polyethylene to match the profile of the Hefti-Rib panel and shall be in lengths as supplied by the panel manufacturer.
- F. Vapor Retarder:
 - 1. Retarder with a permeance of 0.05 or less as determined by ASTM E 98.

2.05 RELATED MATERIALS

- A. Refer to other sections listed in Related Sections paragraph for related materials.

2.06 FABRICATION

- A. Panels are lappable. It is recommended that individual aluminum roof panels not exceed 16' in length and steel roof panels not exceed 32' in length for thermal movement reasons.
- B. Panels shall be roll formed on a stationary industrial type rolling mill to gradually shape the sheet metal. Portable rollformers, rented or owned by the installer, are not acceptable.
- C. Fabricate flashings from the same material as the roof system.

2.07 SOURCE QUALITY

- A. Source Quality: obtain metal panels and accessories from a single manufacturer.
- B. Fabrication tolerances
 - 1. Rib height: 1½" ± ¼".
 - 2. Panel shearing length: ± ¼" maximum.
 - 3. Follow tolerances in MCA's Preformed Metal Wall Guidelines.
- C. Tests and inspections
- D. Verification of performance

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product cartons for installation.

3.02 EXAMINATION

- A. Installer shall:
 - 1. Inspect purlins, girts, and/or roof deck to verify that they comply with shop drawings and are smooth, even, sound, and free of depressions.
 - 2. Report variations and potential problems in writing to the architect.

3.03 INSTALLATION

- A. Conform to the standard set forth in the SMACNA architectural sheet metal manuals and the approved shop drawings detailed for the project.
- B. Install panels plumb, level, and straight with the ribs parallel, conforming to the design as indicated.
- C. Install panel system so it is watertight, without waves, warps, buckles or distortions, and allow for thermal movement considerations.
- D. Abrasive devices shall not be used to cut on or near roof or wall panel system.
- E. Apply sealant tape or caulking as necessary at flashing and panel joints to prevent water penetration.
- F. Remove any strippable film immediately upon exposure to direct sunlight.
- G. Vapor retarder: The joints, perimeter, and all openings shall be sealed per the manufacturer's instructions to provide a continuous vapor retarder.
- H. Underlayment (solid substrate):
 - 1. Provide an underlayment with horizontal overlaps and endlaps staggered between layers.
 - 2. Provide ice and water shield membrane at all valley and eave conditions as well as any area at less than a 3:12 slope.
 - 3. Lay parallel to ridge line with 2½" horizontal laps and 6" vertical laps

3.04 CLEANING

- A. Dispose of excess materials and debris from jobsite.
- B. Remove filings, grease, stains, marks, or excess sealants from roof panel system to prevent staining.
- C. Protect work from damage from other trades until final acceptance.

* Kynar® 500 is a registered trademark of Elf Atochem North America, Inc.
Hylar® 5000 is a registered trademark of Ausimont USA, Inc.