LEGACY REPORT

ER-4785

Reissued January 1, 2006

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www.icc-es.org

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Legacy report on the 1997 *Uniform Building Code™*

DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07560—Fluid Applied Roofing

METACRYLICS ACRYLIC POLYESTER ROOF SYSTEMS

METACRYLICS
142 NORTH 27TH STREET
SAN JOSE, CALIFORNIA 95116-1118

1.0 SUBJECT

Metacrylics Acrylic Polyester Roof Systems.

2.0 DESCRIPTION

2.1 General:

The Metacrylics roof-covering systems are Class A roof coverings for installation over insulated, combustible and noncombustible substrates and over existing roof coverings. The roofing systems consist of liquid-applied coatings reinforced with polyester fabric, applied by applicators qualified under the Metacrylics training program.

2.2 Materials:

2.2.1 Metacrylics Acrylic Primer: The primer is an acrylic copolymer water-based emulsion used to seal substrates prior to roof-covering application. Packaged in 2-, 5- or 55-gallon (7.5, 19 or 208 L) containers, the product must be stored at 35˚F (2˚C), minimum. The primer is mixed for two to three minutes by hand or machine prior to use. Small amounts of water may be used to thin the material, if necessary. A brush, roller or spray apparatus is used to apply the material. Where application is not intended, the area is masked. The material should not be applied when rain or freezing weather is imminent within 24 hours following application. Shelf life is 12 months.

2.2.2 Metacrylics Acrylic Base: The acrylic base is an acrylic copolymer water-based emulsion packaged in 2-, 5- or 55-gallon (7.5, 19 or 208 L) containers. The product is stored at a minimum 35˚F (2˚C) and is mixed two to three minutes by machine or hand before application. The application surfaces must be clean, dry and free of dust and oily residue. Where the substrate is new galvanized metal, an acidic solution must be applied prior to application, to enhance bonding. The acrylic base should not be applied if rain or freezing weather is imminent within 24 hours following application. Shelf life is 24 months.

2.2.3 Metacrylics Acrylic White Coating: The acrylic white coating is an acrylic polymer emulsion combined with 92 percent pure titanium dioxide. This material is packaged in 2-, 5- or 55-gallon (7.5, 19 or 208 L) containers. When stored at a minimum 40˚F (4˚C), the sealer has a shelf life of 24 months. The product is mixed two to three minutes by hand or machine prior to application. Surfaces must be clean, dry and free of dust and oily residue prior to topcoat application. The topcoat should not be applied if rain or freezing weather is imminent within 24 hours following application.

2.2.4 Metacrylics Stitch Bond Polyester Fabric: The stitch bond polyester nonwoven product weighs approximately 3 ounces per square yard (100 g/m^2). Thread count is 14 to 18 per inch (5 to 7 per cm) in each direction. Tensile strength is 56 pounds per inch (9.8 kg/m). The fabric is available in 40-inch-wide (1016 mm) by 30-, 108- and 324-foot-long (9, 33 or 99 m) rolls, and in 2-, 4-, 6-, 9-, 12- and 20-inch-wide (51, 102, 152, 229, 305 and 508 mm) by 160-foot-long (48 m) rolls.

2.2.5 Metacrylics Acrylic Gel: The acrylic gel is a water-based, acrylic polymer mastic combined with 92 percent pure titanium dioxide. Used for flashing and fabric embedment, the product is packaged in 2- and 5-gallon (9.5 and 19 L) containers that must be stored at a minimum 35˚F (2˚C). Prior to application, all surfaces must be clean, dry and free of dust and oily residue. Metacrylics acrylic primer is required before gel application unless the flashings are new. New metal flashings may be treated with an acidic solution.

Application cannot exceed a $^1/_4$-inch (6.4 mm) thickness. Product has a shelf life of twelve months.

2.3 New Substrates:

2.3.1 General: Metacrylics roofing systems may be applied to combustible substrates such as minimum $^{15}/_{32}$-inch-thick (12 mm) plywood and wood-based structural-use panels or steel deck. Installation details are shown in Figure 1.

2.3.2 Insulation Board: Insulation materials include Dens Deck, glass fiber, perlite, and gypsum sheathing. The insulation board adjacent to surfaces to be coated must be completely free of degraded surfaces, overspray, grease, oil, dirt and other contamination that may interfere with proper coating adhesion. The surface must be completely dry. All physical damage to the insulation board must be repaired prior to coating applications.

2.3.2.1 Dens Deck: Dens Deck, manufactured by Georgia-Pacific Corp., is a $^1/_4$-inch-thick (6.4 mm) board consisting of fiberglass mat facings over a silicone-treated gypsum core that must comply with ASTM C 79.

2.3.2.2 Glass Fiber Board: The glass fiber board complies with ASTM C 1139 as a Type III board.

2.3.2.3 Perlite: The perlite board complies with ASTM C 728.

2.3.2.4 Gypsum Sheathing: The water-resistant core gypsum sheathing is minimum $^1/_2$ inch (12.7 mm) thick. The boards comply with ASTM C 79.

2.3.3 Coatings: The acrylic primer is applied to the entire insulation surface and is allowed to dry for two hours, minimum. The surface should be completely dry before the applicator is allowed to walk across it. Flashing is installed in accordance with Sections 1508 and 1509 of the 1997 *Uniform Building Code*™ (UBC). The coatings are then applied in accordance with Table 1, using airless spray equipment, brush or roller. The minimum ambient application temperature is 55˚F (13˚C). The completed surface must be uniformly coated and free of pinholes and blisters.

The recommended coverage rate per gallon, per coat, should not be exceeded. Each coat must be sufficiently dry to allow foot traffic. Metacrylics acrylic gel is used at all penetrations, including skylights and ridge vents, at a $^1/_8$-inch (3.2 mm) thickness, followed by a layer of stitch bond polyester fabric and an additional layer of gel.

The acrylic base is applied to the primed, dry surface, followed by immediate application of the stitch bond polyester fabric into the fresh acrylic base. Wrinkles in the coating may be removed by pulling lightly on the polyester fabric. The fabric is lapped approximately 3 inches at all edges and pressed into the base using a roller or soft bristle brush. Immediately following fabric application, a cover coat of acrylic base is applied. The second layer is allowed to cure for 24 to 48 hours or until dry to the touch. An acrylic white coating is then applied. After this first coat is dry to the touch, a second layer of acrylic white coating is applied, followed by optional No. 30 washed sand broadcast into the wet topcoat. After this coating layer dries to the touch and all loose, unadhered sand is removed, an additional third topcoat layer is applied over the sand. The topcoat must cure for at least 24 hours. Full curing of the coating system can extend to 30 days.

2.4 Existing Built-up Roof Coverings:

Prior to installation of the Metacrylics Acrylic Polyester Roof System, an inspection of the existing roofing system is needed. See Section 1515 of the UBC Appendix for procedures. The existing roofing must be a Class A or B uninsulated built-up roofing with a mineral-surfaced cap sheet. All loose and deleterious materials, including loose gravel, dust, debris and other accumulation, must be vacuumed so that dust is minimized during the cleaning process. Asphalt buildup must also be removed to provide a uniform, smooth surface. For cap sheets, all blisters are repaired by cross-cutting the blister and folding back the flaps to allow trapped moisture to evaporate or otherwise be removed. Metacrylics acrylic gel patching compound is then troweled into the opening to an approximate $^1/_4$-inch (6.4 mm) thickness. The flaps are then placed back into the patching compound, with the excess trimmed. Flaps are nailed down with roofing nails using 1-inch-square (25 mm) washers that are flush with the roof surface. Additional gel is then troweled to a minimum $^1/_8$-inch (3.2 mm) thickness over the flaps, followed by polyester fabric and a subsequent thin layer of gel.

Where delaminated materials are encountered, they are removed to a sound layer followed by the acrylic prime coat as needed. Depressions more than $^1/_4$ inch (6.4 mm) deep must be filled with mortar or an approved weather-resistive product prior to repair. The gel is then troweled to approximately $^1/_8$ inch (3.2 mm) thickness, followed by the polyester mat. Additional gel is then placed over the fabric.

Metacrylics roofing systems are then directly applied in accordance with Section 2.3 and Table 1.

2.5 Wind Uplift:

2.5.1 Mechanically Fastened Insulation over Wood Substrates: The Metacrylics roof-covering system is rated for a maximum uplift resistance of 100 mph (161 km/h), Exposure C, at elevations up to 80 feet (25 meters) above grade, when constructed as follows: Decking is minimum $^{15}/_{32}$-inch (12 mm) plywood. The insulation, minimum $1^1/_2$ inches (38 mm) thick including $^1/_4$-inch-thick (6.4 mm) Dens Deck or $^1/_2$-inch (12.7 mm) gypsum sheathing overlay, is then attached to the deck with No. 12 by $2^1/_4$-inch-long (57 mm), self-drilling, self-tapping, washerhead coated steel screws combined with a $3^5/_{16}$-inch-diameter (84 mm) by $^1/_{16}$-inch-thick (1.6 mm) plastic plate manufactured by Buildex. Where insulation exceeds $1^1/_2$ inches (38 mm) thickness, screw length is increased proportionately. Fastener density is approximately one fastener for 2 square feet (0.186 m^2) of board. Near roof discontinuities such as rakes, eaves and ridges, fastener density must be increased to one fastener per square foot of board. All joints are then covered with a 2-inch-wide (51 mm) tape. The coatings are applied as noted in Section 2.3.

2.5.2 Mechanically Fastened Dens Deck over Steel Decks: The Metacrylics roof-covering system is rated for a maximum uplift resistance as described in the paragraphs below when installed over minimum No. 22 gage (0.0299 inch/0.76 mm) steel deck. The installation requires $^1/_4$-inch-thick (6.4 mm) Dens Deck Barrier Board, and optional insulation. The coatings are applied as described in Section 2.3.

2.5.2.1 Option 1: The Buildex fasteners described in Section 2.5.1 are placed through the Dens Deck and insulation into the steel deck. These fasteners must be long enough to penetrate the deck. To achieve a wind uplift resistance of 70 mph (113 km/h), Exposure B, at elevations up 40 feet (12 m), fastener density is 16 per 4-by-8 Dens Deck Board, with a 6-inch (152 mm) edge distance. Dens Deck is placed perpendicular to fluted steel deck. The fastener density is increased to 32 fasteners per board at discontinuities such as eaves, rakes and ridges.

2.5.2.2 Option 2: The Buildex fasteners described in Section 2.5.1 are placed through the Dens Deck and insulation into the steel deck. These fasteners must be long enough to penetrate the deck to achieve a wind uplift resistance of 80 mph (129 km/h), Exposure C, at elevations up to 40 feet (12 m). Fastener density is 18 per 4-by-8 Dens Deck board, with a 6-inch (152 mm) edge distance. The density is increased to 36 fasteners per board at discontinuities such as rakes, eaves and ridges.

2.5.3 Reroofing: The wind uplift resistance of Metacrylics systems applied over existing roof covering must be determined by the building official, but must be limited to 80 mph (129 km/h), Exposure C, 40 feet (12 mm) above grade.

2.6 Identification:

Roof components bear labels noting the product name, the Metacrylics name and address, the evaluation report number (ER-4785), the expiration date and the name of the inspection agency (Underwriters Laboratories Inc.).

3.0 EVIDENCE SUBMITTED

Data in accordance with the Acceptance Criteria for Membrane Roof Covering Systems (AC75), dated June 2003.

4.0 FINDINGS

That the Metacrylics Acrylic Polyester Roof Systems comply with the 1997 *Uniform Building Code*™ (UBC), subject to the following conditions:

4.1 The materials and application procedures comply with this report and the manufacturer's instructions.

4.2 Application is by roofers approved by Metacrylics.

4.3 Where moderate to heavy foot traffic occurs, such as for maintenance of equipment, the roof covering must be adequately protected to prevent rupture or wearing of the surface.

4.4 The components are manufactured in San Jose, California, under a quality control program with inspections by Underwriters Laboratories Inc. (AA-668).

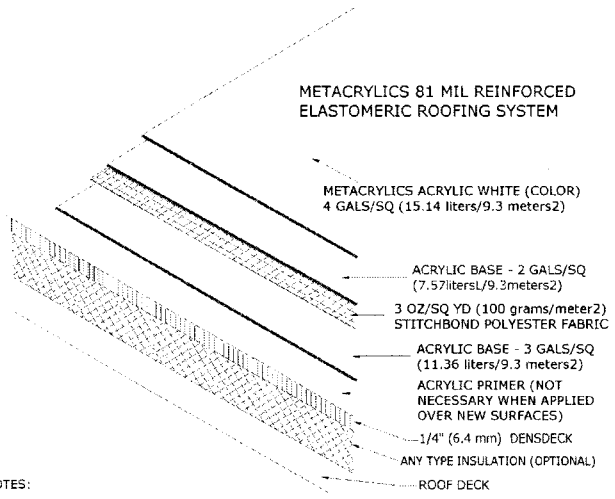
4.5 Reroofing applications are inspected in accordance with Section 1515 of the UBC Appendix.

This report is subject to re-examination in two years.

TABLE 1—METACRYLICS ROOFING SYSTEMS

SYSTEM NO./CLASS	SUBSTRATE	BASE SHEET	INSULATION		MEMBRANE COATING			ROOF SLOPE (inch/ horiz. foot)
			Type	Thickness (inches)	Type	Coverage (gal/square)	Minimum Dry Film Thickness (mils)	
1. Class A	No. 22 gage steel deck	None	Dens Deck Overlayment Board (gypsum sheathing) over any type of insulation board	1 1/4" to 6"	1. Metacrylics Acrylic Base 2. Metacrylics Stitchbond Polyester 3. Metacrylics Acrylic Base 4. Three Coats Metacrylics Acrylic White	3 — 2 4	27 — 18 36	1/4" to 1/2"
2. Class A	Min. 15/32" plywood or No. 22 gage steel deck	None	Dens Deck Overlayment Board (gypsum sheathing) over any type of insulation board	1 1/4" to 6"	1. Metacrylics Acrylic Base 2. Metacrylics Stitchbond Polyester 3. Metacrylics Acrylic Base 4. Three Coats Metacrylics Acrylic White	3 — 2 4	27 — 18 36	1/4" to 1/2"
3. Class A	Min. 15/32" plywood or No. 22 gage steel deck	None	Dens Deck Overlayment Board (gypsum sheathing) over any type of insulation	Min. 1/2" Min. 1/4"	1. Metacrylics Acrylic Base 2. Metacrylics Stitchbond Polyester 3. Metacrylics Acrylic Base 4. Three Coats Metacrylics Acrylic White	3 — 2 4	27 — 18 36	1/4" to 1/2"
4. Class A	Min. 15/32" plywood with Class A cap sheet BUR (reroofing)	None	None	None	1. Metacrylics Acrylic Primer 2. Metacrylics Acrylic Base 3. Metacrylics Stitchbond Polyester 4. Metacrylics Acrylic Base 5. Three Coats Metacrylics Acrylic White	1 3 — 2 4	3 27 — 18 36	1/4" to 1/2"
5. Class A	Min. 15/32" plywood with Class A gravel BUR (reroofing)	None	None	None	1. Metacrylics Acrylic Primer 2. Cold Asphalt Clay Emulsion 3. Metacrylics Acrylic Base 4. Metacrylics Stitchbond Polyester 5. Metacrylics Acrylic Base 6. Three Coats Metacrylics Acrylic White	1.5 12 5 — 2 4	4.5 40 45 — 18 36	1/4" to 1/2"
6. Class A	Min. 15/32" plywood with Class A or B gravel BUR (reroofing)	None	Dens Deck Overlayment Board (gypsum board)	Min. 1/4"	1. Metacrylics Acrylic Base 2. Metacrylics Stitchbond Polyester 3. Metacrylics Acrylic Base 4. Three Coats Metacrylics Acrylic White	3 — 2 4	27 — 18 36	1/4" to 1/2"

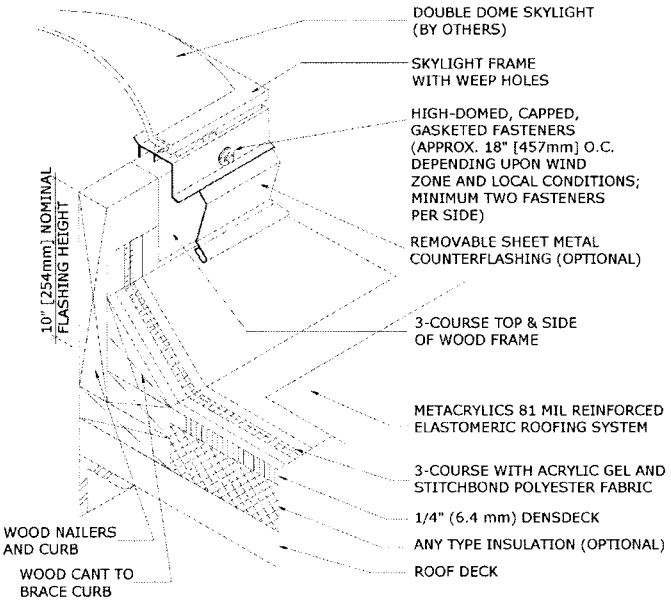
For **SI:** 1 inch = 25.4 mm, 1 mil = 0.0254 mm, 1 gallon per square = 3.785 L/9.3 m^2, 1 inch per horizontal foot = 25.4 mm/305 mm.



NOTES:

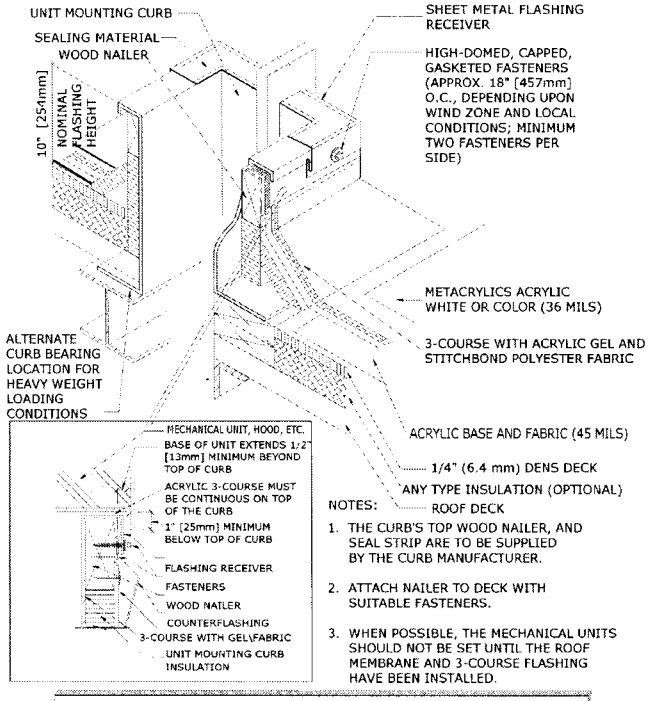
1. THIS DETAIL IS A TYPICAL INSTALLATION OVER A NEW/SMOOTH ROOF SURFACE. APPLICATION OVER TAR AND GRAVEL BUR WILL REQUIRE 12 GALS/SQ (45.4 liters/9.3 meters2) OF CLAY EMULSION AND AN ADDITONAL 2 GALS/SQ (7.57 liters/9.3 meters2) OF ACRYLIC BASE.
2. PRIMER IS NORMALLY NOT REQUIRED ON NEW CONSTRUCTION MATERIALS, E.G., DENSDECK, CONCRETE, WOOD, METAL, ETC. ALL NEW SURFACES MUST BE THOROUGHLY CLEANED PRIOR TO APPLICATION OF ACRYLIC BASE. ACRYLIC PRIMER IS REQUIRED ON ALL RE-ROOFING/DECK SURFACES. APPLY 1 GAL/SQ (3.78 liters/meter2) OVER SMOOTH SURFACES (E.G. BUR CAPSHEET), APPLY 1.5 GALS/SQ (5.68 liters/9.3 meters2) OVER ROUGH SURFACES, E.G., BUR TAR & GRAVEL.

METACRYLICS FLUID APPLIED ELASTOMERIC ROOFING SYSTEM — META-1



NOTE:
ATTACH NAILER TO DECK WITH SUITABLE FASTENERS.

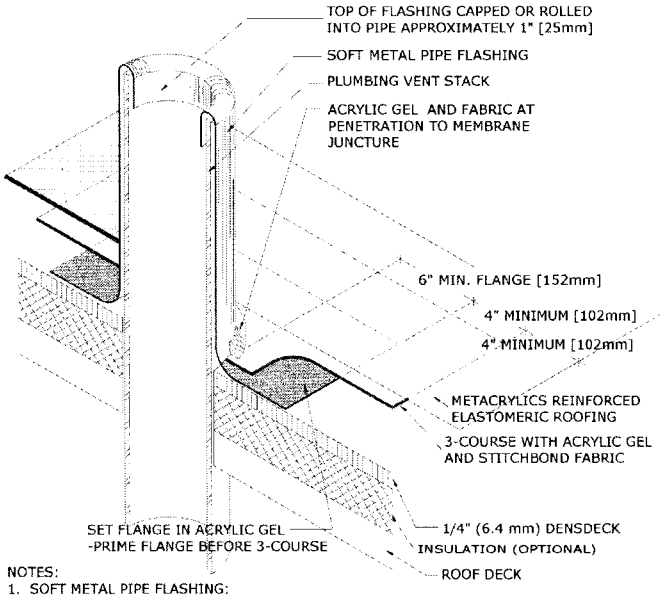
SKYLIGHT, SCUTTLE, AND SMOKE VENT — META-16



NOTES:

1. THE CURB'S TOP WOOD NAILER, AND SEAL STRIP ARE TO BE SUPPLIED BY THE CURB MANUFACTURER.
2. ATTACH NAILER TO DECK WITH SUITABLE FASTENERS.
3. WHEN POSSIBLE, THE MECHANICAL UNITS SHOULD NOT BE SET UNTIL THE ROOF MEMBRANE AND 3-COURSE FLASHING HAVE BEEN INSTALLED.

RAISED CURB DETAIL FOR ROOFTOP AIR HANDLING UNITS AND DUCTS (PREFABRICATED METAL CURB) — META-14

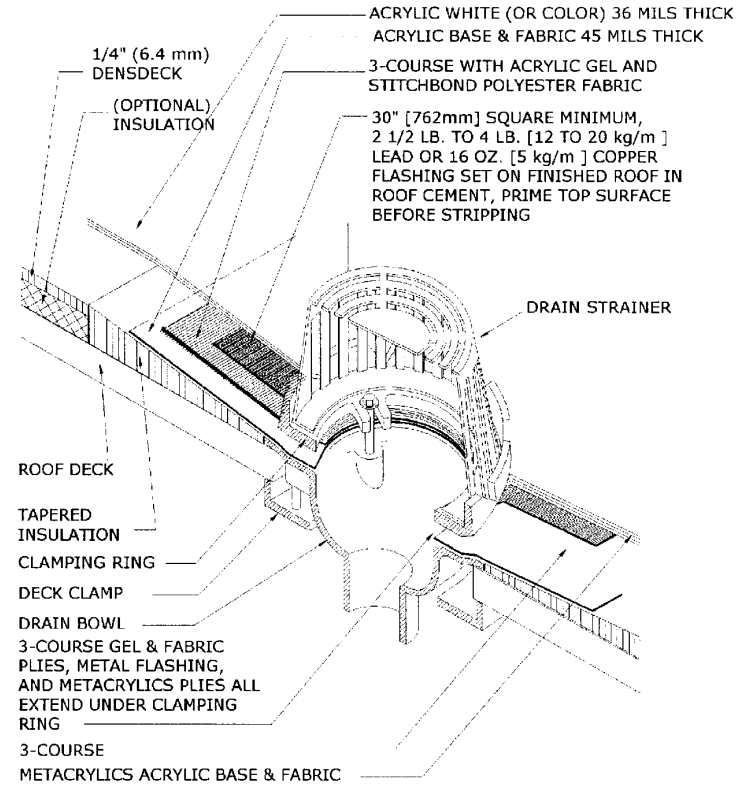


NOTES:

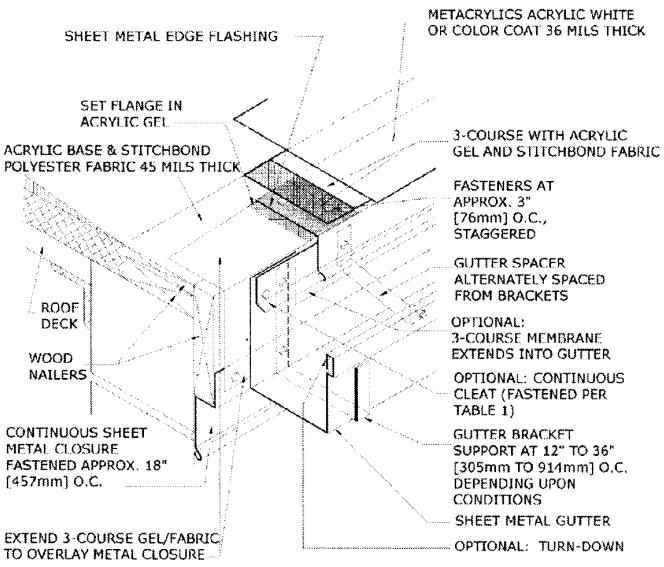
1. SOFT METAL PIPE FLASHING:
   - SHEET LEAD: MINIMUM OF 2 1/2 LB. PER SQUARE FOOT [12 kg/m] OR
   - SHEET COPPER: MINIMUM 16 OZ. [5 kg/m].
2. IF USING COPPER FLASHING OVER AN IRON OR STEEL PIPE, INSERT A SEPARATOR SHEET (E.G., ASPHALTSATURATED ROOFING FELT), WRAPPED AROUND PIPE, TO SEPARATE THE COPPER FLASHING FROM DIRECT CONTACT WITH PIPE, TO REDUCE GALVANIC ACTION.
3. VENT STACKS AND OTHER PIPES SHOULD HAVE A MINIMUM OF 12 INCHES [305mm] OF CLEARANCE ON ALL SIDES FROM WALLS, CURBS, AND OTHER PROJECTIONS TO FACILITATE PROPER FLASHING.

PLUMBING VENT — META-21

FIGURE 1—INSTALLATION DETAILS

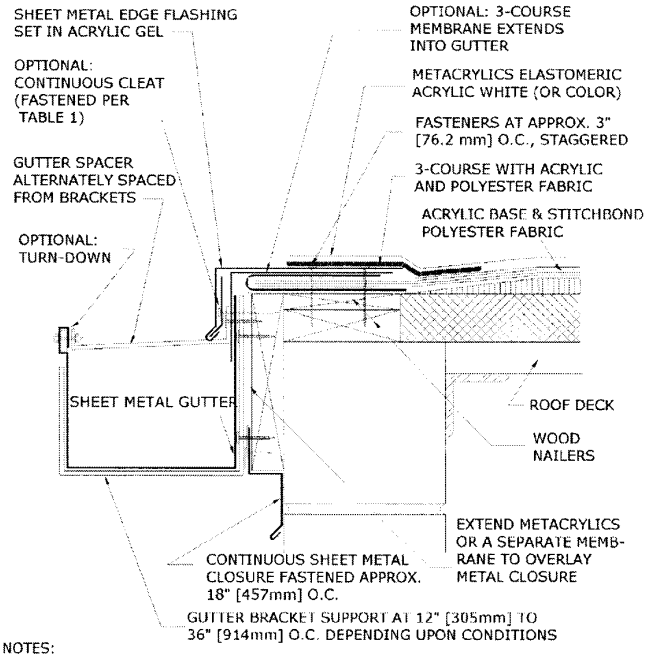


ROOF DRAIN META-23A



NOTES:
1. IN CLIMATES WHERE THE WINTER TEMPERATURE REMAINS BELOW FREEZING FOR EXTENDED PERIODS OF TIME, METACRYLICS SUGGESTS USING INTERIOR DRAINS OR THROUGH-CURB SCUPPERS TO DRAIN THE ROOF.
2. GUTTER BRACKETS ARE RECOMMENDED TO BE AT LEAST ONE GAUGE HEAVIER THAN GUTTER STOCK.
3. ATTACH WOOD NAILER TO WALL/DECK WITH SUITABLE FASTENERS.
4. DESIGN GUTTER EXPANSION JOINTS PLACED AT APPROPRIATE INTERVALS COMMENSURATE WITH TYPE OF METAL.

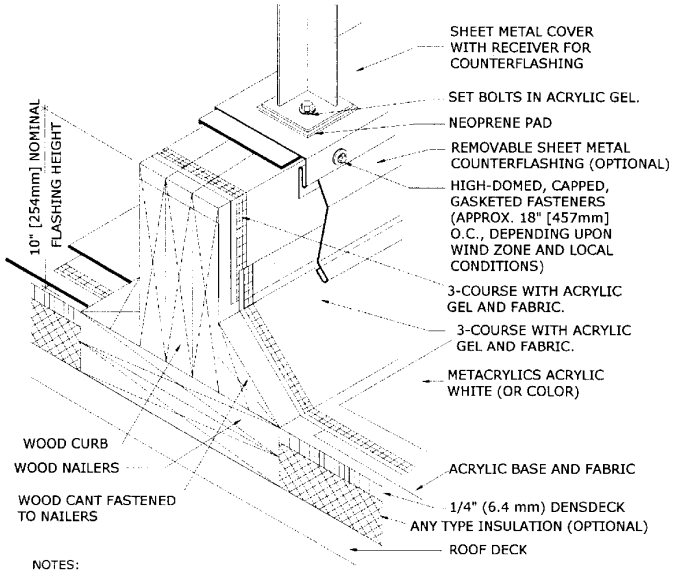
GUTTER META-24



NOTES:
1. IN CLIMATES WHERE THE WINTER TEMPERATURE REMAINS BELOW FREEZING FOR EXTENDED PERIODS OF TIME, METACRYLICS SUGGESTS USING INTERIOR DRAINS OR THROUGH-CURB SCUPPERS TO DRAIN THE ROOF.
2. GUTTER BRACKETS ARE RECOMMENDED TO BE AT LEAST ONE GAUGE HEAVIER THAN GUTTER STOCK.
3. ATTACH WOOD NAILER TO WALL/DECK WITH SUITABLE FASTENERS.
4. DESIGN GUTTER EXPANSION JOINTS PLACED AT APPROPRIATE INTERVALS COMMENSURATE WITH TYPE OF METAL.

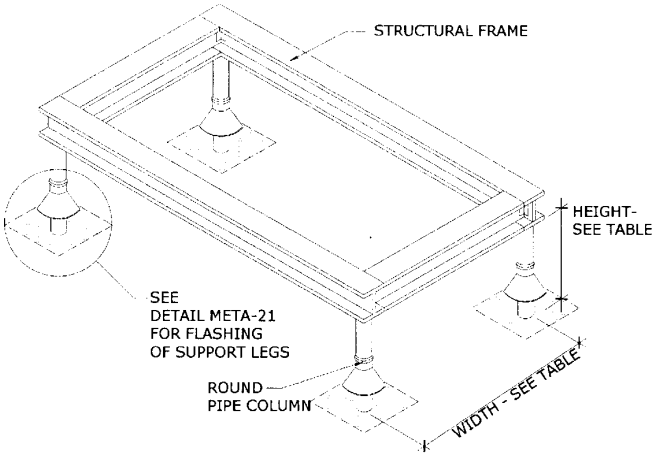
GUTTER META-24S

FIGURE 1—INSTALLATION DETAILS—(Continued)



NOTES:
1. THIS DETAIL ALLOWS FOR ROOF MAINTENANCE AROUND THE SUPPORTED EQUIPMENT. THE CONTINUOUS SUPPORT IS PREFERRED IN LIGHT-WEIGHT STRUCTURAL SYSTEMS THE EQUIPMENT WEIGHT CAN BE SPREAD ACROSS TWO OR MORE SUPPORTING MEMBERS. WHERE HEAVY STRUCTURAL SYSTEMS ARE USED OR WHERE THE LOAD CAN BE CONCENTRATED OVER A COLUMN, DETAIL META-12 MAY BE PREFERRED. A MINIMUM OF 2 FEET [610 mm] OF HORIZONTAL CLEARANCE MUST BE PROVIDED FOR REMOVAL AND REPLACEMENT CLEARANCE FROM ROOF SURFACE TO BOTTOM OF SUPPORTED EQUIPMENT SHOULD ALSO BE PROVIDED.
2. ATTACH NAILER TO DECK WITH SUITABLE FASTENERS.

EQUIPMENT SUPPORT CURB META-11

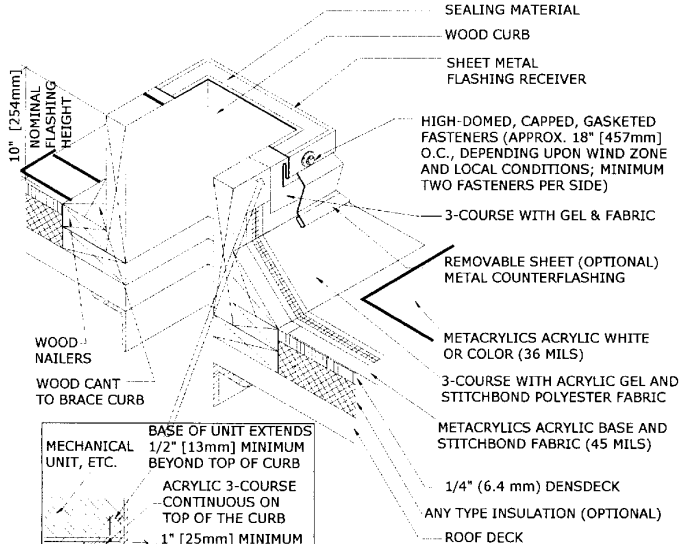


WIDTH OF EQUIPMENT	HEIGHT OF LEGS
UP TO 24" [UP TO 610mm]	24" [610mm]
25" TO 48" [635mm TO 1.2m]	36" [914mm]
48" AND WIDER [1.2m AND WIDER]	48" [1.2m]

NOTE:

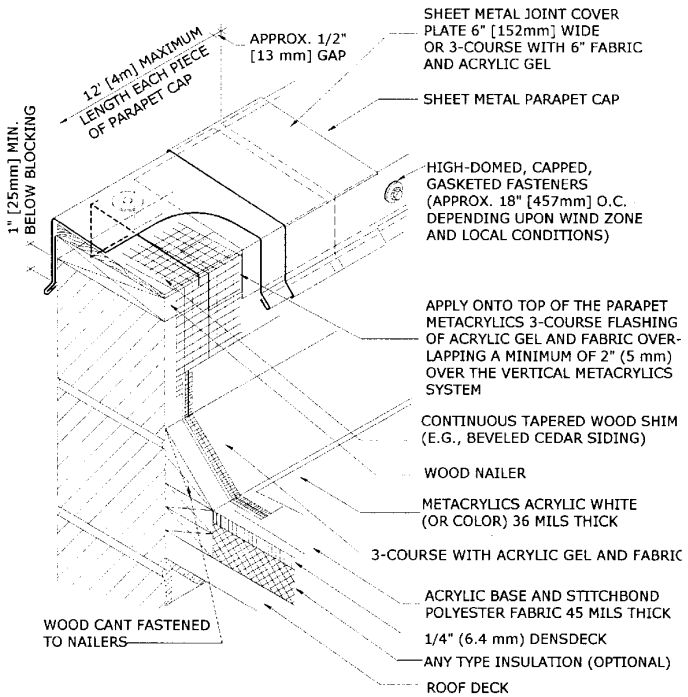
THIS DETAIL MAY BE PREFERABLE TO DETAIL META-11 WHEN THE CONCENTRATED LOADS CAN BE LOCATED DIRECTLY OVER COLUMNS OR HEAVY GIRDERS IN THE STRUCTURE OF THE BUILDING. THIS DETAIL CAN BE ADAPTED FOR OTHER USES, SUCH AS SIGN SUPPORTS.

EQUIPMENT SUPPORT STAND META-12



NOTES:
1. ATTACH NAILER TO DECK WITH SUITABLE FASTENERS.
2. WHEN POSSIBLE, THE MECHANICAL UNITS SHOULD NOT BE SET UNTIL THE ROOF MEMBRANE AND FLASHING HAVE BEEN INSTALLED.

RAISED CURB DETAIL FOR ROOFTOP AIR HANDLING UNITS AND DUCTS (JOB SITE CONSTRUCTED WOOD CURB) META-15



NOTES:
1. THIS DETAIL SHOULD BE USED ONLY WHEN THE ROOF DECK IS SUPPORTED BY THE WALL. DETAIL META-4 SHOULD BE USED FOR NON-WALL SUPPORTED DECK.
2. ATTACH NAILER TO DECK WITH SUITABLE FASTENERS.
3. OPTION: IF WOOD NAILERS ARE NOT USED, A FIBER CANT STRIP SET IN ACRYLIC GEL MAY BE USED.

METAL PARAPET CAP (COPING) AND BASE FLASHING META-8

FIGURE 1—INSTALLATION DETAILS—(Continued)