


**GAFMC RUBEROID® DESIGN LINE
GUIDE SPECIFICATION**

- C. Samples: Provide samples of insulation(s), fasteners and roll goods for verification of quality.
- D. Certificates: Installer shall provide written documentation from the manufacturer of their authorization to install the roof system, and eligibility to obtain the warranty specified in this section.

1.06 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: GAFMC shall provide a roofing system that meets or exceeds all criteria listed in this section.
- B. Installer's Qualifications:
 - 1. Installer shall be classified as a **Master Select**  contractor as defined and certified by GAFMC.
- C. Source Limitations: All components listed in this section shall be provided by a single manufacturer or approved by the primary roofing manufacturer.
- D. Final Inspection
Manufacturers representative shall provide a comprehensive final inspection after completion of the roof system. All application errors must be addressed and final punch list completed.

1.07 PRE-INSTALLATION CONFERENCE

- A. Prior to scheduled commencement of the roofing installation and associated work, conduct a meeting at the project site with the installer, architect, owner, GAFMC representative and any other persons directly involved with the performance of the work. The installer shall record conference discussions to include decisions and agreements reached (or disagreements), and furnish copies of recorded discussions to each attending party. The main purpose of this meeting is to review foreseeable methods and procedures related to roofing work.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver all roofing materials to the site in original containers, with factory seals intact. All products are to carry either a GAFMC or BMCA® label.
- B. Store all pail goods in their original undamaged containers in a clean, dry location within their specified temperature range.
- C. Store roll goods on end on pallets in a clean, dry, protected area. Take care to prevent damage to roll ends or edges. Do not double stack modified bitumen products.
- D. Do not expose materials to moisture in any form before, during, or after delivery to the site. Reject delivery of materials that show evidence of contact with moisture.
- E. Remove manufacturer supplied plastic covers from materials provided with such. Use "breathable" type covers such as canvas tarpaulins to allow venting and protection from weather and moisture. Cover and protect materials at the end of each work day. Do not remove any protective tarpaulins until immediately before the material is to be installed.
- F. Materials shall be stored above 55°F (12.6°C) a minimum of 24 hours prior to application.

1.09 PROJECT CONDITIONS

- A. Weather
 - 1. Proceed with roofing only when existing and forecasted weather conditions permit.
 - 2. Ambient temperatures must be above 45°F (7.2°C) when applying hot asphalt or water based adhesives.

**GAFMC RUBEROID® DESIGN LINE
GUIDE SPECIFICATION**

1.10 WARRANTY

- A. Provide Manufacturers standard Diamond Pledge™ Guarantee with single source coverage* and no monetary limitation, where the manufacturer agrees to repair or replace components in the roofing system, which cause a leak due to a failure in materials or workmanship.
1. Duration: Ten (10) years from the date of completion.

*Materials and workmanship of listed products within this section when installed in accordance with current GAFMC application and specification requirements. Contact GAFMC Contactor Services for the full terms and conditions of the guarantee.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

- A. GAF Materials Corporation - 1361 Alps Road, Wayne, NJ 07470

2.02 INSULATION

- A. Rigid polyisocyanurate board, with a strong white or black fibrous glass facer conforming to or exceeding the requirements of ASTM D 1289 / FS HH-I-1972, **EnergyGuard® Polyiso**, with the following characteristics:
1. Board Thickness: 1”
 2. Thermal Resistance (LTTR value) of: 6.0

2.03 ROOF BOARD

- A. Underlayment or overlayment board with a water-resistant and silicone treated gypsum core with glass fiber facers embedded on both sides, and pre-primed on one side. **GP Dens-Deck® Prime Roof Board**, distributed by BMCA®.
1. Board Thickness: ½”
 2. Thermal Resistance (R value) of: .56

2.04 INSULATION ACCESSORIES

- A. Cant Strip: Factory fabricated rigid perlite strip cut at angles to provide a true 45° Angle between horizontal and vertical surfaces, **EnergyGuard® Perlite Cant Strip**, by BMCA®
- B. Tapered Edge Strip: Factory fabricated rigid perlite strip cut at angles to provide a smooth transition between differences in elevation. **EnergyGuard® Tapered Edge Strip** by BMCA®

2.05 INTER-PLY SHEET

- A. Tough, resilient, smooth surfaced, asphalt modified bitumen membrane containing a core of non-woven polyester mat coated with flexible, SBS polymer-modified asphalt designed for heat weld application. Conforms to or exceeds requirements of ASTM D 6164 Type I Grade S. Each roll contains one square of material, approximately 39.4’ x 33.6’ (1 m x 10.3 m), 88 lbs. (46.4 kg), **RUBEROID® SBS Heat-Weld® Smooth**

2.06 MEMBRANE MATERIALS

- A. Premium, heavy-duty, fire-resistant, granule-surfaced asphalt modified bitumen membrane containing a core of non-woven polyester mat coated with flexible, SBS polymer-modified asphalt designed for heat weld application. Conforms to or exceeds requirements of ASTM D 6164 Type II Grade G. Each roll contains one

**GAFMC RUBEROID® DESIGN LINE
GUIDE SPECIFICATION**

square of material, approximately 39.4' x 33.6' (1 m x 10.3 m), 103 lbs. (46.7 kg), **Ruberoid® SBS Heat-Weld® Plus FR** roof membrane.

B. Color: Black

2.07 FLASHING MATERIALS

A. Tough, resilient, smooth surfaced, asphalt modified bitumen membrane containing a core of non-woven polyester mat coated with flexible, SBS polymer-modified asphalt designed for heat weld application. Conforms to or exceeds requirements of ASTM D 6164 Type I Grade S. Each roll contains one square of material, approximately 39.4' x 33.6' (1 m x 10.3 m), 88 lbs. (46.4 kg), **Ruberoid® SBS Heat-Weld® Smooth** base / ply sheet.

B. Premium, heavy-duty, fire-resistant, granule-surfaced asphalt modified bitumen membrane containing a core of non-woven polyester mat coated with flexible, SBS polymer-modified asphalt designed for heat weld application. Conforms to or exceeds requirements of ASTM D 6164 Type II Grade G. Each roll contains one square of material, approximately 39.4' x 33.6' (1 m x 10.3 m), 103 lbs. (46.7 kg), **Ruberoid® SBS Heat-Weld® Plus FR** roof membrane.

2.08 ACCESSORIES

A. Mechanical Fasteners

1. **Drill•Tec® Standard Roofing Fastener**: Alloy steel fastener with CR-10 coating with a .220" diameter thread: Factory Mutual Standard 4470 Approved, #3 Phillips truss head or hex head.
2. **Drill•Tec® 3" Galvalume® Plate**: Galvalume, 3" (7.5 cm) diameter, center hole .25" (inch), for use with Standard, Heavy Duty, CD-10, Fluted Nail or Toggle Bolt.

B. One Way Vents

Pressure relief device consisting of a one-piece spun aluminum vent pre-flashed with modified bitumen. Internally, the vent contains a neoprene valve that allows air pressure and moisture vapor to escape out of the system without allowing additional air and moisture vapor to return. The **One Way MVent**, by Mweld.

C. Standard Vents

1. A spun aluminum vent, pre-flashed with modified bitumen designed to waterproof soil pipes and roofing protrusions. The **Standard MVent**, by Mweld.
NOTE: Not for use over active pipes that emit steam or excessive moisture vapor, condensation may occur. Not for use over boiler or heater/furnace vent pipes.

D. Adjustable Vents

1. A two-piece roof-flashing unit consisting of a pre-flashed spun aluminum base and a flexible upper boot, allowing for waterproofing of tall or awkward roof protrusions. The **Adjustable MVent**, by Mweld.

E. Plumbing Vents

1. A pre-flashed with modified bitumen membrane and is designed to waterproof vent pipes. It can be used as a pipe cover to replace finger and cap flashing on standard vent pipe details. The **Pre-Flashed Plumbing Vent**, by Mweld.

F. Drains

1. A spun aluminum (or copper) roof drain with gravel guard, strainer cap, and waterproofing plumbing seal attached. Pre-flashed with modified bitumen and available in full and insert sizes to accommodate new construction and retrofit applications. The **MDrain**, by Mweld.
2. A Pre-flashed metal through-wall roof drain designed for easy installation to aid in quick lateral removal of water. The **Mscupper**, by Mweld.

**GAFMC RUBEROID® DESIGN LINE
GUIDE SPECIFICATION**

- G. Sealant Pans
 - 1. A structural urethane outer shell, bonded to the roof surface, filled with a urethane rubber sealant. The urethane sealant conforms to the shape of any roof penetration through a roof surface to protect the roof system from moisture. The **M-Curb** and **M-Thane**, by Mweld
- H. Expansion Joint Covers
 - 1. Factory fabricated assemblies used to accommodate three-dimensional joints in a roof structure. Heavy reinforced flexible cover with a flexible flame retardant foam bellows for support. Nailing flanges conform to curb irregularities. The **Metalastic Expansion Joint Cover**, by BMCA®.
- I. Gravel Guard
 - 1. Three-piece fascia system with roof flange design that creates water and wind proof seals at the building perimeter. The **Gravel Guard MB**, by BMCA®.
- J. Fire Resistant Pre-Treatment
 - 1. Liquid, temporary fire retardant treatment that is pre-mixed and comes ready to be brushed, rolled or sprayed on various roofing components prior to the application of the base sheet or the roofing membrane. Upon application in sufficient quantities to completely saturate wood surfaces, insulation, cant areas and other roofing components, including areas of penetration, the fire danger associated with the use of flame torches in the application of base sheets and/or modified bitumen membrane will be temporarily reduced. **FireshieldO**, by BMCA®

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that the surfaces and site conditions are ready to receive work.
- B. Verify that the deck is supported and secured.
- C. Verify that the deck is cleaned and smooth, free of depressions, waves, or projections, and properly sloped to drains, valleys, eaves, scuppers or gutters.
- D. Verify that the deck surfaces are dry and free of ice or snow.
- E. Verify that all roof openings, curbs, pipes, sleeves, ducts, vents or other penetrations through the roof are solidly set, and that all flashings are tapered.

3.02 SUBSTRATE PREPARATION

- A. Steel Deck
 - 1. Metal decks must be a minimum uncoated thickness of 22 gauge (0.8 mm) and shall have a G-90 galvanized finish on all panels.
 - 2. Decks must comply with the gauge and span requirements in the current Factory Mutual FM Approval Guide and be installed in accordance with Loss Prevention Data Sheet 1-28 or specific FM approval.
 - 3. When re-roofing over steel decks, surface corrosion shall be removed, and repairs to severely corroded areas made. Loose or inadequately secured decking shall be fastened, and irreparable or otherwise defective decking shall be replaced.
- B. Recover
 - 1. Suitable roofs for recover shall be free of dust, dirt, debris, and any contaminants that may adversely affect the performance of the new roof. Areas of substantial deck deflection or membrane imperfections shall be corrected prior to installing any new roofing.

**GAFMC RUBEROID® DESIGN LINE
GUIDE SPECIFICATION**

2. For recover installations over single-ply, fluid applied, coal tar and metal roofs, contact GAFMC Contractor Services for prior approval and technical requirements.
3. Taking test cuts to verify the existing roof construction and condition. Three test cuts should be made for roofs under 100 squares and one test cut per 100 squares above the minimum amount. It is highly recommended and in certain circumstances, required that a moisture survey be made to determine the extent of wet insulation and moisture entrapment. Contact GAFMC Contractor Services for more information on moisture surveys.
4. Proper drainage of the new roof system is required to eliminate ponding. Provisions must be made to insure the new roof system has proper drainage, i.e., placement of additional roof drains, use of tapered insulation, use of crickets, etc., as appropriate.
5. Existing substrates and insulation (if applicable) must be dry over the majority of the roof area. Wet or deteriorated areas of insulation and substrate must be removed and replaced with new materials. When adhering insulation or new roofing directly to the existing roof surface, the existing roof system components must be well attached to each other and their substrate.
6. All applicable code requirements must be met for recover over an existing roofing system.
7. When Stratavent® Eliminator™ Venting Base Sheet is used as the first ply, the surface of the old smooth membrane must be primed using Matrix™ 307 Asphalt/concrete Primer and allowed to dry. Install Stratavent® Eliminator™ Venting Base Sheet and the proper roof specification listed in this Manual.
8. GAFMC does not recommend partial recover or re-roofing of a single roof area due to the potential for defects in the portion of the roof system not replaced, to damage or negatively affect the performance of the new membrane. When required by project conditions or budget considerations, GAFMC requires full separation of the old and new roof areas by means of a full curb mounted expansion joint or area divider installed to provide a complete watertight seal or break between areas. Tie-in constructions, in which the old and new membranes are adhered directly to each other and stripped in are not acceptable.

3.03 INSTALLATION - GENERAL

- A. Install GAFMC's Ruberoid® roofing system according to all current application requirements in addition to those listed in this section.
- B. GAFMC Ruberoid Specification #: I-0-2-HGPFR
- C. When the slope of the roof is ½" per foot or greater, install all plies parallel with the slope of the roof, and install intermediate wood nailers as required for the specific roof slope. Plies must extend over ridges and nailed on 6" centers.
- D. Start the application of membrane plies at the low point of the roof or at the drains, so that the flow of water is over or parallel to, but never against the laps.

3.04 INSULATION - GENERAL

- A. Do not apply roof insulation or roofing until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment. A vapor retarder coated lightly with asphalt may be applied to protect the inside of the structure prior to the insulation and final roofing installation. Before the application of the insulation, any damage or deterioration to the vapor retarder must be repaired.
- B. Do not install wet, damaged or warped insulation boards.
- C. Install insulation boards with staggered board joints in one direction (unless taping joint).
- D. Install insulation boards snug. Gaps between board joints must not exceed ¼" (6 mm). All gaps in excess of ¼" (6 mm) must be filled with like insulation material.

**GAFMC RUBEROID® DESIGN LINE
GUIDE SPECIFICATION**

- E. Wood nailers must be 3-1/2" (8.9 cm) minimum width or 1" (25 mm) wider than metal flange. They shall be of equal thickness as the insulation with a minimum 1" (25 mm) thickness. All nailers must be securely fastened to the deck.
- F. Do not kick insulation boards into place.
- G. Miter and fill the edges of the insulation boards at ridges, valleys and other changes in plane to prevent open joints or irregular surfaces. Avoid breaking or crushing of the insulation at the corners.
- H. Do not install insulation over old lightweight insulating concrete decks without the use of a vapor retarder. Insulation should not be installed over new lightweight insulating concrete.
- I. Cant strips must be installed at the intersection of the roof and all walls, parapets, curbs, or transitions approaching 90°, to be flashed. They shall be approximately 4" (10.2 cm) in horizontal and 4" (10.2 cm) in vertical dimension. The face of the cant shall have an incline of not more than 45 degrees with the roof.
- J. Roof tape, if required over insulation joints, must be laid evenly, smoothly and embedded in a uniform coating of hot steep asphalt with 4" (10.2 cm) end laps. Care must be taken to assure smooth application of tape, and full embedment of the tape in the asphalt.
- K. Do not install any more insulation than will be completely waterproofed each day.

3.05 INSULATION – BASE LAYER

- A. Loose apply the base layer of insulation for subsequent layers of insulation to be simultaneously attached. Minimal fastening should be performed to avoid movement of the boards.

3.06 INSULATION – SUBSEQUENT LAYERS

- A. The insulation must be securely attached to the roof deck. A minimum FMRC 1-60 attachment is recommended. Refer to FMRC Approval Guide for FM fastening patterns. Factory Mutual requires fastener density increased in corner areas for FM 1-60 and perimeter, and corner area fastener density increases for FM 1-90 or greater. Refer to FM Loss Prevention Data Sheets 1-7, 1-28, and 1-49.
- B. Multiple layers of insulation of the same, non-tapered insulation material may be simultaneously mechanically fastened with approved fasteners and plates through the top layer of insulation to the structural deck. Individual layers of insulation must not exceed 3" (7.6 mm) in thickness nor total thickness of all layers should not exceed 5" (12.7 cm) without written approval of GAFMC Contractor Services.
- C. Use only fasteners with a minimum 3 inch (7.6 cm) stress plate when mechanically attaching insulation. Do not attach insulation with nails.

3.07 PLY / CAP SHEET

- A. The surface over which the membrane is to be installed must be clean, smooth, dry and prepared in accordance with article 3.02 "*Substrate Preparation*". Do not apply membrane directly to a fresh asphalt glaze or flood coat, or over base plies with excessive asphalt mopping bleed out at laps.
- B. For slopes 3/4 " per foot (6.2 cm per meter) and over, membrane must be run parallel to the roof slope and back nailed in accordance with GAFMC steep slope application requirements. On slopes less than 3/4" per foot (6.2 cm per meter), install cap sheet perpendicular to the slope.
- C. Never apply membrane by any method except welding with a propane torch or other equipment specifically designed for application of torchable modified bitumen.

**GAFMC RUBEROID® DESIGN LINE
GUIDE SPECIFICATION**

- D. The coiled membrane must be unrolled approximately 10 ft. (3 meters), and aligned. The propane torch flame is then applied uniformly across the exposed back surface of the membrane and lap areas until the compound reaches the proper application temperature and exhibits a slight sheen. A complete burn-off of release films where present on the underside of the rolls, membrane selvage edges or both surfaces is necessary. Avoid overheating which may result in damage to or improper adhesion of the membrane. (The flame should be moved from side to side in the shape of an “L”, applying about 75% of the heat to the membrane and 25% to the substrate or underlying plies including the lap area of the previously installed courses.) The membrane is slowly unrolled as heat is applied to ensure proper adhesion. When complete, re-roll the opposite end of the membrane and install in the same manner.
- E. A minimum 3/8” (10 mm) bitumen flow-out must be obtained at all seam areas. Dry laps are not acceptable. To ensure the proper 3/8” (10mm) flow of bitumen at the seam areas, a roller may be used. Roller application should follow behind the torch no more than 4 ft. (1.2 m) nor less than 3 ft. (0.91 m) to be sure that the membrane will be at the proper temperature to produce proper flow. Hand rollers or “walking-in the seam” methods are also acceptable. Check all seams for full and uniform adhesion. Un-adhered seams must be lifted with a heated trowel and resealed by lightly torching the seam area.
- F. All end laps must be staggered a minimum of 18” (45.7 cm) so that no adjacent end laps coincide. If end laps fall in line or are not staggered the proper distance, a full width of membrane must be installed over the end laps. End laps, flashing sheets and other seams formed over granule surfaces require pre-heating of the top surface of the underlying granule surface membrane to a point where the granules just begin to sink into, and the modified bitumen compound comes up through the granules to ensure proper seam construction and adhesion.
- G. All laps must be parallel or perpendicular to the slope of the roof such that the flow of water is never against the lap.
- H. Interply and cap application: Over the base sheet or approved substrate, install 19 11/16” (50 cm) and 39 3/8” (100.0 cm) width Ruberoid® smooth starter plies, and follow with a 39 3/8” (100.0 cm) width granule surfaced sheet, applied shingle style. Lap plies 3” on side laps and 6” (15.2 cm) on end laps. Stagger adjacent end laps a minimum of 18” (45.7 cm).

3.08 BITUMINOUS BASE FLASHINGS

- A. Install GAFMC base flashing specification 2XHH over all cant strips, horizontal to vertical transitions, roof edges and roof penetrations. Flashings are to be secured in accordance with current GAFMC application guidelines.
- B. Nailable curbs and walls must be covered with a layer of approved GAFGLAS® Base Sheet or backer ply fastened 8” (20.3 cm) o.c. in all directions with approved fasteners. All vertical laps shall be 4” (10.2 cm). Base sheet or backer ply must extend out onto the field of the roof as shown in the applicable GAFMC construction detail.
- C. Prime all metal and masonry surfaces with asphalt primer, and allow adequate drying time prior to adhering flashing plies.
- D. Backer plies installed over masonry or other non-nailable substrates must be cut into manageable lengths to ensure adequate adhesion to the cant strip and vertical surfaces without excessive voids. All vertical laps shall be 4” (10.2 cm). Backer plies shall extend onto the field of the roof as shown in the applicable GAFMC construction detail.

**GAFMC RUBEROID® DESIGN LINE
GUIDE SPECIFICATION**

- E. The finished ply of base flashing shall be run vertically to provide a selvage edge that will aid in achieving proper adhesion at the 3" (7.6 cm) vertical laps. If the sheet is run horizontally, the vertical laps must be a minimum of 6" (15.2 cm) and the selvage edge must be removed from the sheet or fully covered by the counterflashing. The finished flashing ply must extend out onto the field of the roof as shown in the applicable GAFMC construction detail, and must be extended a minimum of 4" (10.2 cm) beyond the edge of the prior flashing plies. The flashing must be soundly adhered to the parapet, cant area and roof surface to result in a minimum void, non-bridging construction.
- F. Base flashing heights must be a minimum of 8" (20.3 cm) and a maximum of 24" (61.0 cm) above the roofline.
- G. Corner membrane flashings, such as "bow ties" for outside corners and "footballs" for inside corners or other membrane reinforcements are required to ensure that base flashing corners are sealed at cant areas. An alternate method of corner reinforcing is to install a smooth MB membrane reinforcement piece on the prepared corner substrate prior to final surfacing membrane. Refer to MB Flashing Details section of the *GAFMC Application and Specifications Manual*.

3.09 ROOF PROTECTION

- A. Protect all partially and fully completed roofing work from other trades until completion.
- B. Whenever possible, stage materials in such a manner that foot traffic is minimized over completed roof areas.
- C. When it is not possible to stage materials away from locations where partial or complete installation has taken place, temporary walkways and platforms shall be installed in order to protect all completed roof areas from traffic and point loading during the application process.
- D. Temporary tie-ins shall be installed at the end of each workday and removed prior to commencement of work the following day.

3.10 CLEAN-UP

- A. All work areas are to be kept clean, clear and free of debris at all times.
- B. Do not allow trash, waste, or debris to collect on the roof. These items shall be removed from the roof on a daily basis.
- C. All tools and unused materials must be collected at the end of each workday and stored properly off of the finished roof surface and protected from exposure to the elements.
- D. Dispose of or recycle all trash and excess material in a manner conforming to current EPA regulations and local laws.
- E. Properly clean the finished roof surface after completion, and make sure the drains and gutters are not clogged.
- F. Clean and restore all damaged surfaces to their original condition.

END OF SECTION