

SPECIFICATION: GUIDE SPECIFICATIONS

FLEXIBLE SHEET ROOFING C3 MECHANICALLY FASTENED

PART 1 -- GENERAL

1.01 DESCRIPTION

- A. This guide specification describes typical application methods for a mechanically fastened C3 (tri-polymer alloy) single ply roof system. Contact the Technical Department of Republic Powdered Metals, Inc. (Republic) for information not contained in this document. All C3 roof systems are eligible for a warranty provided they are inspected by an authorized Republic agent and meet all the requirements of Republic in accordance with current Republic publications, specifications, pre-installation information form and drawings.
- B. This system is designed for commercial/industrial applications in new roofing, replacement, and recovering on substrates that have been accepted by Republic. C3 roofs are not to be installed on residential construction.
- C. Applications that involve known, severe exposures require a complete review by Republic Powdered Metals, Inc., before their acceptance. This includes, but is not limited to, unusual building exposure to wind, unusual roof slope, unusual roof use, unusual exposure to contaminants, openings in the structure (greater than 10% of the wall surface), which could be left open in a storm, roofs subject to positive pressure conditions and roofs greater than 45' in height. For roofs subject to special job conditions, contact the Republic Technical Service Department.
- D. Related Work
 - 1. Sheet Metal
 - 2. Concrete
 - 3. Sealants and Caulking
 - 4. Plumbing
 - 5. Masonry
 - 6. Carpentry
 - 7. Curtain Wall
 - 8. HVAC
 - 9. Electrical

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1.02 SCOPE OF WORK

- A. The roofing contractor shall furnish and install a mechanically fastened C3 roofing membrane as described in this guide specification and in accordance with the Republic drawings.

1.03 QUALITY ASSURANCE

- A. The roofing system shall be installed by a commercial roofing contractor that has been trained by Republic or has previously installed a warranted C3 Roofing System.
- B. There shall be no deviations made from those specifications or the Republic drawings without the prior written approval of the Republic Technical Department.
- C. Application code or insurance requirements shall be identified by the owner or his representative.
- D. Upon completion of the installation, the Technical Department of Republic shall inspect the completed roof to verify that the visible elements of the installation have been installed in accordance with Republic specifications, detail drawings and approved changes.

*At a minimum, projects must be installed as per Republic specifications. Projects with written specification, which are more stringent than Republic must be adhered to.

1.04 SUBMITTALS

- A. The contractor shall complete and submit the project notice of award form to the Republic Technical Department for approval. No material will be shipped to the contractor until this information is received and approved. Projects installed without prior acceptance of a Republic notice of award form are not eligible for a Republic warranty.
- B. At the time of bidding, the roofing contractor shall submit to the Owner's representative the following:
 - 1. Copies of specifications and details.
 - 2. Samples of each material to be used in the roof system including each component manufacturer's literature.
 - 3. Written approval by insulation manufacturer (as required) for use and performance of the product in the proposed system.
 - 4. Dimensioned shop drawings required by the project specifications shall be accepted by the Republic Technical Department prior to submittal.
 - 5. Written verification from Republic that the contractor is an authorized applicator.

6. Submit certification that the system to be installed meets specified code/insurance requirements. Information can be obtained from Republic Powdered Metals, Inc.
7. Submit results of pull-out tests to confirm the ability of the desk to retain mechanical fasteners.
8. Submit, for approval, any necessary items not furnished by Republic. Only items that have written approval from the Republic Technical Department will be accepted.

1.05 PRODUCT DELIVERY STORAGE AND HANDLING

- A. Materials shall be delivered in their original, unopened containers.
- B. All products shall be delivered to the job site with the manufacturers' labels on each roll or container. When required, the label shall also indicate the specified code/insurance approvals.
- C. All materials shall be stored flat, elevated from the roof or deck, protected with waterproof covers as necessary to keep the materials dry. The plastic wrap on the C3 rolls is not intended for use as a waterproof cover.
- D. C3 contact bonding adhesive shall be stored at temperatures above 40°F. All flammable materials, such as C3 seam sealer and contact adhesive, shall be stored in a cool, dry area away from sparks and open flames.
- E. All materials shall be protected from damage.
- F. Materials damaged in handling or storage shall not be used without authorization by Republic. Unsalvageable materials shall be replaced at the contractor's expense.
- G. Material Safety Data Sheets, available from Republic, shall be reviewed.

1.06 JOB CONDITIONS

- A. C3 roofing systems shall not be installed during periods of precipitation. C3 membrane may be installed under certain adverse weather conditions (temperature and humidity), contact the Technical Department for precautions that should be followed.
- B. Only as much of the new roofing as can be made weathertight each day shall be completed in accordance with the Republic specifications including all field flashings.
- C. All work shall be scheduled and executed without exposing the interior building area(s) to the effects of inclement weather. The existing building and its content shall be protected against all risks associated with the installation of the roof system.
- D. All surface areas to receive new insulation, membrane or flashings shall be thoroughly dry. Should surface moisture occur, contractor shall provide necessary materials and equipment to dry the surface area effected prior to installation.

- E. All areas contaminated by dirt, debris and dust shall be cleaned from surfaces by vacuuming, sweeping or power blowing.
- F. The roofing contractor shall take measures necessary to avoid damage to the C3 System during construction. When the roofing contractor is a subcontractor he shall advise the general contractor concerning potential damage to the C3 System and the measures to be taken to avoid such damage during construction.
- G. When storing material on the roof and during application, the roofing contractor shall ensure that overloading of the deck and structure does not occur.
- H. Temporary waterstops shall be installed at the end of each day's work, and shall be removed before proceeding with the next day's work. Waterstops shall be compatible with all materials and shall not emit dangerous or incompatible fumes.
*Water tightness of the waterstops is the contractor's responsibility.
- I. Any deteriorated deck or flashing substrate which is discovered shall be promptly reported to the owner or his designated representative.
- J. The roofing contractor shall investigate all existing roof drain lines. Nonfunctioning drains shall be reported to the owner's representative prior to job start. It is the responsibility of the roofing contractor and Owner to ensure adequate connection of the drain to the drain lines.
- K. The roofing contractor shall investigate the structural deck on the building to determine the type and length of fastener required. Gypsum concrete and cementitious wood fiber decks require fastener pull-out tests, contact Republic for additional information.
- L. If waste products, petroleum, grease, oil, solvents, mineral oil and other contaminants come into contact with the C3 roofing membrane, contact Republic for precautions and cleaning procedures.
- M. Site cleanup, including both interior and exterior building areas that have been affected by the roof installation, shall be completed to the Owner's satisfaction. All landscaped areas affected shall be raked clean and seeded, as required.
- N. All roofing, insulation, flashings and metal work removed during construction shall be immediately removed from the site to be regulated legal dumping area authorized to receive such materials.
- O. Certain project conditions may require some modifications to this specification. Contact the Republic Technical Service Department if any of the following conditions exist.
 1. Roof heights greater than 45 feet.
 2. Geographical location in a 100 mph or greater wind zone, per FM's Loss Prevention Data Sheet 1-28S.

1.07 HAZARDOUS MATERIALS HANDLING

- A. It shall be the responsibility of the contractor and Owner to identify, test and isolate all areas of existing roof membrane and base flashings containing possible hazardous materials (Asbestos type).
- B. The roofing contractor shall remove all such materials and dispose of in accordance with all Federal (EPA & OSHA), State and local regulatory agencies under an approved certified abatement program. All contractor's employee's shall be instructed and follow OSHA guidelines for handling such materials under the provisions of HCS (Hazardous Communications Standard) as required to conform to OSHA and other safety requirements.

1.08 WARRANTY

- A. Upon completion of the roof system, and after passing a final inspection performed by the Republic Technical Department, a warranty shall be issued, effective from the date of substantial completion. Any project which was eligible for warranty, but was not warranted within one year of completion, must be reinspected by Republic prior to issuance of the warranty.*

*Only those materials supplied by Republic will be warranted.

*Projects which have exceeded this one year period may not automatically qualify for a warranty any longer.

1.09 BIDDING REQUIREMENTS

- A. Prebid conference: A prebid conference shall be held with a representative of the Owner and all parties and trades involved to discuss all aspects of the project. The contractor's field representative and/or foreman for the project shall be in attendance.
- B. All bidders shall visit the site and carefully examine the areas in question as to conditions that may affect the proper execution of the work. All dimensions and quantities shall be determined or verified by the contractor. No claims for extra costs shall be allowed for lack of full knowledge of existing conditions.

PART II -- PRODUCTS

2.01 GENERAL

- A. All components of the C3 roofing system shall be either manufactured, supplied, or accepted in writing by Republic's Technical Department.

2.02 MECHANICALLY FASTENED TRI-POLYMER ALLOY MEMBRANE

- A. The membrane shall be C3, a Tri-polymer Alloy, polyester reinforced roofing system as distributed by Republic Powdered Metals, Inc., 3735 Green Road, Beachwood, Ohio. The sheet shall conform to the following physical properties described below:

- 1. Color White : (top)/Grey/(bottom)

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2. Roll Size: 78" wide x 108' long
3. Weight: 4.5 oz./ft² (nominal)
4. Thickness ASTM D-751 : 40 mil (nominal)
5. Breaking Strength (minimum, lbs/in.) ASTM D-751 (Grab method) : 300 x 200 lbs.
6. Seam Strength (minimum, % of breaking strength) : ASTM D-638 : 90%
7. Elongation @ Break (minimum, %) ASTM D-751 : 17% x 19%^①
8. Heat aging (minimum, %) ASTM D-3045 : 80% x 80%^①
9. Tear Strength (minimum, lbs.) ASTM D-751 (Tongue Method) : 100 x 100 lbs.^①
10. Low Temperature Bend ASTM D-2136 : PASS (-40°)
11. Permeance ASTM E-96 (Procedure BW) : 0.003 Perms
12. Dimensional Change (maximum %) ASTM D-1204 (@ 176° F, 6 hrs) : 0.3%
13. Dimensional Change (maximum %) ASTM D-1204 (@ 212° F, 1 hr) : 1.0%
14. Water Immersion (wght. change, Max %) ASTM D-570 (@ 158° F, 1 week) : 1.0%
15. Hydrostatic Resistance (min, psi) ASTM D-751 (method D) : 400 psi
16. Ozone Resistance ASTM D-1149 : PASS
17. EMMAQUA[®] Test, DSET ASTM E-838 : PASS (2.7 million Langleys)

①This data is reported in Warp X Fill values.

Note: The physical properties listed above are typical values achieved in the manufacture of the "C3" membrane, for specific minimum specification values contact Republic.

EMMAQUA[®] Test Method is a registered tradename of DSET Laboratories, Inc.

2.03 RELATED MATERIALS

A. FLASHINGS

1. C3 Membrane Flashing: C3 Membrane.
2. C3 Coated Metal: 0.20" thick membrane laminated to 24-gauge G-90 galvanized steel with acrylic backwash coating.
3. C3 Prefabricated Flashings: Vent pipe boots, inside corners, outside corners.

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- B. Flashing Adhesive: C3 Contact Adhesive.
- C. Sealants: One part polysulfide or one part polyurethane.
- D. Seaming Procedure: Hot air and/or solvent welding, contact Republic for acceptable equipment and methods.
- E. Night Seal: Roofing cement or hot asphalt.
- F. Mechanical Termination: C3 coated metal or approved plates and screws.
- G. Surface Mounted Reglet: C3 extruded aluminum reglet and joint covers.
- H. Foam Rod Stock: Polyethylene or neoprene in shapes and sizes as needed.
- I. Vapor Retarder: The necessity and type of vapor retarder shall be determined by the Architect or Consulting Engineer.\
- J. Insulation: Type and thickness must be accepted by Republic. Fiberglass, Fiberboard or Perlite shall not be used without prior written acceptance by Republic.
- K. Sheet Metal Fasteners: Galvanized ring shank nails, min. 1-(inch) penetration into wood.
- L. Membrane Plates: Approved 2-inch metal barbed plate or nylon reinforced barbed plate.
- M. Insulation Plates: Approved 3-inch diameter galvanized metal plates or plastic locking plates.
- N. Thermal Barrier: Apply to structural deck as needed to meet applicable code or insurance requirements.
- O. Wood Nailers: Minimum #2 lumber, "wolmanized" or pressure treated for rot resistance with a salt-based preservative. No creosote or asphaltic type preservatives shall be allowed.
- P. Roof Traffic Pads: C3 Walkway.

PART III – EXECUTION

3.01 PRE-JOB

- A. The primary contractor, the owner or the owner's representative shall conduct a pre roofing conference before any work begins, so all parties involved in the installation of the roofing system construction, or who may work on or through the roofing system, understand their obligations with respect to the roofing membrane.

3.02 SUBSTRATE INSPECTION

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- A. A proper substrate shall be provided to receive the mechanically fastened C3 roof system. Contact Republic for acceptable substrates. The roofing contractor shall notify the owner or architect in writing of any defects in the substrate. Work shall not proceed until the substrate has been repaired or replaced. It is the responsibility of the owner, or the owner's representative, to ensure the structural integrity of the roof deck.
- B. Remove all loose debris from the surface.
- C. The roof shall be free of standing water, ice, or snow.
- D. Structural concrete decks shall have a minimum cure of 28 days.

3.03 SUBSTRATE PREPARATION

- A. New construction or retrofit projects that involve removal of the existing membrane and insulation.
- B. Building codes may require a thermal barrier between the roof deck and some roof insulations.
- C. Surfaces on which the C3 membrane is to be applied shall be compatible, clean, smooth, free of fins, sharp edges, loose and foreign material, oil, grease, and bitumen.
- D. When possible, work shall begin at the highest point of the roofing project area and proceed to the lowest point. All seams should be shingled with, or run parallel to, the flow of water. (Perimeter sheets may not always meet this requirements if the roof drains to the perimeter.)
- E. All loose gravel shall be removed or leveled. If necessary, accumulations of bitumen, adhered gravel or other irregularities shall be scratched and removed so as to produce a flat, smooth surface. Insulation boards shall lay flat from one board to another.
- F. All areas of wet insulation shall be removed and replaced.

3.04 VAPOR RETARDER

- A. The roofing system may require a vapor retarder, depending on the moisture occupancy combined with the seasonal temperature variations, to prevent moisture accumulations from condensation. The design professional shall determine the necessity for and the replacement of the vapor retarder within the C3 roof system assembly.

3.05 WOOD NAILERS

- A. Treated wood nailers shall be installed at the perimeter of the roof and around other projections and penetrations that are to be flashed with C3 coated metal.
- B. Nailers shall be securely anchored to the deck to resist 300 lbs. per foot applied in any direction.
- C. The thickness of the nailer shall be provided such that the top of the nailer is flush with the surface to which the C3 membrane is to be applied.

C3 Membrane

**Republic Powdered Metals,
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Revised 01/2002**

3.06 INSULATION

- A. The insulation manufacturer shall agree that the use of its product below the mechanically fastened C3 membrane is appropriate. It is the responsibility of the roofing contractor to ensure appropriate selection of the specific brand of insulation for use under the C3 membrane. Consult Republic for information concerning generic insulations which are appropriate for use under the C3 membrane.
- B. Insulation shall be installed according to the insulation manufacturer's instructions. This includes board layout, number of fasteners required to attach the insulation board and the pattern of these fasteners.
- C. Insulation shall be adequately supported to sustain normal roof traffic without damage.
- D. Insulation boards shall be installed in parallel courses with end joints staggered and adjacent boards butted together with no joints greater than 1/8".
- E. Where field trimmed, insulation shall be fitted tightly around roof protrusions and terminations.
- F. Insulation Attachment: Insulation boards shall be secured to the roof deck, using approved galvanized metal plates and #12/#14/#15 Universal coated screws or approved toggleless fasteners. Each board shall be fastened with the number of fasteners and with the pattern required by the insulation manufacturer, building insurance codes, or Republic requirements, whichever is more stringent.
- G. Tapered insulation boards shall be installed in accordance with the insulation manufacturer's shop drawings.
- H. No more insulation shall be applied than can be covered with the finished C3 membrane by the end of the day or the onset of inclement weather.
- I. Republic Powdered Metals, Inc., assumes no responsibility for the performance of the roof insulation(s) boards.

3.07 FASTENERS

- A. Use only approved fasteners or a substitute approved in writing by Republic.
- B. Fasteners shall be given perpendicular to the work surface.
- C. The following guidelines provide the appropriate uses for approved fasteners:
 - 1. Universal fasteners [#12/#14 coated screw]: steel decks – 24 gauge, or heavier, wood – 15/23 inch min.
 - 2. Universal fasteners [#15 coated screw]: structural concrete – 2500psi compressive strength min., concrete, brick masonry or steel and/or wood – decks requiring fasteners over 8.0 inches.

C3 Membrane

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3. Toggleless fasteners ["NTB" Type]: Gypsum or structural wood fiber plank-fastener pullout test results must be submitted for approval and spacing requirements.
 4. "SFS" fasteners and plates: Contact Republic Technical Department for approved uses.
 5. For all other deck types not included in this specification, contact the Republic Technical Department.
- D. The length of the fasteners shall be sufficient to penetrate the structural deck as required by Republic Technical Bulletin #2000.
- E. Concrete, gypsum and cementitious/wood fiber decks require pilot holes before driving the fastener into the deck. Contact Republic for recommendations and installation procedures.
- F. Fasteners that are improperly installed shall be removed or corrected. Improper application may be characterized as:
1. Overdriven: Fastener is driven to the point that it is causing the stress distribution plate to become concave or has stripped the deck and is no longer engaged.
 2. Underdriven: Fastener head is not properly seated on the metal stress plate or is not snapped into the locking position when using the locking plate.
 3. Snapped: Fastener breaks under the driving load.
 4. Bent: Fastener is bent to the point that it adversely affects the installation.
 5. Not Engaged: Fastener is improperly located or of insufficient length.

3.08 C3 COATED METAL FLASHINGS

- A. Fabricate and install C3 coated metal to comply with details and project drawings. Follow recommendations of SMACNA Sheet Metal Manuals for fabrication.
- B. All gravel stops and drip edges shall be installed using a 22-gauge hook strip fastened 12" o.c., when fascia exceeds 4" in width.
- C. Fasten C3 coated metal flashings 4" o.c. to treated wood nailers using galvanized annular ring nails.
- D. Install C3 coated metal flashings prior to the installation of the C3 membrane. Flange of flashing component shall be at the same level as the insulation or other substrate to which the membrane will be applied.
- E. Install adjacent pieces of coated metal flashings with a ¼" gap. Apply a 2" wide strip of duct tape continuous over the gap to act as a bond breaker. Hot air weld a 6" strip of C3 membrane, over the duct tape, to each piece of flashing to form a watertight splice.
- F. Fasten the top of C3 coated metal base flashing 8" o.c. using fasteners appropriate for the underlying substrate.

C3 Membrane

**Republic Powdered Metals,
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Revised 01/2002**

3.09 MEMBRANE INSTALLATION

A. PLACEMENT:

1. The C3 membrane shall be mechanically fastened to the structural deck. Refer to Technical Bulletin #1000 for fastening requirements into different deck types.
2. The perimeters and corners may require additional design consideration to develop the necessary resistance for wind conditions in excess of gale force winds. Contact the Technical Department of Republic for additional information if the building is located where winds may exceed standard warranty conditions or special code provisions are required.
3. The membrane shall be cut to fit neatly around all penetrations and roof projects.
4. The roofing membrane shall be unrolled and positioned with a minimum 4 ½" overlap. Laps shall be shingled with, or run parallel to the slope of the roof.

B. ATTACHMENT

1. The C3 membrane is secured using approved plates and universal fasteners [#12/#14 or #15], approved toggleless fasteners, approved "ES" pre-assembled plates and screws or "SFS Stadler" plates and screws.
2. The spacing of the fasteners used to secure the C3 membrane sheets, prior to welding the seams, is dependent on the type and thickness of the deck on the structure to be roofed. Refer to Technical Bulletin #1000 to determine the fastening requirements for the project.
3. Contact the Republic Technical Department for fastening requirements for decks that are not listed on Technical Bulletin #1000.
4. Secure the membrane with fasteners and plates around curbs and other penetrations with the same fastener spacing used to secure the perimeter sheets as called for in Technical Bulletin #1000.
5. Position all perimeter sheets (39" wide) parallel to the edges of the area to be roofed.
6. Position and secure the edge of each field sheet prior to welding the adjacent sheet to it.
7. Secure the membrane at all angle changes in the substrate using the same spacing used for the perimeter sheets. This procedure is required regardless of the cause of the angle change.

C. SEAMING:

1. The overlapping sheets shall be welded using hot air welding equipment. The areas must be dry and must be clean. The contractor must ensure that dirt or debris does not interfere with the seaming process.

C3 Membrane

**Republic Powdered Metals,
Inc.
Revised 01/2002**

2. The equipment settings and alignments must be checked continuously during each day to ensure complete fusion within the welded area and a smooth, wrinkle-free seam. Refer to the C3 installation guide for procedures.
3. Welds using the automatic welder shall be a minimum of 1 1/2" wide.
4. All hand welds shall be a minimum of 2" wide.
5. Membrane to C3 coated metal seams can be welded using an automatic welder or hand held equipment. Minimum seam widths as outlined above must be followed. Fasteners that secure the coated metal flashing shall not be located within the seam. Provide sufficient flange width (min. 5.0") on all flashings to allow for this requirement. Automatic welder settings will differ from membrane to membrane settings when welding membrane to coated metal.
6. The seams shall be checked for continuity and integrity. All imperfections must be corrected.

D. MEMBRANE TERMINATION AND SECUREMENT:

1. The C3 membrane shall be secured at all terminations at the perimeter of each roof level,
roof section, curb flashing, skylight, expansion joint, rising wall, penthouse.
2. Securement shall be provided at all angle changes in the deck (changes in roof plane) or insulation taper: inside angles more than 1" per foot from the plane of the roof, ridge angles that exceed 1" per foot total angle change.
3. Securement shall be achieved using C3 coated metal flashing, adequately fastened to treated wood nailers, or approved fasteners (and plates) spaced according to deck type. See Technical Bulletin #1000.
4. All terminations and fasteners shall be sealed within a lap or covered with a strip of C3 membrane, its perimeter continuously welded to the field sheet.

3.10 MEMBRANE FLASHINGS

- A. All flashings shall be installed as shown on the detail drawings. All C3 membrane flashing shall be installed concurrently with the roof membrane as the project progresses. No temporary flashings shall be allowed without prior written approval of the Republic Technical Department. If any water is allowed to enter the new roofing due to incomplete flashings, the affected area shall be removed and replaced at contractor's expense.
- B. Flashings shall not be applied over existing thru-wall flashings or weep holes. All flashings shall extend a minimum of 8-inches above roof level unless previously accepted by Owner's representative and the Republic Technical Department.
- C. All C3 membrane base flashings shall be adhered to a dry, smooth, solvent resistant and compatible substrate using C3 Contact Flashing Adhesive.

C3 Membrane

**Republic Powdered Metals,
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Revised 01/2002**

1. Over the properly installed and prepared surface, C3 Contact adhesive shall be applied using approved solvent resistant rollers. The adhesive shall be applied at a rate of approximately 50 to 100 sf per gallon dependent upon substrate material. The adhesive shall be applied in smooth even coatings with no globs, puddles, voids or similar irregularities. Only areas that can be completely covered in the same day shall be coated with adhesive. The surface with adhesive coating shall be allowed to completely dry prior to installing the membrane flashing. NOTE: Drying time of adhesive increases with presence of higher humidity or cooler temperature.
 2. When the surface is dry, C3 membrane flashing shall be cut to proper width and length and underside coated evenly with C3 Contact adhesive at a rate of approximately 50 sf per gallon. When the adhesive has dried sufficiently to produce strands when touched with a dry finger, the coated membrane shall be rolled carefully onto the previously prepared substrate taking care to avoid wrinkles. DO NOT allow adhesive on underside of the C3 membrane to dry completely.
 3. No contact adhesive shall be applied to lap (seam) areas that are to be welded to flashings or adjacent membrane sheets by means of hot-air and/or solvent welding procedures.
 4. Care should be taken to ensure that the flashing does not bridge where there is a change of direction.
- D. The top of the installed flashing shall be fastened under metal counterflashing, coping cap, or through metal reglet. The maximum distance between fasteners for C3 flashings shall be 8" through flat bar or 12" through metal reglet. Expansion pins with nylon sheaths set in predrilled holes shall be utilized to secure flashings to masonry and concrete surfaces.
- E. The metal reglet shall be caulked with polysulfide or polyurethane sealant supplied by others. The sealant, which is applied to the top of the reglet, will require periodic maintenance to check and renew the seal.

3.11 C3 COATED METAL FLASHINGS

- A. All flashings, other than C3 membrane, shall be fabricated out of C3 Coated Metal. Metal used other than C3 coated metal is not covered under the provisions of the warranty.
- B. All metal work shall be completed in conjunction with the roofing and flashing operation so as to provide a daily watertight condition.
- C. Metal shall be installed to provide adequate resistance to bending and to allow for normal thermal expansion and contraction. Allow for normal $\frac{1}{4}$ " space between metal joints.
- D. Metal flashings shall have a 5.0-inch minimum nailing flange and hemmed metal edge. Metal flashing shall be fastened to solid wood blocking with fasteners of the same type, annular ring nails, 4.0-inches on center. Fasteners shall penetrate the wood a minimum of 1".
- E. Metal hook strips, (22 gauge galvanized), are required if metal fascia exceeds 4.0-inch in width. Each hook strip shall be fastened 4.0-inch on center into wood blocking or masonry wall.

C3 Membrane

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Revised 01/2002**

- F. The top of the installed metal flashing shall be fastened with the maximum distance between fasteners at 8" or 12" through metal reglet.

3.12 ROOF PENETRATIONS

- A. All penetrations (pipes, supports, soil stacks, curbs, etc.) passing through the roofing membrane shall be flashed in accordance with Republic details.
- B. The flashing seal shall be made directly to the penetration passing through the roof system unless the surface temperature of the penetration exceeds 140°F; surface with temperatures exceed 140°F must have the flashing insulated from the heat source. Contact Republic Technical Department for assistance.
- C. Existing flashing shall be removed before new flashings are installed during retrofit projects.
- D. Use premolded corners to complete flashings of curbs, parapets, pitch pockets and other vertical surfaces.
- E. Use C3 premolded boots to flash circular penetrations 1" to 8" diameter; boots must be pulled over the top of the penetration, do not split the boot.
- F. All others shall be field fabricated using C3 membrane or C3 coated metal.
- G. Pipe Clusters and Unusual Shapes
 - 1. Clusters of pipes and other penetrations which cannot be sealed with C3 membrane or prefabricated flashings shall be sealed by surrounding them with sealant within a pitch pocket.
 - 2. Pitch pockets shall be fabricated from coated metal, installed and flashed into the membrane, filled with non-shrink grout to within ½" of the top of the flashing, and topped with vertical grade sealant, sloped to shed water as shown in the detail drawings. Allow grout to dry before applying sealant.
 - 3. Do not use pitch pockets where premolded flashings or field fabricated flashings using membrane or coated metal are possible.
 - 4. Pitch pockets may require occasional maintenance to check and renew the sealant to ensure continuity of their seal.

H. Roof Drains

- 1. Use only drains with a positive clamping ring. Sleeve type drain inserts are only acceptable with prior approval from the Republic Technical Department.
- 2. Existing flashing and bituminous materials shall be removed from the drain components in preparation for sealant and membrane.
- 3. A smooth, clean finish shall be provide on the mating surfaces between the clamping ring and the drain base.

C3 Membrane

**Republic Powdered Metals,
Inc.
Revised 01/2002**

4. Insulation shall be tapered around the drain to provide positive drainage, prevent the membrane from bridging, and provide a smooth transition from the roof surface to the drain clamping ring.
5. The seal between the membrane and the drain base shall be provided by polysulfide or polyurethane sealant under constant, even compression from the drain clamping ring.

3.13 FASCIA

- A. The fascia shall be fabricated from coated metal, or approved metal fascia system, or other pre-approved systems installed and secured to the treated wood nailers as shown in the Republic details.

3.14 WALKWAYS

- A. C3 Walkways shall be provided where foot traffic will occur more frequently than once a month. If heavier traffic is expected, contact the Republic Technical Department for membrane protection requirements.
- B. Install walkways as per Republic details by fully adhering walk pad using C3 contact adhesive.
- C. Do not use black rubber or other composition-type protection pads.

3.15 WATER CUT-OFFS

- A. Measures shall be taken to ensure that water does not flow beneath the completed sections of the new C3 roofing system. Water cut-offs shall be provided on a daily basis and at the onset of inclement weather. Water cut-offs shall be removed prior to the resumption of work. The integrity of the water cut-off is the sole responsibility of the roofing contractor. Any membrane contaminated by cut-off material shall be removed before installation of the system continues.

3.16 MEMBRANE REPAIR

- A. Correction of damage to the C3 membrane may be accomplished by hot-air and/or solvent welding a membrane section over the affected area.
- B. If the defect is not smooth, cut out and remove enough material to provide an even surface. If any mechanical fasteners are encountered, the repair should include provisions to fasten the repair material.
- C. Repair materials shall overlap the field sheet a minimum of 3" to provide adequate room for a proper weld. Hand welds shall be a minimum of 2"; machine welds shall be a minimum of 1 ½".
- D. Cut all corners of repair materials round.

PART IV-SPECIAL CONDITIONS

4.01 HIGH HUMIDITY OR WET MANUFACTURING PROCESS

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- A. Buildings with high humidity or that contain a wet manufacturing process may require a vapor retarder to control water migration and condensation within the roof system. A design professional should determine whether a vapor retarder is required.

4.02 COOLER OR FREEZER BUILDINGS

- A. Coolers and freezer buildings require special detailing to provide positive seals at perimeters and penetrations to prevent air leakage and condensation within the building envelope.

4.03 POSITIVE PRESSURE OR ACOUSTICAL DECK

- A. A C3 roofing system is not to be used on buildings that have or can develop positive pressure within the building unless measures are taken to prevent the pressure from being transferred to the membrane. This includes mechanical pressurization by HVAC equipment or buildings with large openings on one wall such as hangers or loading docks.
- B. If a positive pressure exists, or there is acoustical decking, provisions must be made to include an air barrier between the deck and insulation. When an air barrier is provided the insulation must be fastened to resist the anticipated loads; contact the insulation manufacturer for fastening requirements.

4.04 SPECIAL WIND RESISTANCE

- A. For buildings that require increased wind uplift resistance due to building height, wind exposure, shape, code requirements or other reasons, contact Republic Technical Department for design and installation requirements.

4.05 ROOFS WITH SLOPES EXCEEDING 3" IN 12"

- A. C3 roofing system cannot be installed using conventional automatic hot-air welding equipment on roofs that exceed 3" in 12" slopes.

4.06 PONDING

- A. Republic Powdered Metals, Inc., agrees with the NRCA position regarding ponded water on roofs. All water should drain from the roof surface within 48 hours following the end of a rain storm.

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C3 Membrane

**Republic Powdered Metals,
Inc.
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