

07230 - PERIMETER INSULATION

PART 1 - GENERAL

- 1.01 SCOPE:
 - A. Provide all of the labor, materials, equipment, and services to furnish and install the perimeter insulation.
- 1.02 QUALITY ASSURANCE:
 - A. Single source responsibility for insulation products. Obtain each type of building insulation from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the work.

- 1.03 SUBMITTALS:
 - A. Prior to installation, submit to the Architect for review the following:
 - 1. Manufacturer's product data indicating density, insulating value, water absorption characteristics and recommended adhesive for the application.
 - 2. Manufacturer's installation instructions.

- 1.04 DELIVERY AND STORAGE:
 - A. Deliver materials in original packages, containers, or bundles bearing manufacturer's labels indicating the brand name and descriptive data confirming compliance with requirements herein specified.

- 1.05 COORDINATING:
 - A. Coordinate shipment and delivery with job progress and other trades for timely installation to preclude delays and interferences and to minimize job storage time. Especially work closely with concrete installers to ensure proper installation.

PART 2 - PRODUCTS

- 2.01 PERIMETER INSULATION:
 - A. Product/Manufacturer:
 - 1. 2" Dow Styrofoam.
 - 2. An approved equal.
 - B. Description:
 - 1. Rigid, extruded polystyrene.
 - 2. Compressive strength: 40 lbs./sq. in., min.
 - 3. Water absorption: 0.1% by volume, max.
 - 4. R-value: 5.0 deg. F./ft. sq./hr./Btu/in. min.

- 2.02 ADHESIVE:
 - A. Type as recommended by the insulation manufacturer for the application involved.

PART 3 - EXECUTION

- 3.01 PREPARATION:
 - A. Verify that substrate and adjacent materials, and insulation boards, are dry and ready to receive insulation and adhesive.
 - B. Verify that substrate is flat and free of irregularities and materials that will impede adhesive bond.
 - C. Verify that insulation boards are unbroken and free of damage, including board skin.

- 3.02 INSTALLATION:
 - A. Recess the insulation enough to allow the slab to remain at its full thickness above the insulation. Install over vapor barrier.

07500 - SINGLE PLY ROOF MEMBRANE

PART 1 - GENERAL

- 1.1 DESCRIPTION:
 - A. Mechanically Fastened Roofing System in conjunction with polyisocyanurate foam insulation board over the structural steel roof deck.

1.2 SCOPE

- A. Provide all labor, material, tools, equipment, and supervision necessary to complete the installation of the .060-mil thick white reinforced TPO (Thermoplastic Polyolefin) membrane. Mechanically-Fastened Roofing System including flashings and insulation as specified herein and as indicated on the drawings in accordance with the manufacturer's most current specifications and details.
- B. The roofing contractor shall be fully knowledgeable of all requirements of the contract documents and shall make themselves aware of all job site conditions that will affect their work.
- C. The roofing contractor shall confirm all given information and advise the building owner, prior to bid, of any conflicts that will affect their cost proposal.
- D. Any contractor who intends to submit a bid using a roofing system other than the approved manufacturer must submit for pre-qualification in writing fourteen (14) days prior to the bid date. Any contractor who fails to submit all information as requested will be subject to rejection. Bids stating "as per plans and specs" will be unacceptable.

1.3 SUBMITTALS

- A. Prior to starting work, the roofing contractor must submit the following:
 - 2. Shop drawings showing layout, details of construction and identification of materials.
 - 3. Sample of the manufacturer's Membrane System Warranty.
 - 4. Submit a letter of certification from the manufacturer which certifies that the contractor is authorized to install the manufacturer's roofing system and lists the training the contractor has received from the manufacturer along with the dates training was received.
 - 5. Certification from the membrane manufacturer indicating the fasteners are capable of providing a static breakout resistance of 10 inch pounds minimum is required.
 - 6. Certification from the membrane manufacturer indicating the membrane thickness over the reinforcing scrim (top ply membrane thickness) is nominal .05-mil or thicker.
 - 7. Certification of the manufacturer's warranty reserve.
- B. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened containers or wrappings with the manufacturer's name, brand name and installation instructions intact and legible. Deliver in a clean and dry condition to permit work to continue without interruption.
- B. Comply with the manufacturer's instructions for proper material storage.
 - 1. Store membranes in original undisturbed plastic wrap in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. Membrane that has been exposed to the elements for approximately 7 days must be prepared with roof membrane cleaner prior to hot air welding.
 - 2. Store curable materials (adhesives and sealants) between 60°F and 80°F in dry areas protected from water and direct sunlight. If exposed to lower temperature, restore to 60°F minimum temperature before using.
 - 3. Store materials containing solvents in dry, well ventilated spaces with proper fire and safety precautions. Keep lids on tight. Use before expiration of their shelf life.

- B. Insulation must be on pallets, off the ground and tightly covered with waterproof materials.

- C. Any materials which are found to be damaged shall be removed and replaced at the applicator's expense.

1.5 WORK SEQUENCE

- A. Schedule and execute work to prevent leaks and excessive traffic on completed roof sections. Care should be exercised to provide protection for the interior of the building and to ensure water does not flow beneath any completed sections of the membrane system.
- B. Do not disrupt activities in occupied spaces.

1.6 USE OF THE PREMISES

- A. Before beginning work, the roofing contractor must secure approval from the building owner's representative for the following:
 - 1. Areas permitted for personnel parking.
 - 2. Access to the site.
 - 3. Areas permitted for storage of materials and debris.
 - 4. Areas permitted for the location of cranes, hoists and chutes for loading and unloading materials to and from the roof.
- B. Interior stairs or elevators may not be used for removing debris or delivering materials, except as authorized by the building superintendent.

1.7 EXISTING CONDITIONS

If discrepancies are discovered between the existing conditions and those noted on the drawings, immediately notify the owner's representative by phone and solicit the manufacturer's approval prior to commencing with the work. Necessary steps shall be taken to make the building watertight until the discrepancies are resolved.

1.8 SAFETY

The roofing contractor shall be responsible for all means and methods as they relate to safety and shall comply with all applicable local, state and federal requirements that are safety related. Safety shall be the responsibility of the roofing contractor. All related personnel shall be instructed daily to be mindful of the full time requirement to maintain a safe environment for the facility's occupants including staff, visitors, customers and the occurrence of the general public on or near the site.

1.9 WORKMANSHIP

- A. Applicators installing new roof, flashing and related work shall be factory trained and approved by the manufacturer they are representing.
- B. All work shall be of highest quality and in strict accordance with the manufacturer's published specifications and to the building owner's satisfaction.
- C. There shall be a supervisor on the job site at all times while work is in progress.

1.10 QUALITY ASSURANCE

- A. The TPO Membrane Roofing System must achieve a UL Class C.
- B. (choose the appropriate paragraph and delete remainder)

The specified roofing assembly must have been successfully tested by a qualified testing agency to resist the design uplift pressures calculated according to

ANSI/SPRI WD-1 "Wind Design Standard Practice for Roofing Assemblies" American Society of Civil Engineers (ASCE 7)

International Building Code (IBC)

- C. The membrane must be manufactured by the material supplier. Manufacturer's duplicate membrane made by others are not acceptable.
- D. Unless otherwise noted in this specification, the roofing contractor must strictly comply with the manufacturer's current specifications and details.
- E. The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings approved by the manufacturer. The roofing applicator shall be thoroughly experienced and can request evidence to provide evidence of having successful experience installing single-ply TPO roofing systems and having installed at least one (1) roofing application or several similar systems of equal or greater size within one year.
- F. Provide adequate number of experienced workers regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job site at all times roofing work is in progress.
- G. There shall be no deviation made from this specification or the approved shop drawings without the prior written approval of the specifier. Any deviation from the manufacturer's installation procedures must be supported by a written justification on the manufacturer's letterhead and presented to the specifier's consideration.
- H. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a registered technical representative of the membrane manufacturer in order to determine whether or not the work will be required before the warranty will be issued. Notify the building owner seventy-two (72) hours prior to the manufacturer's final inspection.

1.11 JOB SITE CONDITIONS AND WARNINGS

- A. Material Safety Data Sheets (MSDS) must be on location at all times during the transportation, storage and application of materials.
- B. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.
- C. When loading materials onto the roof, the Authorized Roofing Applicator must comply with the requirements of the building owner to prevent overloading and possible disturbance to the building structure.
- D. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.
- E. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.
- F. Provide protection, such as 3/4 inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.
- G. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.
- H. New roofing shall be complete and weathertight at the end of the work day.

- 1. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.

1.12 WARRANTY

- F. Provide manufacturer's 20 year Total System Warranty covering both labor and material with no dollar limitation. The maximum wind speed coverage shall be peak gusts of 90 mph measured at 10 meters above ground level. Certification is required with bid submittal indicating the manufacturer has reviewed and agreed to such wind coverage.
- G. Pro-rated System Warranties shall not be accepted.
- H. Evidence of the manufacturer's warranty reserve shall be included as part of the project submittals for the specifier's approval.

PART 2 PRODUCTS

- 2.1 GENERAL:
 - A. All components of the specified roofing system shall be products of Carlisle SynTec or accepted by Carlisle SynTec as compatible.
 - B. All products (including insulation, fasteners, fastening plates, prefabricated accessories and edgings) must be manufactured and/or supplied by the roofing system manufacturer and covered by the warranty.

2.2 MEMBRANE

- A. Furnish Sure-Weld .060-mil thick white reinforced TPO (Thermoplastic Polyolefin) membrane as the drawings, immediately notify the owner's representative by phone and solicit the manufacturer's approval prior to commencing with the work. Necessary steps shall be taken to make the building watertight until the discrepancies are resolved.
- B. Alternates shall be considered and must be approved in writing by Owner prior to purchase and installation.

2.3 INSULATION/UNDERLAYMENT

- A. See Section 07220 Roof Deck Insulation
- B. When applicable, insulation shall be installed in multiple layers. The first and last layer of insulation shall be mechanically fastened to the substrate in accordance with the manufacturer's published specifications.

2.4 FOAM TUBING AND FILLER

- A. Cellular foam sponge tubing 50% larger than joint with safety insulation backup filler.

2.5 ADHESIVES AND CLEANERS

All products shall be furnished by the manufacturer and specifically formulated for the intended purpose.

2.6 FASTENERS AND PLATES

All fasteners and plates shall be as manufactured by the manufacturer and specifically for roof membrane fastening.

2.7 METAL EDGING AND MEMBRANE TERMINATIONS

- A. See Section 07661 Prefabricated Aluminum Coping and Fascia. General: Metal edging shall be tested and meet ANSI/SPRI ES-1 standards and comply with International Building Code.
- C. Termination Bar: Provide and .098" thick extruded aluminum bar pre-punched 6" on center; include a metal ledge to support Lap Sealant and provide increased stability for membrane terminations.

2.8 WALKWAYS

- A. Sure-Weld TPO Walkway Rolls installed per manufacturer's requirements or concrete pavers loose laid over an approved slip sheet (pavers not recommended for slopes greater than 2" in 12").
- B. "Skypath" roof walkway pad as manufactured by Mats, Inc. open grid self-draining, non-porous walkway matting system, 36" wide x 5/8" thickness, furnished in roll format.

2.9 ROOF HATCH AND SAFETY POST

- A. Roof Hatch: Bilco Type 5 or approved equal.
 - a. Furnish and install as located and specified within drawings.
 - b. Provide a 36" long x 30" wide single leaf, pre-assembled, and equipped with interior padlock hasps. Length shall denote the hinge side. Owner shall provide padlock.
- B. Safety Post: Bilco LadderUP or approved equal.
 - a. Provide Model LU-4 aluminum, mill finished.
 - b. Install on fixed ladder below roof hatch.
 - c. Must have a telescoping section that locks automatically when fully extended.

2.10 SMOKE AND HEAT VENTS

- A. Bilco Type S Automatic Smoke and Heat Vents operated manually and by 165 degree fusible link.

2.11 OTHER MATERIALS

- A. All other materials not specifically described but required for proper completion and water tightness of the roof system shall be selected by the contractor, but subject to the approval of the Architect and Owner.

PART 3 EXECUTION

3.1 GENERAL

- A. Comply with the manufacturer's published instructions for the installation of the membrane roofing system including proper substrate preparation, jobsite considerations and weather restrictions.
- B. Position sheets to accommodate contours of the roof deck and shingle splices to avoid bucking water.

3.2 INSULATION PLACEMENT AND ATTACHMENT

- A. Install insulation or membrane underlayment over the substrate with boards butted tightly

together with no joints or gaps greater than 1/4 inch. Stagger joints both horizontally and vertically if multiple layers are provided.

- B. Secure insulation to the substrate with the required Carlisle fasteners and plates in accordance with manufacturer's specifications.

3.3 MEMBRANE PLACEMENT AND ATTACHMENT

- A. Unroll and position membrane. Provide and secure both perimeter and field membrane sheets in accordance with the manufacturer's most current specifications and details.
- B. Secure the membrane with the required fasteners and plates spaced a maximum of 12 inch on center depending on project conditions (centered over the pre-printed marks approximating 1-1/2 inches from the edge of the membrane sheet).
- C. Install adjoining membrane sheets in the same manner in accordance with the manufacturer's specifications.

3.4 MEMBRANE HOT AIR WELDING PROCEDURES

- A. Hot air weld the Sure-Weld membrane using an Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's specifications. All splice intersections, roll the seam with a silicone roller immediately after weld crosses the membrane step-off to ensure a continuous hot air welded seam.

Note: When using .060-mil thick or thicker membrane, splice intersections shall be overlaid with Sure-Weld non-reinforced membrane or TPO T-101 covers.

- B. Probe all seams once the hot air welds have been completed (approximately 30 minutes).
- C. Repair all seam deficiencies the same day they are discovered.
- D. Apply Cut Edge Sealant to all cut edges of reinforced membrane (where the scrim reinforcement is exposed) after seam probing is complete. Cut edge sealant is not required on vertical splices.

3.5 FLASHINGS

- A. Flashing, parapets, curbs, expansion joints and other parts of the roof must be performed using Sure-Weld reinforced membrane. Sure-Weld non-reinforced membrane can be used for flashing and penetrations, Sealant Pockets, scuppers, as well as inside and outside corners when the use of pre-fabricated accessories is not feasible.
- B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.6 WALKWAYS

- A. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the specifier's drawing.
- B. Hot air weld walkway material to the membrane sheet in accordance with the manufacturer's specifications.

3.7 DAILY SEAL

- A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.
- B. Complete an acceptable membrane seal in accordance with the manufacturer's requirements.

3.8 CLEAN UP

- A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.
- B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

07600 - METAL FLASHING

PART 1 - GENERAL

- 1.01 SCOPE:
 - A. Provide all of the labor, materials, equipment, and services to furnish and install the flashing and sheet metal.
 - B. All sheet metal items are not necessarily individually described. The most important parts and those requiring detailed description are usually mentioned. Other work as indicated or necessary shall be provided unless specifically excluded from the work of this Section.

1.02 QUALITY ASSURANCE:

- A. In addition to complying with all pertinent codes and standards, comply with all pertinent recommendations of:
 - 1. "Architectural Sheet Metal Manual", 5th edition. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).
- B. Performance requirements:
 - 1. Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing.
- C. Perform work in accordance with SMACNA requirements:
 - 1. Downspouts:
 - a. Profile: Figure 1-32 (see Drawings for profile and size).
 - b. Hanger design: Figure 1-35 (see Drawings for profile and size).
 - 2. Conductor heads: Figures 1-25C and 1-26.
 - 3. Scupper: Figure 1-26.

- D. Installers:
 - 1. For actual installation of roofing and flashing, use only competent and skilled roofers completely familiar with the products and the manufacturer's currently recommended methods of installation.
 - 2. Work associated with flashing including (but not limited to) membrane roofing and roof deck insulation shall be performed by and be the responsibility of a single installer. Coordinate with Section 07531.

1.03 SUBMITTALS:

- A. Prior to installation, submit to the Architect for review the following:
 - 1. Complete and fully descriptive manufacturer's literature for all factory fabricated items naming all materials, dimensions, finishes and accompanying accessory items.
 - 2. Complete shop drawings and erection drawings for each product named which shall include a material schedule, details, profiles, gauges, dimensions, layout, anchorage and joint details.
 - 3. Physical samples - full range of finishes and coloration.

1.04 PROJECT CONDITIONS:

- A. Coordinate work with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance, durability of work, and protection of materials and finishes.

PART 2 - PRODUCTS

2.01 ALUMINUM SHEET:

- A. Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength/durability of alloy and temper designated below:
 - 1. Factory painted aluminum sheet:
 - a. Counterflashing: 0.0320".
 - b. Other Items: ASTM B209, 3003-H14, with a minimum thickness of 0.040", unless

CONSULTANT:

ROBERT C. NITISHIN, AIA
ARCHITECT

2265 ROSWELL ROAD
SUITE 100
MARIETTA, GEORGIA 30062
770-509-4894 TELEPHONE
770-509-2207 FACSIMILE

CLIENT:

TBC CORPORATION

430 TBC WAY
PALM BEACH GARDENS
FLORIDA 33410

PROJECT INFORMATION:

MFB
TIPS & SERVICE CENTERS

GREER, SOUTH CAROLINA

SEAL:

STATE OF SOUTH CAROLINA
ROBERT C. NITISHIN
MARIETTA, GA
REGISTERED ARCHITECT

PROJECT NO.: 2018011

DRAWN BY: _____

CHECKED BY: _____

ISSUE: _____ DATE: _____

ISSUED FOR PERMIT: 10/10/2018

REVISION: _____ DATE: _____

1 PLAN REVIEW COMMENT 11/2/18

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SPECIFICATIONS

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