PART 1 - GENERAL

1.1 SUMMARY

A. This specifies the following mechanically-attached roofing system.

1. Field-attached system (RhinoBond)
2. Application of new ½” cover board
3. Relief cut old membrane and remove perimeter and in field flashings.
4. Replacement of any wet/damaged insulation
5. Reuse all viable existing insulation (leave in place)
6. Reuse vapor barrier (leave in place)
7. Reuse metal perimeter components if viable.

B. Related Work: Include the following sections.

1. Section 072100 – Thermal Insulation
2. Section 072200 – Roof and Deck Insulation
3. Section 076200 – Sheet Metal Flashing and Trim
4. Section 077100 – Roof Specialties
5. Section 077200 – Roof Accessories

1.2 REFERENCES

A. Current Edition of: Identified reference requirements as put forth by the project specification.

1. State Building Code
2. International Building Code (IBC)
3. American Society of Testing Materials (ASTM)
4. National Roofing Contractors Association (NRCA)
5. Single Ply Roofing Institute (SPRI)
6. Technical Bulletins

1.3 SUBMITTALS

A. Literature: Copies of current relevant information pertaining to the primary components to be used in the roof system including but not limited to:

1. Manufacturer’s Full System Roofing Warranty
2. Applicator’s Warranty
3. Product Data Sheets
4. Material Safety Data Sheets
5. FM/UL listings/approvals
6. Manufacturer assembly certification letter including statement of compliance with minimum thickness requirement in section 2.1 B. Letter from local sales agent will not suffice.
7. Assembly design letter from manufacturer stating compliance with Section 1.4 D (Wind Design). Letter from local sales agent will not suffice.
B. Samples for Verification: Representative samples of primary components to be used in the roof system.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work, including:

1. Base flashings and membrane terminations.
2. Tapered insulation, including slopes.
3. Roof plan showing orientation of roof deck, orientation of roofing membrane, pattern for insulation attachment, and membrane fastening spacing.
4. Fastening patterns for corner, perimeter, and field-of-roof locations.

1.4 QUALITY ASSURANCE

A. Roofing Qualifications:

1. Demonstrated performance history of directly manufacturing (not private labeling) PVC roof membranes no less, in duration of years, than the warranty duration specified.
2. Minimum of five years’ experience recycling membranes at the end of their service life back into new membrane products.
3. No significant revisions to membrane formulation or membrane construction in last 10 years.
4. Membrane must be designed to indicate a successful weld (bleed) that can be viewed as desired by owner or owner’s representative without special equipment or training.
5. All components of roofing system must be covered under full system warranty (including walk pads and all flashing materials.)

B. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Roofing representative, Owner, Architect, Owner's Insurer, Testing and Inspecting Agency representative, Roofing Installer, Deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's most current requirements.
3. Review base flashings, special roofing details and transitions, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
4. Review governing regulations and requirements for insurance and certificates.
5. Review temporary protection requirements for roofing system during and after installation.
6. Deviations from the project specifications or the approved shop drawings are not permitted without prior written approval by the owner, the owner’s representative, and the designer.

C. Fire Design:

1. Underwriters Laboratories, Inc. (Class A Assembly)
D. Wind Design:
   1. System will be designed to withstand wind uplift of 90 psf and wind speeds of 72 mph.

1.5 DELIVERY, HANDLING, AND STORAGE

A. Deliver roofing materials to project site in original containers with seals unbroken and labeled with product manufacturer's name or product brand name.

B. Comply with most current product data sheet requirements when handling, storing, protecting, or installing roofing materials. Including but not limited to avoiding physical damage, deterioration by sunlight, excessive moisture, or other potentially damaging conditions.

C. Store liquid materials in their original undamaged containers in a clean, dry, protected location; away from direct sunlight; within the temperature range noted on the product data sheet.

D. Handle and store roofing materials and equipment in a manner to avoid permanent deflection of deck.

1.6 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's most current requirements and warranty requirements.

B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required and confirmed by roofing manufacturer.

1.7 WARRANTY

A. Roofing Warranty: Full system warranty will be for a term of either (20) years or (20) year full system plus an additional 10 years on roofing membrane (20 + 10) Warranty will include a wind warranty of 72 mph. The warranty must be non-prorated and must not exclude coverage due to ponding water.

B. Applicator’s Warranty: Signed by installing applicator, covering the work of a System Warranty, including all components of roofing system installation such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, vapor retarders, and walkway products, for the following warranty period: 5 years from date of substantial completion.
PART 2 - PRODUCTS

2.1 PERFORMANCE / DESIGN CRITERIA

A. ASTM D4434: Type III
B. NSF/ANSI Standard 347: Platinum
C. Guarantee membrane thickness meets or exceeds specified thickness when tested according to ASTM D751

2.2 ROOFING MATERIALS

A. PVC Sheet:

B. PVC Sheet Thickness:
   1. Sarnafil S327, 60 mil minimum overall, min mils above scrim: 27
   2. Sarnafil S327, 80 mil minimum overall, min mils above scrim: 40 (for 20 + 10 warranty option)

C. PVC Sheet Exposed Face Color:
   1. EnergySmart White, initial solar reflectance of 0.83, emittance of 0.90, and solar reflective index (SRI) of 104.

D. Membrane and Insulation Attachment Method
   1. RhinoBond plate and fastener system

E. Attachment Fasteners:
   1. Threaded HD #14 (for concrete decks)

F. Roof Board:
   1. DensDeck (1/2”)

G. Insulation:
   1. Existing: 20 psi polyiso (reuse all viable material)
   2. Insulfoam EPS (as needed to address roof slope)
   3. Atlas ACFoam IV (as needed to replace wet/damaged existing insulation)

H. Vapor Barrier: existing, reuse

I. Flashing Materials:
   1. Wall/Curb/ Corner Flashing:
      a. Reinforced/ non-reinforced detail membrane
      b. PVC-coated sheet metal (as needed)
   2. Perimeter Edge Flashing:
a. Reuse of existing if in viable condition
b. Replacement with new 24 gauge Kynar coated coping or fascia and min 20 gauge continuous hold down cleat.

3. Misc. Flashing Accessories:
   a. Open Post Flashing
   b. UFlow drain insert (as needed)
   c. Heat welded cover strip
   d. Solvent based adhesives
   e. Prefabricated pipe boots
   f. PMMA flashing material (as needed). Pitch pockets will not be accepted by owner.

J. Miscellaneous Materials:

1. Accessories:
   a. Aluminum Tape
   b. Seam Cleaner
   c. Termination bar
   d. Mastic
   e. Sealant

2. Temporary Overnight Tie-ins (must be removed prior to start of next day’s roofing):
   a. Mechanical attachment with rigid bars and compressed sealant

3. PVC Welding Equipment:
   a. Hand Welder (for details)
   b. RhinoBond Induction Welder Kit

K. Walkway Protection:

1. Sarnafil Crossgrip XTRA or equal

L. Nailers and Blocking:

1. Wood, #2 quality or better, Wolmanized or Osmose treated for fire and rot resistance.
2. Plywood, minimum 1/2 inch CDX (C side out).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Applicator shall verify that the work done under related sections meets the following conditions:

1. All drainage components have been reinstalled properly, or reconditioned, or replaced. If replacement is discovered after work has begun, owner must be notified in writing with MOA and estimated cost within 24 hrs.
2. Roof curbs, nailers, equipment supports, vents and other roof penetrations are properly secured and prepared to receive new roofing materials.
3. All surfaces are smooth and free of dirt, debris and incompatible materials.
4. For concrete deck, verify that concrete substrate is dry and free of moisture. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.
5. All roof surfaces shall be free of water, ice and snow.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Execute relief cuts in existing membrane and remove all flashings around perimeter, curbs, penetrations and drainage components. Examine existing insulation for damage/moisture and note areas to be repaired/replaced.

B. Prevent materials from entering and clogging roof drains and flashings and from spilling or migrating onto surfaces of other construction. Remove roof drain plugs when no work is taking place or when rain is forecast.

3.3 ROOFING INSTALLATION, GENERAL

A. Install roofing system according to product manufacturer's most current requirements including but not limited to roofing applicator handbook, product data sheets, specifications, and or relevant technical bulletins.

B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

C. For tie-in with existing roofing (if applicable), install roofing and auxiliary materials to maintain weather tightness of transitions. Transitions and tie ins to be completed using published standard details provided by manufacturer. Tie ins to existing materials must be done in a manner to prevent chemical incompatibilities from degrading new or existing membrane.

3.4 INSULATION / ROOF BOARD INSTALLATION

A. Coordinate installing roofing system components so insulation (new or existing) is not exposed to precipitation or other sources of moisture.

B. Comply with product manufacturer's most current requirements for installing roof insulation.

C. Install tapered insulation to conform to slopes indicated (where needed).

D. Trim insulation where necessary at roof drains so completed surface is smooth and does not restrict flow of water.

E. Drains shall be properly sumped to allow membrane to sit flat without stretching or wrinkling.
F. Fill gaps exceeding 1/4 inch with insulation. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

G. Install cover board (DensDeck) and secure by fastening top layer to deck using mechanical fasteners specifically designed and sized for fastening specified board-type to deck type at the spacing rate according to roofing manufacturer and Owner’s Representative/Designer.

3.5 MEMBRANE INSTALLATION

A. Mechanically Fastened System:
   1. Field-attached system (RhinoBond): Secure PVC roofing membrane using RhinoBond Induction Welder to Sarnadisc-RhinoBond plates fastened with applicable Sarnafasteners and hot-air weld lapping seams with single nozzle welder.

B. Install PVC roofing membrane and secure by fastening using mechanical fasteners specifically designed and sized for fastening specified system to specific deck type at the spacing rate according to roofing manufacturer and Owner’s Representative/Designer. Continue mechanically fastening roofing membrane over area to receive roofing in accordance with roofing system manufacturer's most current requirements.

C. Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

D. Apply roofing with side laps shingled with slope of roof deck where possible.

E. Make sure seam areas are free of debris, dirt, and dust, overlap membrane sheets, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's most current requirements to ensure a watertight seam installation. Rhinobond magnets should be cleaned of debris continuously throughout application of induction welding process.
   1. Verify in-field weld strength of seams a minimum of twice daily, repair seam sample areas.
   2. Test lap edges with probe to verify seam weld continuity.
   3. If any tears or voids in lapped seams are found repair using appropriate approved technique.

F. Spread continuous sealant bead leaving no gaps over deck drain flange at roof drains, and securely seal roofing in place with clamping ring.

3.6 BASE / FIELD FLASHING INSTALLATION

A. Install all membrane and preformed flashings according to roofing system manufacturer's most current requirements.

B. Install membrane base flashing by applying bonding adhesive to substrate and underside of membrane flashing at required rate. Do not apply to seam area of flashing.

C. Flash field penetrations and inside/outside corners with appropriate prefab flashing components or by approved custom in-field fabrication technique.
D. Firmly roll membrane flashing into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.

E. Terminate and seal top of membrane flashings and mechanically anchor to substrate

3.7 WALKWAY INSTALLATION

A. Crossgrip XTRA: Install walkway product in locations indicated, loose-lay on deck sheet, and connect butt ends together.

3.8 FIELD QUALITY CONTROL

A. Arrange for roofing system manufacturer's technical personnel to inspect roofing installation upon completion.

B. Repair or remove and replace components of roofing system that do not comply with specified requirements.

C. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.9 PROTECTION

A. Protect new roofing system from damage and wear during construction period. Inspect new roofing for damage if used during construction

END OF SECTION