



- 3.3.35. IF MORE THAN ONE LAYER OF INSULATION IS USED, ALL JOINTS BETWEEN SUBSEQUENT LAYERS SHALL BE OFFSET BY AT LEAST 6 INCHES.
- 3.3.36. MECHANICAL ATTACHMENT: USE ONLY FASTENERS, STRESS PLATES AND FASTENING PATTERNS ACCEPTED FOR USE BY THE ROOF MANUFACTURER. FASTENING PATTERNS MUST MEET APPLICABLE DESIGN REQUIREMENTS.
- 3.3.36.1. INSTALL FASTENERS IN ACCORDANCE WITH THE ROOF MANUFACTURER'S REQUIREMENTS. FASTENERS THAT ARE IMPROPERLY INSTALLED MUST BE REPLACED OR CORRECTED.
- 3.3.37. INSTALL MECHANICAL FASTENERS THROUGH TOP LAYER TO ATTACH DURO-GUARD® ISO II (FLAT) INSULATION. INSTALL ALL LAYERS IN PARALLEL COURSES WITH END JOINTS STAGGERED 50% AND ADJACENT BOARDS BUTTED TOGETHER WITH NO GAPS GREATER THAN 1/4 INCH.
- 3.3.4. ROOF MEMBRANE: 50 MIL, DURO-LAST® PVC THERMOPLASTIC MEMBRANE
- 3.3.4.1. USE ONLY FASTENERS, STRESS PLATES AND FASTENING PATTERNS ACCEPTED FOR USE BY THE ROOF MANUFACTURER. FASTENING PATTERNS MUST MEET THE APPLICABLE DESIGN REQUIREMENTS.
- 3.3.4.2. INSTALL FASTENERS IN ACCORDANCE WITH THE ROOF MANUFACTURER'S REQUIREMENTS. FASTENERS THAT ARE IMPROPERLY INSTALLED MUST BE REPLACED OR CORRECTED.
- 3.3.4.3. MECHANICALLY FASTEN ROOF MEMBRANE TO THE STRUCTURAL DECK UTILIZING FASTENERS AND STRESS PLATES THAT MEET THE REQUIREMENTS OF THE ROOF MANUFACTURER'S REQUIREMENTS.
- 3.3.4.4. CUT MEMBRANE TO FIT FLASHINGS AROUND ALL PENETRATIONS AND RISERS. FLASHINGS TO BE PLACED ON INSULATION AND POSITIONED WITH A MINIMUM 6 INCH OVERLAP.
- 3.3.5. FLASHING
- 3.3.5.1. OVERLAPPING SHEETS TOGETHER USING HOT AIR. MINIMUM OVERLAP IS 1-1/2 INCHES.
- 3.3.5.2. CHECK FIELD WELDED SEAMS FOR CONTINUITY AND INTEGRITY AND REPAIR ALL IMPERFECTIONS BY THE END OF EACH WORK DAY.
- 3.3.5.3. MEMBRANE TERMINATION/SECUREMENT: ALL MEMBRANE TERMINATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
- 3.3.6.1. PROVIDE SECUREMENT AT ALL MEMBRANE TERMINATIONS AT THE PERIMETER OF EACH ROOF LEVEL, ROOF SECTION, CURB FLASHING, SKYLIGHT, EXPANSION JOINT, INTERIOR WALL, PENTHOUSE, AND OTHER SIMILAR CONDITION.
- 3.3.6.2. PROVIDE SECUREMENT AT ANY ANGLE CHANGE WHERE THE SLOPE OR COMBINED SLOPES EXCEEDS TWO INCHES IN ONE HORIZONTAL FOOT.
- 3.3.7. FLASHINGS: COMPLETE ALL FLASHINGS AND TERMINATIONS AS INDICATED ON THE DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
- 3.3.7.1. PROVIDE SECUREMENT AT ALL MEMBRANE TERMINATIONS AT THE PERIMETER OF EACH ROOF LEVEL, ROOF SECTION, CURB FLASHING, SKYLIGHT, EXPANSION JOINT, INTERIOR WALL, PENTHOUSE, AND OTHER SIMILAR CONDITION.
- 3.3.7.1.1. DO NOT APPLY FLASHING OVER EXISTING THRU-WALL FLASHINGS OR WEEP HOLES.
- 3.3.7.1.2. SECURE FLASHING ON A VERTICAL SURFACE BEFORE THE SEAM BETWEEN THE FLASHING AND THE MAIN ROOF SHEET IS COMPLETED.
- 3.3.7.1.3. EXTEND FLASHING MEMBRANE A MINIMUM OF 6 INCHES (152 MM) OUT TO THE MAIN ROOF SHEET BEYOND THE MECHANICAL SECUREMENT.
- 3.3.7.1.4. USE CARE TO ENSURE THAT THE FLASHING DOES NOT BRIDGE LOCATIONS WHERE THERE IS A CHANGE IN DIRECTION (E.G. WHERE THE PARAPET MEETS THE ROOF DECK).
- 3.3.7.2. PENETRATIONS
- 3.3.7.2.1. FLASH ALL PIPES, SUPPORTS, SOIL STACKS, COLD VENTS, AND OTHER PENETRATIONS PASSING THROUGH THE ROOFING MEMBRANE AS INDICATED ON THE DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
- 3.3.7.2.2. UTILIZE CUSTOM PREFABRICATED FLASHINGS SUPPLIED BY THE MANUFACTURER.
- 3.3.7.2.3. EXISTING FLASHINGS: REMOVE WHEN NECESSARY TO ALLOW NEW FLASHING TO TERMINATE DIRECTLY TO THE PENETRATION.
- 3.3.7.3. PIPE CLUSTERS AND UNUSUAL SHAPES
- 3.3.7.3.1. CLUSTERS OF PIPES OR OTHER PENETRATIONS WHICH CANNOT BE SEALED WITH PREFABRICATED MEMBRANE FLASHINGS SHALL BE SEALED BY SURROUNDING THEM WITH A PREFABRICATED VINYL-COATED METAL PITCH PAN AND SEALANT SUPPLIED BY THE MANUFACTURER.
- 3.3.7.3.2. VINYL-COATED METAL PITCH PANS SHALL BE INSTALLED, FLASHED AND FILLED WITH SEALANT IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
- 3.3.7.3.3. PITCH PANS SHALL NOT BE USED WHERE PREFABRICATED OR FIELD FABRICATED FLASHINGS ARE POSSIBLE.
- 3.3.8. ROOF DRAINS
- 3.3.8.1. COORDINATE INSTALLATION OF ROOF DRAINS AND VENTS SPECIFIED IN SECTION 15.16 - PLUMBING SPECIALTIES.
- 3.3.8.2. REMOVE EXISTING FLASHING AND ASPHALT AT EXISTING DRAINS IN PREPARATION FOR SEALANT AND MEMBRANE.
- 3.3.8.3. PROVIDE A SMOOTH CLEAN SURFACE ON THE MATING SURFACE BETWEEN THE CLAMPING RING AND THE DRAIN BASE.
- 3.3.9. EDGE DETAILS
- 3.3.9.1. PROVIDE EDGE DETAILS AS INDICATED ON THE DRAWINGS. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
- 3.3.9.2. JOIN INDIVIDUAL SECTIONS IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
- 3.3.9.3. COORDINATE INSTALLATION OF METAL FLASHING AND COUNTER FLASHING SPECIFIED IN SECTION 07620.
- 3.3.9.4. MANUFACTURED ROOF SPECIALTIES: COORDINATE INSTALLATION OF COPINGS, COUNTER FLASHING SYSTEMS, GUTTERS, DOWNSPOUTS, AND ROOF EXPANSION ASSEMBLIES SPECIFIED IN SECTION 07710.
- 3.3.10. WALKWAYS
- 3.3.10.1. INSTALL WALKWAYS IN ACCORDANCE WITH THE MEMBRANE MANUFACTURER'S REQUIREMENTS.
- 3.3.10.2. PROVIDE WALKWAYS WHERE INDICATED ON THE DRAWINGS.
- 3.3.10.3. INSTALL WALKWAY PADS AT ROOF HATCHES, ACCESS DOORS, ROOFTOP LADDERS AND ALL OTHER TRAFFIC CONCENTRATION POINTS REGARDLESS OF TRAFFIC FREQUENCY. PROVIDED IN AREAS RECEIVING REGULAR TRAFFIC TO SERVICE ROOFTOP UNITS OR WHERE A PASSAGeway OVER THE SURFACE IS REQUIRED. DO NOT INSTALL WALKWAYS OVER FLASHINGS OR FIELD SEAMS UNTIL MANUFACTURER'S WARRANTY INSPECTION HAS BEEN COMPLETED.
- 3.3.11. WATER CUT-OFFS
- 3.3.11.1. PROVIDE WATER CUT-OFFS ON A DAILY BASIS AT THE COMPLETION OF WORK AND AT THE ONSET OF INCLEMENT WEATHER.
- 3.3.11.2. PROVIDE WATER CUT-OFFS TO ENSURE THAT WATER DOES NOT FLOW BENEATH THE COMPLETED SECTIONS OF THE NEW ROOFING SYSTEM.
- 3.3.11.3. REMOVE WATER CUT-OFFS PRIOR TO THE RESUMPTION OF WORK.
- 3.3.11.4. THE INTEGRITY OF THE WATER CUT-OFF IS THE SOLE RESPONSIBILITY OF THE ROOFING CONTRACTOR.
- 3.3.11.5. ANY MEMBRANE CONTAMINATED BY THE CUT-OFF MATERIAL SHALL BE CLEANED OR REMOVED.
- 3.4. FIELD QUALITY CONTROL
- 3.4.1. THE MANUFACTURER'S REPRESENTATIVE SHALL PROVIDE A COMPREHENSIVE FINAL INSPECTION AFTER COMPLETION OF THE ROOF SYSTEM. ALL APPLICATION ERRORS SHALL BE ADDRESSED AND FINAL PUNCH LIST COMPLETED.
- 3.5. PROTECT INSTALLED ROOFING PRODUCTS FROM CONSTRUCTION OPERATIONS THROUGHOUT THE PROJECT.
- 3.5.2. WHERE TRAFFIC IS ANTICIPATED OVER COMPLETED ROOFING MEMBRANE, PROTECT FROM DAMAGE USING DURABLE MATERIALS THAT ARE COMPATIBLE WITH MEMBRANE.
- 3.5.3. REPAIR OR REPLACE DAMAGED PRODUCTS AFTER WORK IS COMPLETED.
- END OF SECTION

SPECIFICATIONS:

DIVISION 7: THERMAL AND MOISTURE PROTECTION

SECTION 7A: BUILDING INSULATION

GENERAL PROVISIONS

1. SCOPE: FURNISH AND INSTALL FIBERGLASS INSULATION AND ROOF INSULATION TO PROVIDE A COMPLETELY INSULATED THERMAL SHELL WITH NO BREAKS OR PENETRATIONS.

2. NOTES: INSULATION VALUES SHALL COMPLY WITH STATE AND LOCAL CODE REQUIREMENTS AND/OR VALUES SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN. WHICHEVER REQUIREMENT PROVIDES THE GREATER "R" VALUE.

3. QUALITY CONTROL: THE OWNER SHALL BE NOTIFIED WHEN THE INSULATION IS IN PLACE, PRIOR TO THE INSTALLATION OF FINISH MATERIALS.

MATERIALS

1. FIBERGLASS INSULATION CONCEALED IN WALLS BY OWENS-CORNING OR JOHNS-MANVILLE. 5 1/2" R-19 FIBERGLASS ROLL INSULATION WITH KRAFT TYPE VAPOR BARRIER ON INSIDE FACE.

2. FIBER GLASS INSULATION EXPOSED ABOVE CEILING BY OWENS-CORNING OR JOHNS-MANVILLE. 5 1/2" R-19 FIBERGLASS ROLL INSULATION WITH INTEGRAL FOIL REINFORCED KRAFT FACING ON INSIDE FACE WITH FLAME HAZARD RATING OF 25/50 OR LESS.

3. ROOF INSULATION BOARD: CLOSED CELL POLYISOCYANURATE FOAM CORE WITH FACTORY LAMINATED FOIL FACING. FOAM CORES WITH FLAME SPREAD OF 25 OR LESS AND COMPRESSIVE STRENGTH OF 20 PSI OR GREATER (ASTM D-1621) WITH A MINIMUM AGED R VALUE OF PER REGION BY ONE (1) OF THE FOLLOWING APPROVED MANUFACTURERS:

- A. AC FOAM SUPREME BY ATLAS INDUSTRIES
- B. THERMA ROOF PLUS BY R-MAX
- C. TEM-PRO SP BY THE TEMPLE ESTEX

THE LISTED INSULATIONS ARE AVAILABLE THROUGH QUALIFIED ROOFING INSTALLERS. SEE NATIONAL ACCOUNTS INDEX.

4. PERIMETER FOUNDATION INSULATION: SHALL BE STYROFOAM SM BY DOW CHEMICAL CO. OR APPROVED EQUAL 2" THICK. THERMAL CONDUCTIVITY SHALL BE .20 BTU/HR/SQ. FT./INCH THICKNESS AT 75 DEG F MEAN TEMPERATURE. R-10 VALUE.

5. CONCRETE BLOCK CELL INSULATION FOR MASONRY WALLS SHALL BE SILICONE-TREATED PERLITE LOOSE-FILL INSULATION BY A MEMBER OF THE PERLITE INSTITUTE.

PERFORMANCE

1. INSTALLATION:

- A. FIBERGLASS INSULATION: STAPLE AND/OR TAPE IN PLACE WITH VAPOR BARRIER SIDE INWARD. ALL JOINTS SHALL BE LAPPED TO PREVENT MOISTURE VAPOR MIGRATION. ALL PENETRATIONS AND PLUMBING AND ELECTRICAL BOXES SHALL BE INSULATED ON THE OUTWARD SIDE. ANY JOINTS NOT OVER WOOD FRAMING OR BLOCKING SHALL BE TAPED THOROUGHLY. STUFF AROUND DOOR FRAMES AND CLOSELY SPACED FRAMING MEMBERS.

- B. ROOF INSULATION: USE MECHANICAL FASTENERS WITH STEEL OR WOOD DECK. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS OF SIX (6) PER BOARD MINIMUM. STAGGER PANEL END JOINTS AT ADJACENT PANEL MID POINT.

- C. PERIMETER FOUNDATION INSULATION: INSTALL FROM TOP OF DOWNWARD 24" WHEN FOUNDATION DEPTH PERMITS. OTHERWISE, INSULATION SHALL EXTEND FROM TOP TO BOTTOM OF SLAB AND HORIZONTALLY UNDER SLAB 24" TOWARD INTERIOR OF BUILDING.

- D. MASONRY CAVITY WALL INSULATION: INSTALL IN CAVITY WHEN SHOWN BETWEEN MASONRY WALL REINFORCING AS WALL IS BEING LAID.

- E. CONCRETE BLOCK CELL INSULATION: INSTALL WHEN SHOWN IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

SECTION 7B: POLYVINYL-CHLORIDE ROOFING

PART 1: GENERAL

1.1 SECTION INCLUDES

- 1.1.1. DURO-LAST® PVC THERMOPLASTIC MEMBRANE ATTACHED WITH MECHANICAL FASTENERS
- 1.1.2. DURO-GUARD® ISO II (FLAT), ATTACHED WITH MECHANICAL FASTENERS
- 1.1.3. ATLAS FR-10 FIRE RATED SLIP SHEET, ATTACHED WITH MECHANICAL FASTENERS
- 1.1.4. PREFABRICATED FLASHINGS, CORNERS, PARAPETS, STACKS, VENTS, AND RELATED DETAILS
- 1.1.5. FASTENERS, ADHESIVES, AND OTHER ACCESSORIES REQUIRED FOR A COMPLETE ROOFING INSTALLATION
- 1.1.6. TRAFFIC PROTECTION

1.2 REFERENCES

- 1.2.1. NRCA - THE NRCA ROOFING AND WATERPROOFING MANUAL
- 1.2.2. ASCE 7 - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
- 1.2.3. UL - ROOFING MATERIALS AND SYSTEMS DIRECTORY, ROOFING SYSTEMS (TRFJR R10128)
- 1.2.4. ASTM C 1289 - STANDARD SPECIFICATION FOR FACED RIGID CELLULAR POLYISOCYANURATE THERMAL INSULATION BOARD
- 1.2.5. ASTM D 751 - STANDARD TEST METHODS FOR COATED FABRICS
- 1.2.6. ASTM D 4434 - STANDARD SPECIFICATION FOR POLY(VINYL CHLORIDE) SHEET ROOFING
- 1.2.7. ASTM E 108 - STANDARD TEST METHODS FOR FIRE TESTS OF ROOF COVERINGS
- 1.2.8. ASTM E 119 - STANDARD TEST METHODS FOR FIRE TESTS OF BUILDING CONSTRUCTION AND MATERIALS.

1.3 SYSTEM DESCRIPTION

1.3.1. GENERAL: PROVIDE INSTALLED ROOFING MEMBRANE AND BASE FLASHINGS THAT REMAIN WATER-TIGHT; DO NOT PERMIT THE PASSAGE OF WATER, AND RESIST SPECIFIED UPLIFT PRESSURES, THERMALLY INDUCED MOVEMENT, AND EXPOSURE TO WEATHER WITHOUT FAILURE.

1.3.2. MATERIAL COMPATIBILITY: PROVIDE ROOFING MATERIALS THAT ARE COMPATIBLE WITH ONE ANOTHER UNDER CONDITIONS OF SERVICE AND APPLICATION REQUIRED. AS DEMONSTRATED BY ROOFING MEMBRANE MANUFACTURER BASED ON TESTING AND FIELD EXPERIENCE.

1.3.3. PHYSICAL PROPERTIES

- 1.3.3.1. ROOF PRODUCT MUST MEET THE REQUIREMENTS OF TYPE III PVC SHEET ROOFING AS DEFINED BY ASTM D 4434 AND MUST MEET OR EXCEED THE FOLLOWING PHYSICAL PROPERTIES: THICKNESS: 50 MIL, NOMINAL, IN ACCORDANCE WITH ASTM 751.
- 1.3.3.2. THICKNESS OVER SCRIM: ≥ 28 MIL IN ACCORDANCE WITH ASTM D 751.
- 1.3.3.3. BREAKING STRENGTHS: ≥ 390 LBF. (MD) AND ≥ 38 LBF. (XMD) IN ACCORDANCE WITH ASTM D 751, GRAB METHOD.
- 1.3.3.4. ELONGATION AT BREAK: ≥ 31% (MD) AND ≥ 31% (XMD) IN ACCORDANCE WITH ASTM D 751, GRAB METHOD.
- 1.3.3.5. HEAT AGING IN ACCORDANCE WITH ASTM D 3045, TEST FOR 56 DAYS. NO SIGN OF CRACKING, FLIPPING OR CRAZING. (IN ACCORDANCE WITH ASTM D 2136)
- 1.3.3.6. FACTORY SEAM STRENGTH: ≥ 400 LBF. IN ACCORDANCE WITH ASTM D 751 GRAB METHOD.
- 1.3.3.7. TEARING STRENGTH: ≥ 132 LBF. (MD) AND ≥ 163 LBF. (XMD) IN ACCORDANCE WITH ASTM D 751, GRAB METHOD.
- 1.3.3.8. LOW TEMPERATURE CRACK EXHIBITION: PASS AT -40 °F IN ACCORDANCE WITH ASTM D 2136.
- 1.3.3.9. ACCELERATED WEATHERING: NO CRACKING, CHECKING, CRAZING, EROSION OR CHALKING AFTER 5,000 HOURS IN ACCORDANCE WITH ASTM G 154.
- 1.3.3.10. LINEAR DIMENSIONAL CHANGE: < 0.5% IN ACCORDANCE WITH ASTM D 1204 AT 176 ± 2 °F FOR 6 HOURS.
- 1.3.3.11. WATER ABSORPTION: < 1.7% IN ACCORDANCE WITH ASTM D 570 AT 158 °F FOR 168 HOURS.
- 1.3.3.12. STATIC PUNCTURE RESISTANCE: ≥ 56 LBS. IN ACCORDANCE WITH ASTM D 5602.
- 1.3.3.13. DYNAMIC PUNCTURE RESISTANCE: ≥ 14.7 FT.-LBF. IN ACCORDANCE WITH ASTM D 5635.

1.3.4. COOL ROOF RATING COUNCIL (CRRC)

- 1.3.4.1. MEMBRANE MUST BE LISTED ON CRRC WEBSITE.
- 1.3.4.1.1. INITIAL SOLAR REFLECTANCE: ≥ 89%
- 1.3.4.1.2. INITIAL THERMAL EMITTANCE: ≥ 87%
- 1.3.4.1.3. INITIAL SOLAR REFLECTIVE INDEX (SRI): ≥ 111
- 1.3.4.1.4. 3-YEAR AGED SOLAR REFLECTANCE: ≥ 68%
- 1.3.4.1.5. 3-YEAR AGED THERMAL EMITTANCE: ≥ 84%
- 1.3.4.1.6. 3-YEAR AGED SOLAR REFLECTIVE INDEX (SRI): ≥ 82

1.3.5. INSULATION

1.3.5.1. PROVIDE OVERALL THERMAL RESISTANCE FOR ROOFING SYSTEM AS FOLLOWS:

- 1.3.5.1.1. MINIMUM R-VALUE: 30.
- 1.3.5.2. INSTALL USING A MINIMUM OF TWO LAYERS.
- 1.3.5.3. CONFIGURATION AS INDICATED ON THE DRAWINGS.

1.4. SUBMITTALS

- 1.4.1. SUBMIT UNDER PROVISIONS OF SECTION 01300.
- 1.4.2. DURO-LAST DATA SHEETS ON EACH PRODUCT TO BE USED, INCLUDING:
 - 1.4.2.1. PREPARATION INSTRUCTIONS AND RECOMMENDATIONS.
 - 1.4.2.2. STORAGE AND HANDLING REQUIREMENTS AND RECOMMENDATIONS.
 - 1.4.2.3. INSTALLATION METHODS.
 - 1.4.2.4. MAINTENANCE REQUIREMENTS.
- 1.4.3. SHOP DRAWINGS: INDICATE INSULATION PATTERN, OVERALL MEMBRANE LAYOUT, FIELD SEAM LOCATIONS, JOINT OR TERMINATION DETAIL CONDITIONS, AND LOCATION OF FASTENERS. VERIFICATION SAMPLES: FOR EACH PRODUCT SPECIFIED, TWO SAMPLES, REPRESENTING ACTUAL PRODUCT, COLOR, AND FINISH.
- 1.4.3.1. 4 INCH BY 6 INCH SAMPLE OF ROOFING MEMBRANE, OF COLOR SPECIFIED.
- 1.4.3.2. 4 INCH BY 6 INCH SAMPLE OF WALKWAY PAD.
- 1.4.3.3. TERMINATION BAR, FASCIA BAR WITH COVER, DRIP EDGE AND GRAVEL STOP IF TO BE USED.
- 1.4.3.4. EACH FASTENER TYPE TO BE USED FOR INSTALLING MEMBRANE, INSULATION/RECOVER BOARD, TERMINATION BAR AND EDGE DETAILS.
- 1.4.4. INSTALLER CERTIFICATION: CERTIFICATION FROM THE ROOFING SYSTEM MANUFACTURER THAT INSTALLER IS APPROVED, AUTHORIZED, OR LICENSED BY MANUFACTURER TO INSTALL ROOFING SYSTEM.
- 1.4.5. MANUFACTURER'S WARRANTIES.

1.5. QUALITY ASSURANCE

- 1.5.1. PERFORM WORK IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 1.5.2. MANUFACTURER QUALIFICATIONS: MANUFACTURER SPECIALIZING IN THE PRODUCTION OF PVC MEMBRANES SYSTEMS AND UTILIZING A QUALITY CONTROL MANUAL DURING THE PRODUCTION OF THE MEMBRANE ROOFING SYSTEM THAT HAS BEEN APPROVED BY AND IS INSPECTED BY UNDERWRITER'S LABORATORIES.
- 1.5.3. INSTALLER QUALIFICATIONS: COMPANY SPECIALIZING IN INSTALLATION OF ROOFING SYSTEMS SHALL HAVE THOSE SPECIFIED IN THIS PROJECT AND APPROVED BY THE ROOFING SYSTEM MANUFACTURER.
- 1.5.4. SOURCE LIMITATIONS: OBTAIN COMPONENTS FOR MEMBRANE ROOFING SYSTEM FROM ROOFING MEMBRANE MANUFACTURER.
- 1.5.5. THE INSTALLER SHALL INSURE THE ROOF MEMBRANE MANUFACTURER'S SPECIFICATIONS OR THE APPROVED SHOP DRAWINGS, THROUGHOUT THE PRIOR WRITTEN APPROVAL OF THE MANUFACTURER.

1.6. REGULATORY REQUIREMENTS

- 1.6.1. CONFORM TO APPLICABLE CODE FOR ROOF ASSEMBLY WIND UPLIFT AND FIRE HAZARD REQUIREMENTS.
- 1.6.2. FIRE EXPOSURE: PROVIDE MEMBRANE ROOFING MATERIALS WITH THE FOLLOWING FIRE-TEST RESPONSE CHARACTERISTICS: MATERIALS SHALL BE IDENTIFIED WITH APPROPRIATE MARKINGS OF APPLICABLE TESTING AND INSPECTING AGENCY.
- 1.6.2.1. EXTERIOR FIRE-TEST EXPOSURE:
 - 1.6.2.1.1. CLASS A: ASTM E 108, FOR APPLICATION AND ROOF SLOPES INDICATED.
 - 1.6.2.2. FIRE-RESISTANCE RATINGS: COMPLY WITH ASTM E 119 FOR FIRE-RESISTANCE-RATED ROOF ASSEMBLIES OF WHICH ROOFING SYSTEM IS A PART.
 - 1.6.2.3. CONFORM TO APPLICABLE CODE FOR ROOF ASSEMBLY FIRE HAZARD REQUIREMENTS.

1.6.3. WIND UPLIFT

- 1.6.3.1. ROOFING SYSTEM DESIGN: PROVIDE A ROOFING SYSTEM DESIGNED TO RESIST UPLIFT PRESSURES CALCULATED ACCORDING TO THE CURRENT EDITION OF THE ASCE-7 SPECIFICATION MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

1.7. PRE-INSTALLATION MEETING

- 1.7.1. CONVENE MEETING NOT LESS THAN ONE WEEK BEFORE STARTING WORK OF THIS SECTION.
- 1.7.2. REVIEW METHODS AND PROCEDURES RELATED TO ROOF DECK CONSTRUCTION AND ROOFING SYSTEM INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:
 - 1.7.2.1. MEET WITH OWNER, ARCHITECT, OWNER'S INSURER IF APPLICABLE, TESTING AND INSPECTING AGENCY REPRESENTATIVE, ROOFING INSTALLER, ROOFING SYSTEM MANUFACTURER'S REPRESENTATIVE, DECK INSTALLER, AND INSTALLERS WHOSE WORK INTERFACES WITH OR AFFECTS THIS SECTION.
 - 1.7.2.2. REVIEW AND FINALIZE CONSTRUCTION SCHEDULE AND VERIFY AVAILABILITY OF MATERIALS, INSTALLER'S PERSONNEL, EQUIPMENT, AND FACILITIES NEEDED TO MAKE PROGRESS AND AVOID DELAYS.
 - 1.7.2.3. EXAMINE DECK SUBSTRATE CONDITIONS AND FINISHES FOR COMPLIANCE WITH REQUIREMENTS, INCLUDING FLATNESS AND FASTENING.
 - 1.7.2.4. REVIEW STRUCTURAL LOADING LIMITATIONS OF ROOF DECK DURING AND AFTER ROOFING.

1.7.2.5. REVIEW

- 1.7.2.5. REVIEW BASE FLASHINGS, SPECIAL ROOFING DETAILS, ROOF DRAINAGE, ROOF PENETRATIONS, EQUIPMENT CURBS, AND CONDITION OF OTHER CONSTRUCTION THAT WILL AFFECT ROOFING SYSTEM.
- 1.1.1.6. REVIEW GOVERNING REGULATIONS AND REQUIREMENTS FOR INSURANCE AND CERTIFICATES IF APPLICABLE.
- 1.1.1.7. REVIEW TEMPORARY PROTECTION REQUIREMENTS FOR ROOFING SYSTEM DURING AND AFTER INSTALLATION.
- 1.1.1.8. REVIEW ROOF OBSERVATION AND REPAIR PROCEDURES AFTER ROOFING INSTALLATION.

1.8. DELIVERY, STORAGE AND HANDLING

- 1.8.1. DELIVER ROOFING MATERIAL TO PROJECT SITE IN ORIGINAL CONTAINERS WITH SEALS UNBROKEN AND LABELS WITH MANUFACTURER'S NAME, PRODUCT BRAND NAME AND TYPE, DATE OF MANUFACTURE, AND DIRECTION OF STORING AND MIXING WITH OTHER COMPONENTS.
- 1.8.2. STORE ALL MATERIALS IN THEIR ORIGINAL UNDAMAGED CONTAINERS. KEEP DRY, PROTECTED LOCATION AND WITHIN TEMPERATURE RANGE REQUIRED BY ROOFING SYSTEM MANUFACTURER. DO NOT STORE LIQUID MATERIAL FROM DIRECT CONTACT WITH SUNLIGHT.
- 1.8.3. PROTECT ALL INSULATION MATERIALS FROM PHYSICAL DAMAGE AND FROM DEGRADATION BY SUNLIGHT, MOISTURE, SOLING, AND OTHER SOURCES. STORE IN A DRY LOCATION, COMPLY WITH INSULATION MANUFACTURER'S WRITTEN INSTRUCTIONS FOR HANDLING, STORING, AND PROTECTING DURING INSTALLATION.
- 1.8.4. STORE ROOF MATERIALS AND PLACE EQUIPMENT IN A MANNER TO AVOID PERMANENT DEFLECTION OF DECK.
- 1.8.5. STORE AND DISPOSE OF SOLVENT-BASED MATERIALS, AND MATERIALS USED WITH SOLVENT-BASED MATERIALS, IN ACCORDANCE WITH REQUIREMENTS OF LOCAL AUTHORITIES HAVING JURISDICTION.

1.9. WARRANTY

- 1.9.1. CONTRACTOR'S WARRANTY: THE CONTRACTOR SHALL WARRANT THE ROOF APPLICATION WITH RESPECT TO WORKMANSHIP AND PROPER APPLICATION FOR TWO (2) YEARS FROM THE EFFECTIVE DATE OF THE WARRANTY ISSUED BY THE MANUFACTURER.
- 1.9.2. MANUFACTURER'S WARRANTY: MUST BE NO-DOLLAR LIMIT TYPE AND PROVIDE FOR COMPLETION OF REPAIRS, REPLACEMENT OF MEMBRANE OR TOTAL REPLACEMENT OF THE ROOFING SYSTEM AT THE THEN-CURRENT MATERIAL AND LABOR PRICES THROUGHOUT THE LIFE OF THE WARRANTY. IN ADDITION THE WARRANTY MUST MEET THE FOLLOWING CRITERIA:
 - 1.9.2.1. WARRANTY PERIOD: 15 YEARS FROM DATE ISSUED BY THE MANUFACTURER.
 - 1.9.2.2. NO EXCLUSIONS FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.
 - 1.9.2.3. NO EXCLUSION FOR DAMAGE CAUSED BY PONDING WATER.
 - 1.9.2.4. NO EXCLUSION FOR DAMAGE CAUSED BY BIOLOGICAL GROWTH.
 - 1.9.2.5. ISSUED DIRECT FROM AND SERVICED BY THE ROOF MEMBRANE MANUFACTURER.
 - 1.9.2.6. TRANSFERABLE FOR THE FULL TERM OF THE WARRANTY.
 - 1.9.2.7. NO ADDITIONAL CHARGE FOR THE WARRANTY.

PART 2: PRODUCTS

- 2.1. MANUFACTURER: DURO-LAST ROOFING, INC., WHICH IS LOCATED AT: 525 MORLEY DRIVE, SAGINAW, MI 48601. TELEPHONE: 800-248-0280.
- 2.1.2. ALL ROOFING SYSTEM COMPONENTS TO BE PROVIDED OR APPROVED BY DURO-LAST ROOFING, INC.
- 2.1.3. SUBSTITUTIONS: NOT PERMITTED.
- 2.2. ROOFING SYSTEM COMPONENTS
 - 2.2.1. ROOFING MEMBRANE: DURO-LAST® PVC THERMOPLASTIC MEMBRANE CONFORMING TO ASTM D 4434, TYPE III, FABRIC-REINFORCED, PVC. MEMBRANE PROPERTIES AS FOLLOWS:
 - 2.2.1.1. THICKNESS: 50 MIL.
 - 2.2.1.2. EXPOSED FACE COLOR: 2.2.1.2.1. WHITE.
 - 2.2.2. ACCESSORY MATERIALS: PROVIDE ACCESSORY MATERIALS SUPPLIED BY OR APPROVED FOR USE BY DURO-LAST ROOFING, INC.
 - 2.2.2.1. SHEET FLASHING: MANUFACTURER'S STANDARD REINFORCED PVC SHEET FLASHING.
 - 2.2.2.2. DURO-LAST FACTORY PREFABRICATED FLASHINGS: MANUFACTURED USING MANUFACTURER'S STANDARD REINFORCED PVC/MEMBRANE.
 - 2.2.2.2.1. STACK FLASHINGS.
 - 2.2.2.2.2. CURB FLASHINGS.
 - 2.2.2.3. INSIDE AND OUTSIDE CORNERS.
 - 2.2.2.4. VINYL COATED METAL SCUPPER INSERTS.
 - 2.2.2.5. VINYL COATED PITCH PANS.
 - 2.2.3. SEALANTS AND ADHESIVES: COMPATIBLE WITH ROOFING SYSTEM AND SUPPLIED BY DURO-LAST ROOFING, INC.
 - 2.2.3.1. DURO-GAULK® PLUS.
 - 2.2.3.2. STRIP MASTIC.
 - 2.2.4. SLIP SHEET: COMPATIBLE WITH ROOFING SYSTEM AND SUPPLIED BY DURO-LAST ROOFING, INC.

2.2. FASTENERS AND PLATES

- 2.2.6. CORROSION RESISTANCE PROVISIONS IN FMG 4470, DESIGNED FOR FASTENING MEMBRANE AND INSULATION TO SUBSTRATE. SPECIFIED BY DURO-LAST ROOFING, INC.
- 2.2.6.1. GALVANIZED STEEL FASTENERS.
- 2.2.6.2. METAL PLATES.
- 2.2.6.3. 3 INCH METAL PLATES.
- 2.2.7. TERMINATION AND EDGE DETAILS: SUPPLIED BY DURO-LAST ROOFING, INC.
 - 2.2.7.1. TERMINATION BAR.
 - 2.2.7.2. 2 PIECE COMPRESSION METAL SYSTEM.
 - 2.2.8. VINYL COATED METAL: SUPPLIED BY DURO-LAST ROOFING, INC. 24 GAUGE, HOT-DIPPEL GALVANIZED, GRADE 90 METAL WITH A MINIMUM OF 17 MIL OF DURO-LAST MEMBRANE LAMINATED TO ONE SIDE.
 - 2.2.9. TWO-WAY ROOF VENTS: SUPPLIED BY DURO-LAST ROOFING, INC. INSTALL A MINIMUM OF 1 VENT FOR EACH 1,000 FT² (93 MF) OF ROOF AREA.
 - 2.2.10. COATED GLASS SLIP SHEET:
 - 2.2.10.1. ATLAS FR-10 FIRE RATED SLIP SHEET.
 - 2.2.10.2. 2 PLIES.
 - 2.2.11. WALKWAYS:
 - 2.2.11.1. PROVIDE NON-SKID, MAINTENANCE-FREE WALKWAY PADS IN AREAS OF HEAVY FOOT TRAFFIC AND AROUND MECHANICAL EQUIPMENT.
 - 2.2.11.2. DURO-LAST ROOF TRAKK® III WALKWAY PAD.
- 2.3. ROOF INSULATION
 - 2.3.1. GENERAL:
 - 2.3.1.1. PROVIDE PREFORMED ROOF INSULATION BOARDS THAT COMPLY WITH REQUIREMENTS AND REFERENCED STANDARDS, AS SELECTED FROM MANUFACTURER'S STANDARD SIZES. PROVIDE PREFORMED SADDLES, CRICKETS, AND OTHER INSULATION SHAPES WHERE INDICATED FOR SLOPING TO DRAIN. FABRICATE TO SLOPES INDICATED.
 - 2.3.2. POLYISOCYANURATE BOARD INSULATION, COMPLYING WITH ASTM C 1289, TYPE II, FELT OR GLASS-FIBER MAT FACTER ON BOTH MAJOR SURFACES. MATERIAL AS SUPPLIED BY DURO-LAST.
 - 2.3.2.1. DURO-GUARD® ISO II (FLAT).
 - 2.3.2.2. DURO-GUARD® ISO II (FLAT).
- 2.4. ROOF INSULATION ACCESSORIES
 - 2.4.1. GENERAL: PROVIDE ROOF INSULATION ACCESSORIES APPROVED BY THE ROOF MEMBRANE MANUFACTURER AND AS RECOMMENDED BY INSULATION MANUFACTURER FOR THE INTENDED USE.
 - 2.4.2. FASTENERS: PROVIDE DURO-LAST FACTORY-COATED STEEL FASTENERS AND METAL OR PLASTIC PLATES MEETING CORROSION-RESISTANCE PROVISIONS IN FMG 4470, DESIGNED FOR FASTENING INSULATION AND/OR INSULATION COVER BOARDS IN CONFORMANCE TO SPECIFIED DESIGN REQUIREMENTS.

PART 3: EXECUTION

- 3.1. EXAMINATION
 - 3.1.1. VERIFY THAT THE SURFACES AND SITE CONDITIONS ARE READY TO RECEIVE WORK.
 - 3.1.2. VERIFY THAT THE DECK IS SUPPORTED AND SECURED.
 - 3.1.3. VERIFY THAT THE DECK IS CLEAN AND SMOOTH, FREE OF DEPRESSIONS, WAVES, OR PROJECTIONS, AND PROPERLY SLOPED TO DRAINS, VALLEYS, EAVES, SCUPPERS OR GUTTERS.
 - 3.1.4. VERIFY THAT THE DECK SURFACES ARE DRY AND FREE OF STANDING WATER, ICE OR SNOW.
 - 3.1.5. VERIFY THAT ALL ROOF OPENINGS OR PENETRATIONS THROUGH THE ROOF ARE SOLIDLY SET.
 - 3.1.6. IF SUBSTRATE PREPARATION IS THE RESPONSIBILITY OF ANOTHER CONTRACTOR, NOTIFY ARCHITECT OF UNSATISFACTORY PREPARATION BEFORE PROCEEDING.
- 3.2. PREPARATION
 - 3.2.1. CLEAN SURFACES THOROUGHLY PRIOR TO INSTALLATION.
 - 3.2.2. PREPARE SURFACES USING THE METHODS RECOMMENDED BY THE MANUFACTURER FOR ACHIEVING THE BEST RESULT FOR THE SUBSTRATE UNDER THE PROJECT CONDITIONS.
 - 3.2.3. SURFACES SHALL BE CLEAN, SMOOTH, FREE OF FINES, SHARP EDGES, LOOSE AND FOREIGN MATERIAL, OIL, GREASE, AND BITUMEN.
- 3.3. INSTALLATION
 - 3.3.1. INSTALL INSULATION IN ACCORDANCE WITH THE ROOF MANUFACTURER'S REQUIREMENTS.
 - 3.3.2. SEPARATION SLIP SHEET: ATLAS FR-10 FIRE RATED SLIP SHEET.
 - 3.3.2.1. INSTALL IN ACCORDANCE WITH THE ROOF MANUFACTURER'S REQUIREMENTS.
 - 3.3.3. INSULATION: DURO-GUARD® ISO II (FLAT).
 - 3.3.3.1. INSTALL INSULATION IN ACCORDANCE WITH THE ROOF MANUFACTURER'S REQUIREMENTS.
 - 3.3.3.2. INSULATION SHALL BE ADEQUATELY SUPPORTED TO SUSTAIN NORMAL FOOT TRAFFIC WITHOUT DAMAGE.
 - 3.3.3.3. WHERE FIELD TRIMMED, INSULATION SHALL BE FITTED TIGHTLY AROUND ROOF PROTRUSIONS WITH NO GAPS GREATER THAN 1/4 INCH.
 - 3.3.3.4. NO MORE INSULATION SHALL BE APPLIED THAN CAN BE COVERED WITH THE ROOF MEMBRANE BY THE END OF THE DAY OR THE ONSET OF INCLEMENT WEATHER.

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JPL MANAGEMENT

ISSUE INFORMATION

REVISIONS
