

F. ADJUSTABLE SHELF STANDARDS AND SUPPORTS: BHMA A156.9, B04071; WITH SHELF RESTS, B04081.
 G. SHELF RESTS: BHMA A156.9, B04013; METAL, TWO-PIN TYPE WITH SHELF HOLD-DOWN CLIP.
 H. DRAWER SLIDES: BHMA A156.9.
 1. GRADE 1 AND GRADE 2: SIDE MOUNTED] AND EXTENDING UNDER BOTTOM EDGE OF DRAWER]; FULL-EXTENSION TYPE; EPOXY-COATED STEEL WITH POLYMER ROLLERS.
 3. CUT A HEAD FLAP AT 45-DEGREE ANGLE IN THE WEATHER BARRIER AT WINDOW HEAD TO EXPOSE 8 INCHES OF SHEATHING. TEMPORARILY SECURE WEATHER BARRIER FLAP AWAY FROM SHEATHING WITH TAPE.
 3. FOR DRAWERS NOT MORE THAN 3 INCHES (75 MM) HIGH AND NOT MORE THAN 24 INCHES (600 MM) WIDE, PROVIDE GRADE 1.
 4. FOR DRAWERS MORE THAN 3 INCHES (75 MM) HIGH BUT NOT MORE THAN 6 INCHES (150 MM) HIGH AND NOT MORE THAN 24 INCHES (600 MM) WIDE, PROVIDE GRADE 1.
 5. FOR DRAWERS MORE THAN 6 INCHES (150 MM) HIGH OR MORE THAN 24 INCHES (600 MM) WIDE, PROVIDE GRADE 1HD-100.
 6. FOR COMPUTER KEYBOARD SHELVES, PROVIDE GRADE 1.
 7. FOR TRASH BINS NOT MORE THAN 20 INCHES (500 MM) HIGH AND 18 INCHES (460 MM) WIDE, PROVIDE GRADE 1HD-100.
 L. ALUMINUM SLIDES FOR SLIDING GLASS DOORS: BHMA A156.9, B07063.
 J. DOOR LOCKS: BHMA A156.11, E07121.
 K. DRAWER LOCKS: BHMA A156.11, E07041.
 L. DOOR AND DRAWER SILENCERS: BHMA A156.16, L03011.
 M. EXPOSED HARDWARE FINISHES: FOR EXPOSED HARDWARE, PROVIDE FINISH THAT COMPLIES WITH BHMA A156.18 FOR BHMA FINISH NUMBER INDICATED.
 1. OWNER TO SELECT THE FINISH FOR ALL CABINET HARDWARE

2.5 MISCELLANEOUS MATERIALS

A. FURRING, BLOCKING, SHIMS, AND HANGING STRIPS: FIRE-RETARDANT-TREATED SOFTWOOD LUMBER, KILN DRIED TO LESS THAN 15 PERCENT MOISTURE CONTENT.
 B. ANCHORS: SELECT MATERIAL, TYPE, SIZE, AND FINISH REQUIRED FOR EACH SUBSTRATE FOR SECURE ANCHORAGE. PROVIDE METAL EXPANSION SLEEVES OR EXPANSION BOLTS FOR POST-INSTALLED ANCHORS. USE NONFERROUS METALS OR HOT-DIP GALVANIZED ANCHORS AND INSERTS AT INSIDE FACE OF EXTERIOR WALLS AND AT FLOORS.

2.6 FABRICATION
 A. COMPLETE FABRICATION, INCLUDING ASSEMBLY AND HARDWARE APPLICATION, TO MAXIMUM EXTENT POSSIBLE BEFORE SHIPMENT TO PROJECT SITE. DISASSEMBLE COMPONENTS ONLY AS NECESSARY FOR SHIPMENT AND INSTALLATION. WHERE NECESSARY FOR FITTING AT SITE, PROVIDE AMPLE ALLOWANCE FOR SCRIBING, TRIMMING, AND FITTING.
 B. SHOP-CUT OPENINGS TO MAXIMUM EXTENT POSSIBLE TO RECEIVE HARDWARE, APPLIANCES, ELECTRICAL WORK, AND SIMILAR ITEMS. LOCATE OPENINGS ACCURATELY AND USE TEMPLATES OR ROUGHING-IN DIAGRAMS TO PRODUCE ACCURATELY SIZED AND SHAPED OPENINGS. SAND EDGES OF CUTOUTS TO REMOVE SPLINTERS AND BURRS.
 C. INSTALL GLASS TO COMPLY WITH APPLICABLE REQUIREMENTS IN SECTION 080800 "GLAZING" AND IN GANA'S "GLAZING MANUAL," FOR GLASS IN WOOD FRAMES, SECURE GLAZING WITH REMOVABLE STOPS.

PART 3 – EXECUTION

3.1 PREPARATION

A. BEFORE INSTALLATION, CONDITION CABINETS TO AVERAGE PREVAILING HUMIDITY CONDITIONS IN INSTALLATION AREAS.

3.2 INSTALLATION

A. GRADE: INSTALL CABINETS TO COMPLY WITH SAME GRADE AS ITEM TO BE INSTALLED.
 B. INSTALL CABINETS LEVEL, PLUMB, TRUE, AND STRAIGHT. SHIM AS REQUIRED WITH CONCEALED SHIMS. INSTALL LEVEL AND PLUMB TO A TOLERANCE OF 1/8 INCH IN 96 INCHES (3 MM IN 2400 MM).
 C. SCRIBE AND CUT CABINETS TO FIT ADJOINING WORK, REFINISH CUT SURFACES, AND REPAIR DAMAGED FINISH AT CUTS.
 D. ANCHOR CABINETS TO ANCHORS OR BLOCKING BUILT IN OR DIRECTLY ATTACHED TO SUBSTRATES. SECURE WITH COUNTERSUNK, CONCEALED FASTENERS AND BLIND NAILING. USE FINE FINISHING NAILS OR FINISHING SCREWS FOR EXPOSED FASTENING, COUNTERSUNK AND FILLED FLUSH WITH WOODWORK.
 E. CABINETS: INSTALL WITHOUT DISTORTION SO DOORS AND DRAWERS FIT OPENINGS PROPERLY AND ARE ACCURATELY ALIGNED. ADJUST HARDWARE TO CENTER DOORS AND DRAWERS IN OPENINGS AND TO PROVIDE UNENCUMBERED OPERATION. COMPLETE INSTALLATION OF HARDWARE AND ACCESSORY ITEMS AS INDICATED.
 1. INSTALL CABINETS WITH NO MORE THAN 1/8 INCH IN 96-INCH (3 MM IN 2400-MM) SAG, BOW, OR OTHER VARIATION FROM A STRAIGHT LINE.
 2. FASTEN WALL CABINETS THROUGH BACK, NEAR TOP AND BOTTOM, AND AT ENDS NOT MORE THAN 16 INCHES (400 MM) O.C. WITH NO. 10 WAFER-HEAD SCREWS SIZED FOR NOT LESS THAN 1-1/2-INCH (38-MM) PENETRATION INTO WOOD FRAMING, BLOCKING, OR HANGING STRIPS.

END OF SECTION

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

SECTION 07 21 00 – BUILDING INSULATION

PART 1.GENERAL

1.01SECTION INCLUDES

A. BOARD THERMAL INSULATION AT PERIMETER FOUNDATION WALL (WHEN REQUIRED).
 B. BATT THERMAL INSULATION IN EXTERIOR WALL AND ROOF CONSTRUCTION.
 1A 2x4 STUD WALL
 1B 2x4 STUD WALL W/R13 BATT INSULATION
 1C 2x4 STUD WALL W/R13 BATT INSULATION, 1 HOUR RATING
 1D (2) 2x4 STUD WALL W/R13 BATT INSULATION

1.02 ENVIRONMENTAL REQUIREMENTS

A. INSTALL INSULATION ADHESIVES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

PART 2 PRODUCTS

2.01 INSULATION MATERIALS

A. EXTRUDED POLYSTYRENE INSULATION: ASTM C578-15B, CELLULAR TYPE, CONFORMING TO THE FOLLOWING:
 1. THERMAL RESISTANCE: R OF 5.0.
 2. THICKNESS: THICKNESS INDICATED INCH THICK.
 3. COMPRESSIVE STRENGTH: MINIMUM 30 PSI.
 4. WATER ABSORPTION: IN ACCORDANCE WITH ASTM D2842-12 0.3 PERCENT BY VOLUME MAXIMUM.
 5. EDGES: SQUARE EDGES.
 6. FLAME/SMOKE PROPERTIES: IN ACCORDANCE WITH ASTM E84, UL 723, AND NFPA 255.
 B. BATT INSULATION: ASTM C665, PREFORMED GLASS FIBER BATT, CONFORMING TO THE FOLLOWING:
 1. THERMAL RESISTANCE: R-19 FOR WALLS & R-30 FOR ATTIC.
 2. FACING: FACED ON ONE SIDE WITH KRAFT PAPER.

2.02ADHESIVES

A. ADHESIVE: TYPE RECOMMENDED BY INSULATION MANUFACTURER FOR APPLICATION.

PART 3EXECUTION

3.01 EXAMINATION AND PREPARATION

A. VERIFY THAT SUBSTRATE, ADJACENT MATERIALS, AND INSULATION BOARDS ARE DRY AND READY TO RECEIVE INSULATION AND/OR ADHESIVE.

3.02 INSTALLATION - FOUNDATION PERIMETER - BOARD INSULATION

A. ADHERE A STRIP OF POLYETHYLENE SHEET OVER SUBSTRATE JOINTS WITH BEADS OF TYPE 1 ADHESIVE.
 B. APPLY SAME ADHESIVE AND INSTALL BOARDS ON FOUNDATION PERIMETER. STAGGER JOINTS. BUTT EDGES AND ENDS TIGHT TO ADJACENT BOARD AND TO PROTRUSIONS.

3.03 INSTALLATION - BATT INSULATION

A. INSTALL INSULATION IN ACCORDANCE WITH INSULATION MANUFACTURER'S INSTRUCTIONS.
 B. INSTALL IN EXTERIOR WALLS AND CEILING SPACES WITHOUT GAPS OR VOIDS.
 C. FIT INSULATION TIGHT IN SPACES. LEAVE NO GAPS OR VOIDS.
 D. INSTALL WITH FACTORY APPLIED MEMBRANE FACING WARM SIDE OF BUILDING SPACES. ATTACH FLANGES OF FACING TO FRAMING MEMBERS.
 E. USE 1/8" DIAMETER PENCIL RODS FRICTION FIT BETWEEN TRUSSES.

SECTION 07 25 00 – WEATHER BARRIERS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. WEATHER BARRIER MEMBRANE (DUPONT™ TYVEK® COMMERCIAL WRAP®)
 B. SEAM TAPE (DUPONT™ TYVEK® TAPE)
 C. FLASHING (DUPONT™ FLEXWRAP™, DUPONT™ FLEXWRAP™ NF, DUPONT™ STRAIGHTFLASH™, DUPONT™ STRAIGHTFLASH™ VF, AND/OR DUPONT™ THRU-WALL FLASHING)
 D. FASTENERS (DUPONT™ TYVEK® WRAP CAPS)

1.2 REFERENCES

A. ASTM INTERNATIONAL
 1. ASTM C920; STANDARD SPECIFICATION FOR ELASTOMERIC JOINT SEALANTS
 2. ASTM C1193; STANDARD GUIDE FOR USE OF JOINT SEALANTS
 3. ASTM D882; TEST METHOD FOR TENSILE PROPERTIES OF THIN PLASTIC SHEETING
 4. ASTM D117; STANDARD GUIDE FOR EVALUATING NON-WOVEN FABRICS
 5. ASTM E84; TEST METHOD FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS
 6. ASTM E96; TEST METHOD FOR WATER VAPOR TRANSMISSION OF MATERIALS
 7. ASTM E1677; SPECIFICATION FOR AIR RETARDER MATERIAL OR SYSTEM FOR FRAMED BUILDING WALLS
 8. ASTM E2178; TEST METHOD FOR AIR PERMEANCE OF BUILDING MATERIALS
 9. ASTM E2357; STANDARD TEST METHOD FOR DETERMINING AIR LEAKAGE ON AIR BARRIER ASSEMBLIES
 B. AATCC – AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS
 1. TEST METHOD 127 WATER RESISTANCE: HYDROSTATIC PRESSURE TEST
 C. TAPPI
 1. TEST METHOD T-410; GRAMS OF PAPER AND PAPERBOARD (WEIGHT PER UNIT AREA)
 2. TEST METHOD T-460; AIR RESISTANCE (GURLEY HILL METHOD)

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. DUPONT: 4417 LANCASTER PIKE, CHESTNUT RUN PLAZA 728, WILMINGTON, DE 19805; 1-800-44-TYVEK (8-9835); HTTP://WWW.CONSTRUCTION.TYVEK.COM

2.2 MATERIALS

A. BASIS OF DESIGN: SPUNBONDED POLYOLEFIN, NON-WOVEN, NON-PERFORATED, WEATHER BARRIER IS BASED UPON DUPONT™ TYVEK® COMMERCIAL WRAP® AND RELATED ASSEMBLY COMPONENTS.
 B. PERFORMANCE CHARACTERISTICS:
 1. AIR PENETRATION: 0.001 CFM/FT² AT 75 PA, WHEN TESTED IN ACCORDANCE WITH ASTM E2178. TYPE 1 PER ASTM E1677, ±0.04 CFM/FT² AT 75 PA, WHEN TESTED IN ACCORDANCE WITH ASTM E2357
 2. WATER VAPOR TRANSMISSION: 28 PERMS, WHEN TESTED IN ACCORDANCE WITH ASTM E96, METHOD B.
 3. WATER PENETRATION RESISTANCE: 280 CM WHEN TESTED IN ACCORDANCE WITH AATCC TEST METHOD 127.
 4. BASIS WEIGHT: 2.7 OZ/YD², WHEN TESTED IN ACCORDANCE WITH TAPPI TEST METHOD T-410.

5. AIR RESISTANCE: AIR INFILTRATION AT >1500 SECONDS, WHEN TESTED IN ACCORDANCE WITH TAPPI TEST METHOD T-460.
 6. TENSILE STRENGTH: 38/35 LBS/IN., WHEN TESTED IN ACCORDANCE WITH ASTM D882, METHOD A.
 7. TEAR RESISTANCE: 12/10 LBS., WHEN TESTED IN ACCORDANCE WITH ASTM D117.
 8. SURFACE BURNING CHARACTERISTICS: CLASS A, WHEN TESTED IN ACCORDANCE WITH ASTM E 84. FLAME SPREAD: 10, SMOKE DEVELOPED: 10.

2.3 ACCESSORIES

A. SEAM TAPE: 3 INCH WIDE, DUPONT™ TYVEK® TAPE FOR COMMERCIAL APPLICATIONS.
 B. FASTENERS:
 1. TYVEK® WRAP CAPS, AS DISTRIBUTED BY DUPONT: #4 NAILS WITH LARGE 1-INCH PLASTIC CAP FASTENERS, OR 1-INCH PLASTIC CAP STAPLES WITH LEG LENGTH SUFFICIENT TO ACHIEVE A MINIMUM PENETRATION OF 5/8-INCH INTO THE WOOD STUD.
 C. SEALANTS
 REFER TO SECTION [07 92 00 JOINT SEALANTS] [INSERT SECTION NUMBER AND TITLE].
 2. PROVIDE SEALANTS THAT COMPLY WITH ASTM C920, ELASTOMERIC POLYMER SEALANT TO MAINTAIN WATERTIGHT CONDITIONS.
 3. PRODUCTS:
 A. DUPONT™ COMMERCIAL SEALANT
 B. SEALANTS RECOMMENDED BY THE WEATHER BARRIER MANUFACTURER.
 D. ADHESIVES:
 1. PROVIDE ADHESIVE RECOMMENDED BY WEATHER BARRIER MANUFACTURER.
 2. PRODUCTS:
 A. LIGNO NAIL® LN-109
 B. DENSO BUTYL LIQUID
 C. 3M HIGH STRENGTH 90
 D. SIA 655
 E. ADHESIVES RECOMMEND BY THE WEATHER BARRIER MANUFACTURER.
 E. PRIMERS:
 1. PROVIDE FLASHING MANUFACTURER RECOMMENDED PRIMER TO ASSIST IN ADHESION BETWEEN SUBSTRATE AND FLASHING.
 2. PRODUCTS:
 A. 3M HIGH STRENGTH 90
 B. DENSO BUTYL SPRAY
 C. SIA 655
 D. PERMACRIP 105
 E. ITW TACC STA™ PUT SPH
 F. PRIMERS RECOMMENDED BY THE FLASHING MANUFACTURER
 F. FLASHING
 1. DUPONT™ FLEXWRAP™, AS DISTRIBUTED BY DUPONT: FLEXIBLE MEMBRANE FLASHING MATERIALS FOR WINDOW OPENINGS AND PENETRATIONS.
 2. DUPONT™ FLEXWRAP™ NF, AS DISTRIBUTED BY DUPONT: FLEXIBLE MEMBRANE FLASHING MATERIALS FOR WINDOW OPENINGS AND PENETRATIONS.
 3. DUPONT™ STRAIGHTFLASH™, AS DISTRIBUTED BY DUPONT: STRAIGHT FLASHING MEMBRANE MATERIALS FOR FLASHING WINDOWS AND DOORS AND SEALING PENETRATIONS SUCH AS MASONRY TIES, ETC.
 4. DUPONT™ STRAIGHTFLASH™ VF, AS DISTRIBUTED BY DUPONT: DUAL-SIDED STRAIGHT FLASHING MEMBRANE MATERIALS FOR BRICK MOLD AND NON-FLANGED WINDOWS AND DOORS.
 5. DUPONT™ THRU-WALL SURFACE ADHERED MEMBRANE WITH INTEGRATED DRIP EDGE: THRU-WALL FLASHING MEMBRANE MATERIALS FOR FLASHING AT CHANGES IN DIRECTION OR ELEVATION (SHELF ANGLES, FOUNDATIONS, ETC.) AND AT TRANSITIONS BETWEEN DIFFERENT ASSEMBLY MATERIALS.
 6. PREFORMED INSIDE AND OUTSIDE CORNERS AND END DAMS AS DISTRIBUTED BY DUPONT: PREFORMED THREE-DIMENSIONAL SHIMES TO COMPLETE THE FLASHING SYSTEM USED IN CONJUNCTION WITH DUPONT™ THRU-WALL FLASHING.

PART 3 - EXECUTION

3.1 EXAMINATION

A. VERIFY SUBSTRATE AND SURFACE CONDITIONS ARE IN ACCORDANCE WITH WEATHER BARRIER MANUFACTURER RECOMMENDED TOLERANCES PRIOR TO INSTALLATION OF WEATHER BARRIER AND ACCESSORIES.

3.2 INSTALLATION – WEATHER BARRIER

A. INSTALL WEATHER BARRIER OVER EXTERIOR FACE OF EXTERIOR WALL SUBSTRATE IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
 B. INSTALL WEATHER BARRIER PRIOR TO INSTALLATION OF WINDOWS AND DOORS.
 C. START WEATHER BARRIER INSTALLATION AT A BUILDING CORNER, LEAVING 6-12 INCHES OF WEATHER BARRIER EXTENDED BEYOND CORNER TO OVERLAP.
 D. INSTALL WEATHER BARRIER IN A HORIZONTAL MANNER STARTING AT THE LOWER PORTION OF THE WALL SURFACE WITH SUBSEQUENT LAYERS INSTALLED IN A SHINGLING MANNER TO OVERLAP LOWER LAYERS. MAINTAIN WEATHER BARRIER PLUMB AND LEVEL.
 E. SILL PLATE INTERFACE: EXTEND LOWER EDGE OF WEATHER BARRIER OVER SILL PLATE INTERFACE 3-6 INCHES. SECURE TO FOUNDATION WITH ELASTOMERIC SEALANT AS RECOMMENDED BY WEATHER BARRIER MANUFACTURER.
 F. WINDOW AND DOOR OPENINGS: EXTEND WEATHER BARRIER COMPLETELY OVER OPENINGS.
 G. OVERLAP WEATHER BARRIER
 1. EXTERIOR CORNERS: MINIMUM 12 INCHES.
 2. SEAMS: MINIMUM 6 INCHES.
 H. WEATHER BARRIER ATTACHMENT:
 1. ATTACH WEATHER BARRIER TO STUDS THROUGH EXTERIOR SHEATHING. SECURE USING WEATHER BARRIER MANUFACTURER RECOMMENDED FASTENERS, SPACE 12 -18 INCHES VERTICALLY ON CENTER ALONG STUD LINE, AND 24 INCH ON CENTER, MAXIMUM HORIZONTALLY.
 I. APPLY 4 INCH BY 7 INCH PIECE OF DUPONT™ STRAIGHTFLASH™ OR WEATHER BARRIER MANUFACTURER APPROVED ALTERNATE TO WEATHER BARRIER MEMBRANE PRIOR TO THE INSTALLATION CLADDING ANCHORS.

3.3 SEALING

A. SEAL SEAMS OF WEATHER BARRIER WITH SEAM TAPE AT ALL VERTICAL AND HORIZONTAL OVERLAPPING SEAMS.

B. SEAL ANY TEARS OR CUTS AS RECOMMENDED BY WEATHER BARRIER MANUFACTURER.

3.4 OPENING PREPARATION (FOR USE WITH NON-FLANGED WINDOWS – ALL CLADDING TYPES)

A. FLUSH CUT WEATHER BARRIER AT EDGE OF SHEATHING AROUND FULL PERIMETER OF OPENING.
 B. CUT A HEAD FLAP AT 45-DEGREE ANGLE IN THE WEATHER BARRIER AT WINDOW HEAD TO EXPOSE 8 INCHES OF SHEATHING. TEMPORARILY SECURE WEATHER BARRIER FLAP AWAY FROM SHEATHING WITH TAPE.

3.5 FLASHING (FOR USE WITH NON-FLANGED WINDOWS – ALL CLADDING TYPES)

A. CUT [7-INCH] [9-INCH] WIDE DUPONT™ FLEXWRAP™ OR DUPONT™ FLEXWRAP™ NF A MINIMUM OF 12 INCHES LONGER THAN WIDTH OF SILL ROUGH OPENING. APPLY PRIMER AS REQUIRED BY MANUFACTURER.
 B. COVER HORIZONTAL SILL BY ALIGNING DUPONT™ FLEXWRAP™ EDGE WITH INSIDE EDGE OF SILL. ADHERE TO ROUGH OPENING ACROSS SILL AND UP JAMBS A MINIMUM OF 6 INCHES. SECURE FLASHING TIGHTLY INTO CORNERS BY WORKING IN ALONG THE SILL BEFORE ADHERING UP THE JAMBS.
 C. FAN DUPONT™ FLEXWRAP™ AT BOTTOM CORNERS ONTO FACE OF WALL. FIRMLY PRESS IN PLACE. MECHANICALLY FASTEN FANNED EDGES. MECHANICAL FASTENING IS NOT REQUIRED FOR DUPONT™ FLEXWRAP™ NF.
 D. APPLY 9-INCH WIDE STRIPS OF DUPONT™ STRAIGHTFLASH™ AT JAMBS. ALIGN FLASHING WITH INTERIOR EDGE OF JAMB FRAMING. START DUPONT™ STRAIGHTFLASH™ AT HEAD OF OPENING AND LAP SILL FLASHING DOWN TO THE SILL.
 E. SPRAY-APPLY PRIMER TO TOP 6 INCHES OF JAMBS AND EXPOSED SHEATHING.
 F. INSTALL DUPONT™ FLEXWRAP™ DUPONT™ FLEXWRAP™ NF AT OPENING HEAD USING SAME INSTALLATION PROCEDURES USED AT SILL. OVERLAP JAMB FLASHING A MINIMUM OF 2 INCHES.
 G. COORDINATE FLASHING WITH WINDOW INSTALLATION.
 H. ON EXTERIOR, INSTALL BACKER-ROD IN JOINT BETWEEN WINDOW FRAME AND FLASHED ROUGH FRAMING. APPLY SEALANT AT JAMBS AND HEAD, LEAVING SILL UNSEALED. APPLY SEALANTS IN ACCORDANCE WITH SEALANT MANUFACTURER'S INSTRUCTIONS AND ASTM C 1193.
 I. POSITION WEATHER BARRIER HEAD FLAP ACROSS HEAD FLASHING; ADHERE USING 4-INCH WIDE DUPONT™ STRAIGHTFLASH™ OVER THE 45-DEGREE SEAMS.
 J. TAPE TOP OF WINDOW IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
 K. ON INTERIOR, INSTALL BACKER ROD IN JOINT BETWEEN FRAME OF WINDOW AND FLASHED ROUGH FRAMING. APPLY SEALANT AROUND ENTIRE WINDOW TO CREATE AIR SEAL. APPLY SEALANT IN ACCORDANCE WITH SEALANT MANUFACTURER'S INSTRUCTIONS AND ASTM C 1193.

3.6 OPENING PREPARATION (FOR USE WITH FLANGED WINDOWS)

A. CUT WEATHER BARRIER IN AN "I-CUT" PATTERN. A MODIFIED I-CUT IS ALSO ACCEPTABLE.
 1. CUT WEATHER BARRIER HORIZONTALLY ALONG THE BOTTOM AND TOP OF THE WINDOW OPENING.
 2. FROM THE TOP CENTER OF THE WINDOW OPENING, CUT WEATHER BARRIER VERTICALLY DOWN TO THE SILL.
 3. FOLD SIDE AND BOTTOM WEATHER BARRIER FLAPS INTO WINDOW OPENING AND FASTEN.
 B. CUT A HEAD FLAP AT 45-DEGREE ANGLE IN THE WEATHER BARRIER AT WINDOW HEAD TO EXPOSE 8 INCHES OF SHEATHING. TEMPORARILY SECURE WEATHER BARRIER FLAP AWAY FROM SHEATHING WITH TAPE.

3.7 FLASHING (FOR USE WITH FLANGED WINDOWS)

A. CUT [7-INCH] [9-INCH] WIDE DUPONT™ FLEXWRAP™ OR DUPONT™ FLEXWRAP™ NF A MINIMUM OF 12 INCHES LONGER THAN WIDTH OF SILL ROUGH OPENING.
 B. COVER HORIZONTAL SILL BY ALIGNING DUPONT™ FLEXWRAP™ EDGE WITH INSIDE EDGE OF SILL. ADHERE TO ROUGH OPENING ACROSS SILL AND UP JAMBS A MINIMUM OF 6 INCHES. SECURE FLASHING TIGHTLY INTO CORNERS BY WORKING IN ALONG THE SILL BEFORE ADHERING UP THE JAMBS.
 C. FAN DUPONT™ FLEXWRAP™ AT BOTTOM CORNERS ONTO FACE OF WALL. FIRMLY PRESS IN PLACE. MECHANICALLY FASTEN FANNED EDGES. MECHANICAL FASTENING IS NOT REQUIRED FOR DUPONT™ FLEXWRAP™ NF.
 D. ON EXTERIOR, INSTALL BACKER-ROD IN JOINT BETWEEN WALL OR BACKSIDE OF WINDOW MOUNTING FLANGE ACROSS JAMBS AND HEAD. DO NOT APPLY SEALANT ACROSS SILL.
 E. INSTALL WINDOW ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
 F. APPLY 4-INCH WIDE STRIPS OF DUPONT™ STRAIGHTFLASH™ AT JAMBS OVERLAPPING ENTIRE MOUNTING FLANGE. EXTEND JAMB FLASHING 1-INCH ABOVE TOP OF ROUGH OPENING AND BELOW BOTTOM EDGE OF SILL FLASHING.
 G. APPLY 4-INCH WIDE STRIP OF DUPONT™ STRAIGHTFLASH™ AS HEAD FLASHING OVERLAPPING THE MOUNTING FLANGE. HEAD FLASHING SHOULD EXTEND BEYOND OUTSIDE EDGES OF BOTH JAMB FLASHINGS.
 H. POSITION WEATHER BARRIER HEAD FLAP ACROSS HEAD FLASHING; ADHERE USING 4-INCH WIDE DUPONT™ STRAIGHTFLASH™ OVER THE 45-DEGREE SEAMS.
 I. TAPE HEAD FLAP IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
 J. ON INTERIOR, INSTALL BACKER ROD IN JOINT BETWEEN FRAME OF WINDOW AND FLASHED ROUGH FRAMING. APPLY SEALANT AROUND ENTIRE WINDOW TO CREATE AIR SEAL. APPLY SEALANT IN ACCORDANCE WITH SEALANT MANUFACTURER'S INSTRUCTIONS AND ASTM C 1193.

3.8 THRU-WALL FLASHING INSTALLATION

A. APPLY PRIMER PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
 B. INSTALL PREFORMED CORNERS AND END DAMS BEDED IN SEALANT IN APPROPRIATE LOCATIONS ALONG WALL.
 C. STARTING AT A CORNER, REMOVE RELEASE SHEET AND APPLY MEMBRANE TO PRIMED SURFACES IN LENGTHS OF 8 TO 10 FEET.
 D. EXTEND MEMBRANE THROUGH WALL AND LEAVE ¼ INCH MINIMUM EXPOSED TO FORM DRIP EDGE.
 E. ROLL FLASHING INTO PLACE. ENSURE CONTINUOUS AND DIRECT CONTACT WITH SUBSTRATE.
 F. LAP ENDS AND OVERLAP PREFORMED CORNERS 4 INCHES MINIMUM. SEAL ALL LAPS WITH SEALANT.

G. TRIM EXTERIOR EDGE OF MEMBRANE 1-INCH AND SECURE METAL DRIP EDGE PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
 H. TERMINATE MEMBRANE ON VERTICAL WALL. [TERMINATE INTO REGLET, COUNTERFLASHING OR WITH TERMINATION BAR].
 I. APPLY SEALANT BEAD AT EACH TERMINATION.

3.9 THRU-WALL FLASHING / WEATHER BARRIER INTERFACE AT BASE OF WALL

A. OVERLAP THRU-WALL FLASHING WITH WEATHER BARRIER BY 6-INCHES.
 B. MECHANICALLY FASTEN BOTTOM OF WEATHER BARRIER THROUGH TOP OF THRU-WALL FLASHING.
 C. SEAL VERTICAL AND HORIZONTAL SEAMS WITH TAPE OR SEALING MEMBRANE.

3.10 THRU-WALL FLASHING / WEATHER BARRIER INTERFACE AT SHELF ANGLE

A. SEAL WEATHER BARRIER TO BOTTOM OF SHELF ANGLE WITH SEALING MEMBRANE.
 B. APPLY THRU-WALL FLASHING TO TOP OF SHELF ANGLE. OVERLAP THRU-WALL FLASHING WITH WEATHER BARRIER BY 6-INCHES.
 C. SEAL BOTTOM OF WEATHER BARRIER TO THRU-WALL FLASHING WITH TAPE OR SEALING MEMBRANE.

3.11 THRU-WALL FLASHING / WEATHER BARRIER INTERFACE AT WINDOW HEAD

A. CUT FLAP IN WEATHER BARRIER AT WINDOW HEAD.
 B. PRIME EXPOSED SHEATHING.
 C. INSTALL LINTEL AS REQUIRED. VERIFY END DAMS EXTEND 4 INCHES MINIMUM BEYOND OPENING.
 D. INSTALL END DAMS BEDED IN SEALANT.
 E. ADHERE 2 INCHES MINIMUM THRU-WALL FLASHING TO WALL SHEATHING. OVERLAP LINTEL WITH THRU-WALL FLASHING AND EXTEND ¼ INCH MINIMUM BEYOND OUTSIDE EDGE OF LINTEL TO FORM DRIP EDGE.
 F. APPLY SEALANT ALONG THRU-WALL FLASHING EDGES.
 G. FOLD WEATHER BARRIER FLAP BACK INTO PLACE AND TAPE BOTTOM EDGE TO THRU-WALL FLASHING.
 H. TAPE DIAGONAL CUTS OF WEATHER BARRIER.
 I. SECURE WEATHER BARRIER FLAP WITH FASTENERS.

3.12 FIELD QUALITY CONTROL

A. NOTIFY MANUFACTURER'S DESIGNATED REPRESENTATIVE TO OBTAIN (REQUIRED) PERIODIC OBSERVATIONS OF WEATHER BARRIER ASSEMBLY INSTALLATION.

3.14 PROTECTION

A. PROTECT INSTALLED WEATHER BARRIER FROM DAMAGE.

END OF SECTION

SECTION 07 31 13 – ASPHALT SHINGLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. GRANULE SURFACED ASPHALT SHINGLE ROOFING.
 B. MOISTURE SHEDDING UNDERLAYMENT, EAVES, VALLEY AND RIDGE PROTECTION.
 C. METAL FLASHING ASSOCIATED WITH SHINGLE ROOFING.
 D. ATTIC VENTILATION.

1.02 RELATED SECTIONS

A. SECTION 061000 - ROUGH CARPENTRY: FRAMING, WOOD DECKING, AND ROOF SHEATHING.
 B. SECTION 061500 - WOOD DECKING
 C. SECTION 071354 - SHEET WATERPROOFING
 D. SECTION 072600 - VAPOR RETARDERS
 E. SECTION 076000 - FLASHING AND SHEET METAL: SHEET METAL FLASHING NOT ASSOCIATED WITH SHINGLE ROOFING; GUTTERS AND DOWNSPOUTS.
 F. SECTION 077200 - ROOF ACCESSORIES FOR RIDGE VENTS

1.03 REFERENCES

A. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) - ANNUAL BOOK OF ASTM STANDARDS
 1. ASTM A653/A653M-15 - STANDARD SPECIFICATION FOR STEEL SHEET, ZINC COATED (GALVANIZED) OR ZINC-IRON ALLOY-COATED (GALVANNEALED) BY THE HOT-DIP PROCESS.
 2. ASTM D209-14 - STANDARD SPECIFICATION FOR ALUMINUM AND ALUMINUM-ALLOY SHEET AND PLATE.
 3. ASTM D226/D226M-09 - STANDARD SPECIFICATION FOR ASPHALT-SATURATED ORGANIC FELT USED IN ROOFING AND WATERPROOFING.
 4. ASTM B370-12 - STANDARD SPECIFICATION FOR COPPER SHEET AND STRIP FOR BUILDING CONSTRUCTION.
 5. ASTM D1970/D1970M-15a - STANDARD SPECIFICATION FOR SELF-ADHERING POLYMER MODIFIED BITUMINOUS SHEET MATERIALS USED AS STEEP ROOFING UNDERLAYMENT FOR ICE DAM PROTECTION.
 6. ASTM D3161/D3161M-16 - STANDARD TEST METHOD FOR WIND-RESISTANCE OF ASPHALT SHINGLES (FAN INDUCED METHOD).
 7. ASTM D3462/D3462M-10a - STANDARD SPECIFICATION FOR ASPHALT SHINGLES MADE FROM GLASS FELT AND SURFACED WITH MINERAL GRANULES.
 8. ASTM D4586/D4586M-07(2012)e1 - STANDARD SPECIFICATION FOR ASPHALT ROOF CEMENT, ASBESTOS-FREE.
 9. ASTM D4869/D4869M-16 - STANDARD SPECIFICATION FOR ASPHALT -SATURATED ORGANIC FELT UNDERLAYMENT USED IN STEEP SLOPE ROOFING.
 10. ASTM D7158/D7158M-11 - STANDARD TEST METHOD FOR WIND-RESISTANCE OF SEALED ASPHALT SHINGLES (UPLIFT FORCE/UPLIFT RESISTANCE METHOD).
 11. ASTM E108-11 - STANDARD TEST METHOD FOR FIRE TEST OF ROOF COVERINGS.
 B. UNDERWRITERS LABORATORIES (UL) - ROOFING SYSTEMS AND MATERIALS GUIDE
 1. UL 790 - STANDARD TEST METHODS FOR FIRE TESTS OF ROOF COVERINGS.
 2. UL 2218 - IMPACT RESISTANCE OF PREPARED ROOF COVERING MATERIALS.
 C. ASPHALT ROOFING MANUFACTURERS ASSOCIATION (ARMA)
 D. SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC. (SMACNA) - ARCHITECTURAL SHEET METAL MANUAL.
 E. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)

F. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE).

1.04 DEFINITIONS

A. ROOFING TERMINOLOGY: REFER TO ASTM D1079 AND THE GLOSSARY OF THE NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA) ROOFING AND WATERPROOFING MANUAL FOR DEFINITIONS OF ROOFING TERMS RELATED TO THIS SECTION.

1.05 SUBMITTALS

A. PRODUCT DATA: PROVIDE COPIES OF MANUFACTURER'S PRODUCT DATA INFORMATION AND SAMPLES FOR EACH TYPE OF ROOFING PRODUCT.
 B. MANUFACTURER'S APPLICATION INSTRUCTIONS: PROVIDE MANUFACTURER'S APPLICATION INSTRUCTIONS THAT INDICATE PREPARATION REQUIRED, INSTALLATION PROCEDURES, AND DETAIL DRAWINGS.
 C. SHOP DRAWINGS: PROVIDE DRAWINGS TO INDICATE SPECIALLY CONFIGURED METAL FLASHING, JOINTING METHODS AND LOCATIONS AND INSTALLATION DETAILS AS REQUIRED BY PROJECT CONDITIONS INDICATED.

1.05 QUALITY ASSURANCE

A. MANUFACTURER QUALIFICATIONS: PROVIDE ALL PRIMARY ROOFING PRODUCTS, INCLUDING SHINGLES, UNDERLAYMENT, SHEET MEMBRANE-EAVES PROTECTION MEMBRANE, AND RIDGE VENTILATION, OFFERED BY A SINGLE MANUFACTURER.
 B. INSTALLER QUALIFICATIONS: INSTALLER MUST BE LICENSED OR OTHERWISE AUTHORIZED BY ALL FEDERAL, STATE AND LOCAL AUTHORITIES FOR INSTALLATION OF ALL ROOFING PRODUCTS TO BE INSTALLED UNDER THIS SECTION.

1.06 REGULATORY REQUIREMENTS

A. PROVIDE A ROOFING SYSTEM ACHIEVING AN UNDERWRITERS LABORATORIES (UL) CLASS A FIRE CLASSIFICATION.
 B. INSTALL ALL ROOFING PRODUCTS IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL BUILDING CODES.
 C. ALL WORK SHALL BE PERFORMED IN A MANNER CONSISTENT WITH CURRENT OSHA GUIDELINES.

1.07 DELIVERY, STORAGE, AND HANDLING

A. DELIVER SHINGLES AND OTHER MATERIALS TO SITE IN MANUFACTURER'S UNOPENED LABELED PACKAGING. PROMPTLY VERIFY QUANTITIES AND CONDITIONS. IMMEDIATELY REMOVE DAMAGED PRODUCTS FROM SITE.
 B. STORE ALL PRODUCTS IN MANUFACTURER'S UNOPENED, LABELED PACKAGING UNTIL THEY ARE READY FOR INSTALLATION.
 C. STORE BUNDLES ON A FLAT SURFACE. MAXIMUM STACKING HEIGHT SHALL NOT EXCEED TAMKO'S RECOMMENDATIONS. STORE ALL ROLLS ON END.
 D. STORE AND DISPOSE OF SOLVENT-BASED MATERIAL

7. COVERAGE DOES NOT INCLUDE COST OF TEAR-OFF, REMOVAL AND DISPOSAL ON TAMKO FIBERGLASS SHINGLES LIMITED WARRANTY PROJECTS.
8. EXCLUSIONS: SEE TAMKO FIBERGLASS SHINGLES LIMITED WARRANTY FOR EXCLUSIONS AND OTHER IMPORTANT DETAILS. CONTACT TAMKO FOR A COPY OF THE LIMITED WARRANTY.

PART II PRODUCTS

2.01 MANUFACTURERS

A. ACCEPTABLE MANUFACTURERS: TAMKO® BUILDING PRODUCTS, INC., 220 WEST 4TH STREET, JOPLIN, MO. TOLL FREE: 1-800-641-4691.
 B. REQUESTS FOR SUBSTITUTIONS WILL BE CONSIDERED DURING THE BIDDING PHASE.

2.02 SHINGLES

A. HERITAGE® SHINGLES: SELF-SEALING, GRANULE SURFACE LAMINATED ASPHALT SHINGLE WITH A STRONG FIBERGLASS MAT REINFORCEMENT, UNIQUE BLENDS OF GRANULES, SHADOWTONE® BLEND NEEDED NATURAL LOOKING SHADOW LINE, AND ALGAE RESISTANT - ALGAE CLEANING LIMITED WARRANTY PROTECTION. ARCHITECTURAL LAMINATE STYLING PROVIDES A WOOD SHAKE APPEARANCE WITH A 5/8 INCH EXPOSURE. UL 790/108 CLASS A FIRE RATED; ASTM D3161/D3161M-16, TYPE I, CLASS F WIND RESISTANCE; ASTM D7158/D7158M-11, CLASS H WIND RESISTANCE; ASTM D3462/D3462M-10a; ICC-ES AC438; FLORIDA BUILDING CODE APPROVED FL 1956; TEXAS DEPT. OF INSURANCE LISTED; UL EVALUATION REPORTS ER-2919-01 AND ER-2919-02. HERITAGE® LAMINATED FIBERGLASS ASPHALT SHINGLES, BY TAMKO®.
 B. COLOR: AS SELECTED FROM MANUFACTURERS' FULL RANGE OF CLASSIC AND AMERICA'S NATURAL COLORS.
 2. COLOR: RUSTIC SLATE

2.03 HIP & RIDGE SHINGLES

A. 12-1/4" X 12" HIP & RIDGE: DISTINCTIVE SELF-SEALING HIP AND RIDGE SHINGLES COMPLEMENTING THE COLOR OF SELECTED ROOF SHINGLE. EACH BUNDLE COVERS APPROX. 33 LINEAL FEET (9.45 M) WITH A 5/8-INCH (13.02 MM) EXPOSURE. 12-1/4" X 12" HIP & RIDGE SHINGLES BY TAMKO®.

2.04 STARTER STRIP

A. HERITAGE® VINTAGE® STARTER: SELF-SEALING 12-1/2" X 36" STARTER SHINGLES DESIGNED FOR USE WITH HERITAGE® VINTAGE® SHINGLES AND AVAILABLE IN COMPLEMENTING COLORS. EACH BUNDLE COVERS APPROX. 60 LINEAL FEET (18.29 M). HERITAGE® VINTAGE® STARTER BY TAMKO®.
 B. TAMKO® 10 INCH STARTER: SELF-SEALING 10" X 40" STARTER SHINGLE DESIGNED FOR ALL ROOF SHINGLES. EACH BUNDLE COVERS APPROX. 100 LINEAL FEET (30.48 M). TAMKO® 10 INCH STARTER.
 C. TAMKO® SHINGLE STARTER: SELF-SEALING 7" X 36" STARTER SHINGLE DESIGNED FOR ALL ROOF SHINGLES. EACH BUNDLE COVERS APPROX. 102 LINEAL FEET (31.1 M). TAMKO® SHINGLE STARTER.

2.05 SHEET MEMBRANES – EAVES PROTECTION MEMBRANE

A. MOISTURE GUARD PLUS® ICE & RAIN PROTECTIVE UNDERLAYMENT: SELF-ADHERING, FIBERGLASS REINFORCED (WHERE AVAILABLE), RUBBERIZED ASPHALT ICE AND RAIN PROTECTIVE UNDERLAYMENT SURFACED WITH FINE, SKID-RESISTANT GRANULES. CLASSIFIED BY UL, APPROVED BY ICC-ES ESR 1252, FLORIDA BUILDING CODE APPROVED FL 12328. EACH ROLL CONTAINS APPROX. 100 SQ. FT. (9.3 SQ. M.), 39-3/8" X 30'6" (1 M X 9.3 M); 150 SQ. FT. (13.9 SQ. M.), 39-3/8" X 45'8" (1 M X 13.9 M) OR 200 SQ. FT. (18.6 SQ. M.), 39-3/8" X 61" (1 M X 18.6 M). 55 MILS THICK. MOISTURE GUARD PLUS® ICE & RAIN PROTECTIVE UNDERLAYMENT BY TAMKO®.
 B. TW METAL & TILE UNDERLAYMENT: SELF-ADHERING, FIBERGLASS REINFORCED, RUBBERIZED ASPHALT SHEET MEMBRANE SURFACED WITH POLYMER FILM. CLASSIFIED BY UL, APPROVED BY ICC-ES ESR 1252, FLORIDA BUILDING CODE APPROVED FL 3664. EACH ROLL CONTAINS APPROX. 200 SQ. FT. (18.6 SQ. M.), 39-3/8" X 61" (1 M X 18.6 M). 40 MILS THICK. TW UNDERLAYMENT BY TAMKO®.
 C. TW UNDERLAYMENT: SELF-ADHERING, NON-REINFORCED, RUBBERIZED ASPHALT SHEET MEMBRANE SURFACED WITH POLYMER FILM. CLASSIFIED BY UL, APPROVED BY ICC-ES ESR 1252, FLORIDA BUILDING CODE APPROVED FL 3664. EACH ROLL CONTAINS APPROX. 200 SQ. FT. (18.6 SQ. M.), 39-3/8" X 61" (1 M X 18.6 M). 40 MILS THICK. TW UNDERLAYMENT BY TAMKO®.

2.06 SHINGLE UNDERLAYMENTS

A. TAM-SHIELD® SYNTHETIC UNDERLAYMENT: SYNTHETIC, NON-ASPHALTIC, WOVEN, POLYPROPYLENE CONSTRUCTED, NON-BREATHABLE UNDERLAYMENT. LIGHT GREY SURFACE. CLASSIFIED BY UL, APPROVED BY FLORIDA BUILDING CODE APPROVED FL 14864 AND ICC-ES ESR-3237. EACH ROLL CONTAINS APPROXIMATELY 5 SQUARES (500 SQ. FT.) OR 10 SQUARES (1000 SQ. FT.) OF MATERIAL AND IS 48 IN. X 125 FT. (1.21 M X 38.1 M) OR 48 IN. X 250 FT. (1.21 M X 76.2 M), TAM-SHIELD® SYNTHETIC UNDERLAYMENT BY TAMKO®.
 B. SYNTHETIC SHIELD UNDERLAYMENT: SYNTHETIC, NON-ASPHALTIC, WOVEN, NON-BREATHABLE UNDERLAYMENT. BLACK SURFACE. CLASSIFIED BY UL AND APPROVED BY ICC-ES ESR-3237. EACH ROLL CONTAINS APPROXIMATELY 5 SQUARES (50 SQ. FT.) OR 10 SQUARES (1000 SQ. FT.) OF MATERIAL AND IS 48 IN. X 125 FT. (1.21 M X 38.1 M) OR 48 IN. X 250 FT. (1.21 M X 76.2 M), SYNTHETIC SHIELD UNDERLAYMENT BY TAMKO®.
 C. MOISTURE GUARD PLUS® ICE & RAIN PROTECTIVE UNDERLAYMENT: SELF-ADHERING, FIBERGLASS REINFORCED, RUBBERIZED ASPHALT ICE AND RAIN PROTECTIVE UNDERLAYMENT SURFACED WITH FINE, SKID-RESISTANT GRANULES. CLASSIFIED BY UL, APPROVED BY ICC-ES, AND FLORIDA BUILDING CODE APPROVED FL 12328. EACH ROLL CONTAINS APPROX. 100 SQ. FT. (9.3 SQ. M.), 39-3/8" X 30'6" (1 M X 9.3 M); 150 SQ. FT. (13.9 SQ. M.), 39-3/8" X 45'8" (1 M X 13.9 M) OR 200 SQ. FT. (18.6 SQ. M.), 39-3/8" X 61" (1 M X 18.6 M). 55 MILS THICK. MOISTURE GUARD PLUS® ICE & RAIN PROTECTIVE UNDERLAYMENT BY TAMKO®.
 D. TW METAL & TILE UNDERLAYMENT: SELF-ADHERING, FIBERGLASS REINFORCED, RUBBERIZED ASPHALT SHEET MEMBRANE SURFACED WITH POLYMER FILM. CLASSIFIED BY UL, APPROVED BY ICC-ES, AND FLORIDA BUILDING CODE APPROVED FL 1478. EACH ROLL CONTAINS APPROX. 200 SQ. FT. (18.6 SQ. M.), 39-3/8" X 61" (1 M X 18.6 M). 75 MILS THICK. TW METAL & TILE UNDERLAYMENT BY TAMKO®.

E. TW UNDERLAYMENT: SELF-ADHERING, NON-REINFORCED, RUBBERIZED ASPHALT SHEET MEMBRANE SURFACED WITH POLYMER FILM. CLASSIFIED BY UL, APPROVED BY ICC-ES AND FLORIDA BUILDING CODE APPROVED FL 3664. EACH ROLL CONTAINS APPROX. 200 SQ. FT. (18.6 SQ. M.), 39-3/8" X 61" (1 M X 18.6 M). 40 MILS THICK. TW UNDERLAYMENT BY TAMKO®.
 F. TAMKO NO. 15 ASTM D 4869: NO. 15 ASPHALT SATURATED ORGANIC FELT. MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM D-4869 TYPE I, CLASSIFIED BY UL AND IS FLORIDA BUILDING CODE APPROVED. EACH ROLL CONTAINS APPROXIMATELY 4 SQUARES (432 SQ. FT.) OF MATERIAL AND IS 36 IN. X 144 FT. (0.9 M X 43.9 M) TAMKO NO. 15 ASTM D4869 ASPHALT SATURATED ORGANIC FELT BY TAMKO®.
 G. TAMKO NO. 30 ASTM D 4869: NO. 30 ASPHALT SATURATED ORGANIC FELT. MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM D-4869 TYPE I OR III, CLASSIFIED BY UL AND IS FLORIDA BUILDING CODE APPROVED. EACH ROLL CONTAINS APPROXIMATELY 2 SQUARES (216 SQ. FT.) OF MATERIAL AND IS 36 IN. X 72 FT. (0.9 M X 21.9 M) TAMKO NO. 30 ASTM D 4869 ASPHALT SATURATED ORGANIC FELT BY TAMKO®.
 H. TAMKO NO. 15 ASTM: NO. 15 ASPHALT SATURATED NON-PERFORATED, ORGANIC FELT. MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM D-226 TYPE I, CLASSIFIED BY UL AND IS FLORIDA BUILDING CODE APPROVED. EACH ROLL CONTAINS APPROXIMATELY 4 SQUARES (432 SQ. FT.) OF MATERIAL AND IS 36 IN. X 144 FT. (0.9 M X 43.9 M) TAMKO NO. 15 ASTM ASPHALT SATURATED ORGANIC FELT BY TAMKO®.
 I. TAMKO NO. 30 ASTM: NO. 30 ASPHALT SATURATED NON-PERFORATED, ORGANIC FELT. MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM D-226 TYPE II, CLASSIFIED BY UL AND IS FLORIDA BUILDING CODE APPROVED. EACH ROLL CONTAINS APPROXIMATELY 2 SQUARES (216 SQ. FT.) OF MATERIAL AND IS 36 IN. X 72 FT. (0.9 M X 21.9 M) TAMKO NO. 30 ASTM ASPHALT SATURATED ORGANIC FELT BY TAMKO®.
 J. TAMKO NO. 15 UL: NO. 15 ASPHALT SATURATED NON-PERFORATED, ORGANIC FELT. MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM D-226 TYPE I, CLASSIFIED BY UL AND IS FLORIDA BUILDING CODE APPROVED. EACH ROLL CONTAINS APPROXIMATELY 4 SQUARES (432 SQ. FT.) OF MATERIAL AND IS 36 IN. X 144 FT. (0.9 M X 43.9 M) TAMKO NO. 15 ASPHALT SATURATED ORGANIC FELT BY TAMKO®.
 K. TAMKO NO. 30 UL: ASPHALT SATURATED NON-PERFORATED, ORGANIC FELT. MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM D-226 TYPE II, CLASSIFIED BY UL AND IS FLORIDA BUILDING CODE APPROVED. EACH ROLL CONTAINS APPROXIMATELY 2 SQUARES (216 SQ. FT.) OF MATERIAL AND IS 36 IN. X 72 FT. (0.9 M X 21.9 M) TAMKO NO. 30 UL ASPHALT SATURATED ORGANIC FELT BY TAMKO®.
 L. TAMKO NO. 15 ASPHALT SATURATED ORGANIC FELT: CLASSIFIED BY UL, EACH ROLL CONTAINS APPROXIMATELY 4 SQUARES (432 SQ. FT.) OF MATERIAL AND IS 36 IN. X 144 FT. (0.9 M X 43.9 M) TAMKO NO. 15 ASPHALT SATURATED ORGANIC FELT BY TAMKO®.
 M. TAMKO NO. 30 ASPHALT SATURATED ORGANIC FELT: CLASSIFIED BY UL, EACH ROLL CONTAINS APPROXIMATELY 2 SQUARES (216 SQ. FT.) OF MATERIAL AND IS 36 IN. X 72 FT. (0.9 M X 21.9 M) TAMKO NO. 30 ASPHALT SATURATED ORGANIC FELT BY TAMKO®.
 N. TAMKO SUPERX 30 ASPHALT SATURATED NON-PERFORATED FELT: CLASSIFIED BY UL, EACH ROLL CONTAINS APPROXIMATELY 2 SQUARES (216 SQ. FT.) OF MATERIAL AND IS 36 IN. X 72 FT. (0.9 M X 21.9 M) TAMKO SUPERX 30 ASPHALT SATURATED FELT BY TAMKO®.

2.07 ROOFING CEMENTS

A. TAM-PRO SBS FLASHING CEMENTS MEETING THE REQUIREMENTS OF ASTM D4586/D4586M-07(2012)e1, TYPE I.
 B. TAMKO TAM-SEAL ADHESIVE MEETING THE REQUIREMENTS OF ASTM D4586/D4586M-07(2012)e1, TYPE I.
 C. TAM-PRO PLASTIC ROOF CEMENTS MEETING THE REQUIREMENTS OF ASTM D4586/D4586M-07(2012)e1, TYPE I.
 D. TAMKO PLASTIC ROOF CEMENTS MEETING THE REQUIREMENTS OF ASTM D4586/D4586M-07(2012)e1, TYPE I.

2.08 ATTIC VENTILATION

A. RIDGE VENTS
 1. TAMKO® ROLL VENT® CONTINUOUS RIDGE VENT: LIGHTWEIGHT, ROLLED, COMPRESSION RESISTANT SHINGLE OVER RIDGE VENTILATION DESIGNED TO ALLOW THE PASSAGE OF HOT AIR FROM ATTICS, WHILE RESISTING SNOW INFILTRATION. USE IN CONJUNCTION WITH EAVE/SOFFIT VENTILATION PRODUCTS. PROVIDES 18 SQ INCHES NET FREE VENTILATION AREA PER LINEAL FOOT (0.3 SQ.M/M). EACH PACKAGE CONTAINS 20 LINEAL FEET (6.10M) OR 50 LINEAL FEET (15.2 M) OF VENT. HAND NAIL INSTALLATION. ROLL VENT® CONTINUOUS RIDGE VENT BY TAMKO®.
 B. FASCIA AND SOFFIT /UNDER EAVE VENTS: SOFFIT VENTS AS REQUIRED TO PROVIDE BALANCED VENTILATION IN ACCORDANCE WITH TAMKO LOCAL AUTHORITY HAVING JURISDICTION VENTILATION REQUIREMENTS.

1. IN ACCORDANCE WITH VENTILATION REQUIREMENTS TO HELP EVACUATE HOT AIR FROM ATTICS.

2.09 NAILS

A. STANDARD ROUND WIRE, ZINC-COATED STEEL OR ALUMINUM; MIN 12 GAUGE, SMOOTH, BARBED OR DEFORMED SHANK, WITH HEADS 3/8 INCH (9MM) TO 7/16 INCH (11MM) IN DIAMETER. LENGTH MUST BE SUFFICIENT TO PENETRATE INTO SOLID WOOD AT LEAST 3/4 INCH (19MM) OR THROUGH ROOF DECK BY AT LEAST 1/8 INCH (3.18MM).
 B. STANDARD ROUND WIRE, ZINC-COATED STEEL OR ALUMINUM; MIN 12 GAUGE, SMOOTH, BARBED OR DEFORMED SHANK, WITH 1 INCH ROUND PLASTIC CAPS. LENGTH MUST BE SUFFICIENT TO PENETRATE INTO SOLID WOOD AT LEAST 3/4 INCH (19MM) OR THROUGH ROOF DECK BY AT LEAST 1/8 INCH (3.18MM).

2.10 METAL FLASHING

A. 24 GAUGE HOT-DIP GALVANIZED STEEL SHEET, COMPLYING WITH ASTM A653/A653M, G90/Z275.
 B. 16-0275Q, FT. (0.56MM) COPPER SHEET, COMPLYING WITH ASTM B370-15.
 C. 0.032-INCH (0.8MM) ALUMINUM SHEET, COMPLYING WITH ASTM B209-14.

PART III EXECUTION

3.01 EXAMINATION

A. EXAMINE SUBSTRATES, AREAS AND CONDITIONS, WITH INSTALLER PRESENT FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING PERFORMANCE.

1. EXAMINE ROOF SHEATHING TO VERIFY THE SHEATHING JOINTS ARE SUPPORTED BY FRAMING AND BLOCKING OR METAL CLIPS AND THAT INSTALLATION IS WITHIN FLATNESS TOLERANCES.
2. VERIFY THAT THE SUBSTRATE IS DRY, SOUND, CLEAN, SMOOTH, SLOPED FOR DRAINAGE, AND COMPLETELY ANCHORED, AND THAT PROVISION HAS BEEN MADE FOR FLASHINGS AND PENETRATIONS THROUGH ASPHALT SHINGLES.
3. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED AND ROOF DECK HAS BEEN PROPERLY PREPARED.
- C. IF ROOF DECK PREPARATION IS THE RESPONSIBILITY OF ANOTHER INSTALLER, NOTIFY THE ARCHITECT OR BUILDING OWNER OF UNSATISFACTORY PREPARATION BEFORE PROCEEDING.

3.02 PREPARATION

A. CLEAN DECK SURFACES THOROUGHLY PRIOR TO INSTALLATION OF EAVES PROTECTION MEMBRANE AND SHINGLE UNDERLAYMENT.
 B. PATCH AREAS THAT RECEIVE EAVES PROTECTION MEMBRANE, FIBL, KNOTHOLDS AND CRACKS WITH LATEX FILLER.
 C. INSTALL CRICKETS ON THE UPSLOPE SIDE OF ALL CHIMNEYS.

3.03 INSTALLATION OF UNDERLAYMENTS

A. GENERAL:
 1. INSTALL USING METHODS RECOMMENDED BY MANUFACTURER, IN ACCORDANCE WITH LOCAL BUILDING CODES, WHEN LOCAL CODES AND APPLICATION INSTRUCTIONS ARE IN CONFLICT, THE MORE STRINGENT REQUIREMENTS SHALL TAKE PRECEDENCE.
 2. MINIMIZE BREAKAGE OF SHINGLES BY AVOIDING DROPPING BUNDLES ON EDGE, BY SEPARATING SHINGLES CAREFULLY (NOT BY "BREAKING" OVER RIDGE OR BUNDLES), AND BY TAKING EXTRA PRECAUTIONS IN TEMPERATURES BELOW 40 DEGREES F (4.44 DEGREES C).
 3. HANDLE CAREFULLY IN HOT WEATHER TO AVOID SCUFFING THE SURFACING, OR DAMAGING THE SHINGLE EDGES.
 B. PLACEMENT AND NAILING:
 1. SECURE WITH NAILS PER SHINGLE PER TAMKO®S APPLICATION INSTRUCTIONS OR LOCAL CODES.
 2. PLACEMENT OF NAILS VARIES BASED ON THE TYPE OF SHINGLE SPECIFIED. CONSULT THE APPLICATION INSTRUCTIONS FOR THE SPECIFIED SHINGLE FOR DETAILS.
 3. NAILS MUST BE DRIVEN FLUSH WITH THE SHINGLE SURFACE. DO NOT OVERDRIVE OR UNDER DRIVE THE NAIL.
 4. SHINGLE OFFSET VARIES BASED ON THE TYPE OF SHINGLE SPECIFIED. CONSULT THE APPLICATION INSTRUCTIONS FOR THE SPECIFIED SHINGLE FOR DETAILS.
 C. VALLEYS
 1. INSTALL EAVES PROTECTION MEMBRANE AT LEAST 36 (914MM) INCHES WIDE AND CENTERED ON THE VALLEY. LAP ENDS 6 INCHES (152MM) AND SEAL.
 2. WHERE VALLEYS ARE INDICATED TO BE "OPEN VALLEYS", INSTALL METAL FLASHING OVER TILE UNDERLAYMENT AND ANOTHER LAYER OF TILE UNDERLAYMENT OVER THE TOP OF THE EDGES OF THE METAL, IN 6" OVER THE VALLEY FLASHING AND UNDER THE SHINGLES 12". SECURE THE FLASHING BY NAILING AT 18 INCHES (457 MM) ON CENTER JUST BEYOND EDGE OF FLASHING SO THAT NAIL HEADS HOLD DOWN THE EDGE.
 D. HIPS AND RIDGES:
 1. INSTALL TILE UNDERLAYMENT, ALONG ENTIRE LENGTHS, IF RIDGE VENTS ARE TO BE INSTALLED, POSITION TILE UNDERLAYMENT, SO THAT THE RIDGE SLOTS WILL NOT BE COVERED.
 E. ROOF DECK:
 1. INSTALL THE LAYER OF TILE UNDERLAYMENT OVER THE ENTIRE AREA NOT PROTECTED BY ICE AND WATER SHIELD AND AT THE EAVES OR VALLEY. INSTALL SHEETS HORIZONTALLY SO WATER SHEDS AND NAIL IN PLACE.
 2. ON ROOFS SLOPED AT MORE THAN 4:12, LAP HORIZONTAL EDGES AT LEAST 2 INCHES (51MM) AND AT LEAST 2 INCHES (51MM) OVER EAVES PROTECTION MEMBRANE.
 3. ON ROOFS SLOPED BETWEEN 2:12 AND 4:12, LAP HORIZONTAL EDGES AT LEAST 19 INCHES (482 MM) AND AT LEAST 19 INCHES (482MM) OVER EAVES PROTECTION MEMBRANE.
 4. LAP ENDS AT LEAST 4 INCHES (102 MM), STAGGER END LAPS OF EACH LAYER AT LEAST 36 INCHES (914 MM).
 5. LAP ROOFS WITH RUT RIDGE BOARD, MAKE A SLOT 1 INCH (25MM) WIDE, ON EITHER SIDE OF THE PEAK (2 INCH (51MM) OVERALL).
 6. ON ROOFS WITH RIDGE BOARD, MAKE TWO SLOTS 1-3/4 INCHES (44.5MM) WIDE, ONE ON EACH SIDE OF THE PEAK (3 ½ INCH (89MM) OVERALL).
 7. INSTALL RIDGE VENT MATERIAL ALONG THE FULL LENGTH OF THE RIDGE, INCLUDING UN CUT AREAS.
 8. BUTT ENDS OF RIDGE VENT MATERIAL AND JOIN USING ROOFING CEMENT.
 9. INSTALL EAVES VENTS IN SUFFICIENT QUANTITY TO EQUAL OR EXCEED THE RIDGE VENT AREA.
 C. ROOF AND GABLE LOUVERS:
 1. CUT VENT HOLE THROUGH SHEATHING AS SPECIFIED BY THE MANUFACTURER FOR THE TYPE OF VENT TO BE INSTALLED.
 2. ON ROOFTOP APPLICATIONS, INSTALL A 36 INCHES (914MM) SQUARE OF ICE AND WATER SHIELD, CENTERED AROUND THE HOLE.
 3. INSTALL ACCORDING TO MANUFACTURER'S INSTRUCTIONS FOR FLASHING VENT PENETRATIONS
 4. INSTALL EAVE VENTS IN SUFFICIENT QUANTITY TO EQUAL OR EXCEED THE EXHAUST VENT AREA, CALCULATED AS SPECIFIED BY MANUFACTURER
 E. WHOLE HOUSE FANS:
 1. INSTALL AT DESIRED LOCATIONS IN CEILING BELOW ATTIC SPACE PER MANUFACTURER RECOMMENDED LOCATION AND APPLICATION INSTRUCTIONS.

3.04 INSTALLATION OF STARTER SHINGLES

A. GENERAL:
 1. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND LOCAL BUILDING CODES, WHEN LOCAL CODES AND APPLICATION INSTRUCTIONS ARE IN CONFLICT, THE MORE STRINGENT REQUIREMENTS SHALL TAKE PRECEDENCE.
 2. STORAGE AND HANDLING REQUIREMENTS AND RECOMMENDATIONS.
 3. INSTALLATION METHODS.
 B. SHOP DRAWINGS: PROVIDE DETAILED DRAWINGS OF ATYPICAL NON-STANDARD APPLICATIONS OF CEMENTITIOUS SIDING MATERIALS WHICH ARE OUTSIDE THE SCOPE OF THE STANDARD DETAILS AND SPECIFICATIONS PROVIDED BY THE MANUFACTURER.
 C. SELECTION SAMPLES: FOR EACH FINISH PRODUCT SPECIFIED, TWO COMPLETE SETS OF COLOR CHIPS REPRESENTING MANUFACTURER'S FULL RANGE OF AVAILABLE COLORS AND PATTERNS.
 D. VERIFICATION SAMPLES: FOR EACH FINISH PRODUCT SPECIFIED, TWO SAMPLES, MINIMUM SIZE 4 BY 6 INCHES (100 BY 150 MM), REPRESENTING ACTUAL PRODUCT, COLOR, AND PATTERNS.

A. MAINTAIN ENVIRONMENTAL CONDITIONS (TEMPERATURE, HUMIDITY, AND VENTILATION) WITHIN LIMITS RECOMMENDED BY MANUFACTURER FOR OPTIMUM RESULTS. DO NOT INSTALL PRODUCTS UNDER ENVIRONMENTAL CONDITIONS OUTSIDE MANUFACTURER'S ABSOLUTE LIMITS.

1. INSTALL WATER-RESISTIVE BARRIERS AND CLADDINGS TO DRY SURFACES.
 2. REPAIR ANY PUNCTURES OR TEARS IN THE WATER-RESISTIVE BARRIER PRIOR TO THE INSTALLATION OF THE SIDING.
 3. PROTECT SIDING FROM OTHER TRADES.

2.5 PREPARATION

A. CLEAN SURFACES THOROUGHLY PRIOR TO INSTALLATION.
 B. PREPARE SURFACES USING THE METHODS RECOMMENDED BY THE MANUFACTURER FOR ACHIEVING THE BEST RESULT FOR THE SUBSTRATE UNDER THE PROJECT CONDITIONS.
 C. INSTALL A WATER-RESISTIVE BARRIER IS REQUIRED IN ACCORDANCE WITH LOCAL BUILDING CODE REQUIREMENTS.
 D. THE WATER-RESISTIVE BARRIER MUST BE APPROPRIATELY INSTALLED WITH PENETRATION AND JUNCTION FLASHING IN ACCORDANCE WITH LOCAL BUILDING CODE REQUIREMENTS.
2.6 INSTALLATION LAP SIDING
 LAP SIDING:
 A. INSTALL MATERIALS IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
 B. STARTING: INSTALL A MINIMUM 1/4 INCH (6 MM) THICK LATH STARTER STRIP AT THE BOTTOM COURSE OF THE WALL. APPLY PLANKS HORIZONTALLY WITH MINIMUM 1-1/4 INCHES (32 MM) WIDE LAPS AT THE TOP. THE BOTTOM EDGE OF THE FIRST PLANK OVERLAPS THE STARTER STRIP.
 C. ALLOW MINIMUM VERTICAL CLEARANCE BETWEEN THE EDGE OF SIDING AND ANY OTHER MATERIAL IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
 D. ALIGN VERTICAL JOINTS OF THE PLANKS OVER FRAMING MEMBERS.
 E. MAINTAIN CLEARANCE BETWEEN SIDING AND ADJACENT FINISHED GRADE.
 F. LOCATE SPLICES AT LEAST ONE STUD CAVITY AWAY FROM WINDOW AND DOOR OPENINGS.
 G. WIND RESISTANCE: WHERE A SPECIFIED LEVEL OF WIND RESISTANCE IS REQUIRED LAP SIDING IS INSTALLED TO FRAMING MEMBERS AND SECURED WITH FASTENERS DESCRIBED IN TABLE NO. 2 IN NATIONAL EVALUATION SERVICE REPORT NO. NER-405.
 H. LOCATE SPLICES AT LEAST 12 INCHES (305 MM) AWAY FROM WINDOW AND DOOR OPENINGS.

1. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND LOCAL BUILDING CODES, WHEN LOCAL CODES AND APPLICATION INSTRUCTIONS ARE IN CONFLICT, THE MORE STRINGENT REQUIREMENTS SHALL TAKE PRECEDENCE.
2. REFER TO APPLICATION INSTRUCTIONS FOR THE SELECTED STARTER STRIP SHINGLES.
- B. PLACEMENT AND NAILING:
 1. FOR MAXIMUM WIND RESISTANCE ALONG RAKES & EAVES, INSTALL AN STARTER STRIP CONTAINING SEALANT OR CEMENT SHINGLES TO UNDERLAYMENT AND EACH OTHER IN A 4" (102MM) WIDTH OF SBS FLASHING CEMENT, ADHESIVE, OR TAMKO OR TAM-PRO PLASTIC ROOF CEMENT.
 2. PLACE STARTER STRIP SHINGLES 1/4" – 3/4" (6 – 19MM) OVER EAVE AND RAKE EDGES TO PROVIDE DRIP EDGE.
 3. NAIL APPROXIMATELY 1-1/2" – 3" (38 – 76MM) ABOVE THE BUTT EDGE OF THE SHINGLE.
 4. RAKE STARTER COURSE SHOULD OVERLAP EAVE EDGE STARTER STRIP AT LEAST 3" (76MM).

3.05 INSTALLATION OF SHINGLES

A. GENERAL:
 1. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND LOCAL BUILDING CODES, WHEN LOCAL CODES AND APPLICATION INSTRUCTIONS ARE IN CONFLICT, THE MORE STRINGENT REQUIREMENTS SHALL TAKE PRECEDENCE.
 2. MINIMIZE BREAKAGE OF SHINGLES BY AVOIDING DROPPING BUNDLES ON EDGE, BY SEPARATING SHINGLES CAREFULLY (NOT BY "BREAKING" OVER RIDGE OR BUNDLES), AND BY TAKING EXTRA PRECAUTIONS IN TEMPERATURES BELOW 40 DEGREES F (4.44 DEGREES C).
 3. HANDLE CAREFULLY IN HOT WEATHER TO AVOID SCUFFING THE SURFACING, OR DAMAGING THE SHINGLE EDGES.
 B. PLACEMENT AND NAILING:
 1. SECURE WITH NAILS PER SHINGLE PER TAMKO®S APPLICATION INSTRUCTIONS OR LOCAL CODES.
 2. PLACEMENT OF NAILS VARIES BASED ON THE TYPE OF SHINGLE SPECIFIED. CONSULT THE APPLICATION INSTRUCTIONS FOR THE SPECIFIED SHINGLE FOR DETAILS.
 3. NAILS MUST BE DRIVEN FLUSH WITH THE SHINGLE SURFACE. DO NOT OVERDRIVE OR UNDER DRIVE THE NAIL.
 4. SHINGLE OFFSET VARIES BASED ON THE TYPE OF SHINGLE SPECIFIED. CONSULT THE APPLICATION INSTRUCTIONS FOR THE SPECIFIED SHINGLE FOR DETAILS.
 C. VALLEYS
 1. INSTALL VALLEYS USING WOVEN SHINGLE METHOD PER TAMKO®S APPLICATION INSTRUCTIONS.
 A. RUN THE FIRST COURSE OF SHINGLES FROM THE HIGHER ROOF SLOPE ACROSS THE VALLEY AT LEAST 12 INCHES (30 MM).
 B. RUN SUCCEEDING COURSES OF SHINGLES FROM THE LOWER ROOF SLOPE ACROSS THE VALLEY AT LEAST 12 INCHES (305MM) AND NAIL NOT CLOSER THAN 6 INCHES (152MM) TO CENTER OF VALLEY.
 C. TO THE ADJOINING ROOF PLANE, APPLY ONE ROW OF SHINGLES VERTICALLY FACING THE VALLEY AND 2 INCHES BACK FROM THE VALLEY CENTERLINE.
 D. TO COMPLETE THE VALLEY, APPLY SHINGLES ON THE ADJOINING ROOF PLANE BY POSITIONING THE TIP OF THE FIRST SHINGLE OF EACH ROW AT THE 2 INCH POINT FROM THE CENTERLINE WHERE THE EDGE OF THE VERTICAL SHINGLE HAS BEEN APPLIED, COVERING THE VERTICAL SHINGLE.

3.06 INSTALLATION OF ATTIC VENTILATION

A. GENERAL
 1. VENTILATION MUST MEET OR EXCEED CURRENT F.H.I.A., H.U.D. AND LOCAL CODE REQUIREMENTS.
 B. RIDGE / SOFFIT VENTILATION
 1. INSTALL RIDGE VENT ALONG THE ENTIRE LENGTH OF RIDGES:
 2. CUT CONTINUOUS VENT SLOTS THROUGH THE SHEATHING, STOPPING 6 INCHES (152MM) FROM EACH END OF THE RIDGE.
 3. ON ROOFS WITH RUT RIDGE BOARD, MAKE A SLOT 1 INCH (25MM) WIDE, ON EITHER SIDE OF THE PEAK (2 INCH (51MM) OVERALL).
 4. ON ROOFS WITH RIDGE BOARD, MAKE TWO SLOTS 1-3/4 INCHES (44.5MM) WIDE, ONE ON EACH SIDE OF THE PEAK (3 ½ INCH (89MM) OVERALL).
 5. INSTALL RIDGE VENT MATERIAL ALONG THE FULL LENGTH OF THE RIDGE, INCLUDING UN CUT AREAS.
 6. BUTT ENDS OF RIDGE VENT MATERIAL AND JOIN USING ROOFING CEMENT.
 7. INSTALL EAVES VENTS IN SUFFICIENT QUANTITY TO EQUAL OR EXCEED THE RIDGE VENT AREA.
 C. ROOF AND GABLE LOUVERS:
 1. CUT VENT HOLE THROUGH SHEATHING AS SPECIFIED BY THE MANUFACTURER FOR THE TYPE OF VENT TO BE INSTALLED.
 2. ON ROOFTOP APPLICATIONS, INSTALL A 36 INCHES (914MM) SQUARE OF MOISTURE GUARD PLUS OR TW METAL & TILE UNDERLAYMENT, CENTERED AROUND THE HOLE FOR ROOF LOUVERS
 3. INSTALL ACCORDING TO MANUFACTURER'S INSTRUCTIONS FOR FLASHING VENT PENETRATIONS
 4. INSTALL EAVE VENTS IN SUFFICIENT QUANTITY TO EQUAL OR EXCEED THE EXHAUST VENT AREA, CALCULATED AS SPECIFIED BY MANUFACTURER.
 D. SOLAR POWERED VENTILATORS, WHERE OCCUR:
 1. CUT VENT HOLE THROUGH SHEATHING AS SPECIFIED BY THE MANUFACTURER FOR THE TYPE OF VENT TO BE INSTALLED.
 2. ON ROOFTOP APPLICATIONS, INSTALL A 36 INCHES (914MM) SQUARE OF ICE AND WATER SHIELD, CENTERED AROUND THE HOLE.
 3. INSTALL ACCORDING TO MANUFACTURER'S INSTRUCTIONS FOR FLASHING VENT PENETRATIONS
 4. INSTALL EAVE VENTS IN SUFFICIENT QUANTITY TO EQUAL OR EXCEED THE EXHAUST VENT AREA, CALCULATED AS SPECIFIED BY MANUFACTURER
 E. WHOLE HOUSE FANS:
 1. INSTALL AT DESIRED LOCATIONS IN CEILING BELOW ATTIC SPACE PER MANUFACTURER RECOMMENDED LOCATION AND APPLICATION INSTRUCTIONS.

PART 2 PRODUCTS

2.0 MANUFACTURERS

A. ACCEPTABLE MANUFACTURER: JAMES HARDIE BUILDING PRODUCTS, INC., WHICH IS LOCATED AT: 26300 LA ALAMEDA SUITE 400 | MISSION VIEJO, CA 92691; TOLL FREE TEL: 866-274-3464; TEL: 949-367-4980; FAX: 949-367-4981; EMAIL: REQUEST.INFO@JAMESHARDIE.COM; WEB: WWW.JAMESHARDIE.COM
 B. SUBSTITUTIONS: NOT PERMITTED AFTER BIDDING UNLESS PRODUCTS ARE NO LONGER AVAILABLE.

2.1 SIDING

A. LAP SIDING REQUIREMENT FOR MATERIALS:
 1. FIBER-CEMENT SIDING - COMPLIES WITH ASTM C1186-08(2012) TYPE A GRADE II.
 2. ON ROOFTOP APPLICATIONS, INSTALL A 36 INCHES (914MM) SQUARE OF ICE AND WATER SHIELD, CENTERED AROUND THE HOLE.
 3. FIBER-CEMENT SIDING - COMPLIES WITH ASTM E84-15B FLAME SPREAD INDEX = 0, SMOKE DEVELOPED INDEX = 5.
 4. NATIONAL EVALUATION REPORT NO. NER 405 (BOCA, ICBO, SBCCI, IBC, IRC).
 B. LAP SIDING: LAP SIDING WITH A SLOPED TOP, BEVELED DRIP EDGE AND NAILING.
 1. TYPE: SMOOTH 7-1/4 INCHES (184 MM) WITH 6 INCHES (152 MM) EXPOSURE.
2.2 FASTENERS
 A. WOOD FRAMING FASTENERS:
 1. WOOD FRAMING: 4D COMMON CORROSION RESISTANT NAILS.
 2. WOOD FRAMING: 6D COMMON CORROSION RESISTANT NAILS.
 3. WOOD FRAMING: 8D BOX RING COMMON CORROSION RESISTANT NAILS.
 4. WOOD FRAMING: 0.093 INCH (2.4 MM) SHANK BY 0.222 INCH (5.6 MM) HEAD BY 2 INCHES (51 MM) CORROSION RESISTANT SIDING NAILS.
 2.3 FINISHES

3.07 PROTECTION

A. PROTECT INSTALLED PRODUCTS FROM FOOT TRAFFIC UNTIL COMPLETION OF THE PROJECT.
 B. ANY ROOF AREAS THAT ARE NOT COMPLETED BY THE END OF THE WORKDAY ARE TO BE PROTECTED FROM MOISTURE AND CONTAMINANTS.

END OF SECTION

SECTION 07 46 46 – FIBER CEMENT SIDING

THIS SECTION IS BASED ON THE PRODUCTS OF JAMES HARDIE BUILDING PRODUCTS, INC PART 1 GENERAL

1.1 SECTION INCLUDES

A. FIBER CEMENT LAP SIDING, PANELS, SHINGLE, TRIM, FASCIA, MOULDING AND ACCESSORIES;
 B. FACTORY-FINISHED FIBER CEMENT LAP SIDING, PANELS, SHINGLE, TRIM, FASCIA, MOULDING AND ACCESSORIES.

1.2 REFERENCES

A. ASTM C1186-08(2012) - STANDARD SPECIFICATION FOR FLAT FIBER-CEMENT SHEETS
 B. ASTM D3359-09e2 - STANDARD TEST METHOD FOR MEASURING ADHESION BY TAPE TEST, TOOL AND TAPE.
 C. ASTM E136-12 - STANDARD TEST METHOD FOR BEHAVIOR OF MATERIALS IN A VERTICAL TUBE FURNACE AT 750 DEGREES C.

1.3 SUBMITTALS

A. PRODUCT DATA: MANUFACTURER'S DATA SHEETS ON EACH PRODUCT TO BE USED, INCLUDING:
 1. PREPARATION INSTRUCTIONS AND RECOMMENDATIONS.
 2. STORAGE AND HANDLING REQUIREMENTS AND RECOMMENDATIONS.
 3. INSTALLATION METHODS.
 B. SHOP DRAWINGS: PROVIDE DETAILED DRAWINGS OF ATYPICAL NON-STANDARD APPLICATIONS OF CEMENTITIOUS SIDING MATERIALS WHICH ARE OUTSIDE THE SCOPE OF THE STANDARD DETAILS AND SPECIFICATIONS PROVIDED BY THE MANUFACTURER.
 C. SELECTION SAMPLES: FOR EACH FINISH PRODUCT SPECIFIED, TWO COMPLETE SETS OF COLOR CHIPS REPRESENTING MANUFACTURER'S FULL RANGE OF AVAILABLE COLORS AND PATTERNS.
 D. VERIFICATION SAMPLES: FOR EACH FINISH PRODUCT SPECIFIED, TWO SAMPLES, MINIMUM SIZE 4 BY 6 INCHES (100 BY 150 MM), REPRESENTING ACTUAL PRODUCT, COLOR, AND PATTERNS.

1.4 QUALITY ASSURANCE

A. INSTALLER QUALIFICATIONS: MINIMUM OF 2 YEARS EXPERIENCE WITH INSTALLATION OF SIMILAR PRODUCTS.

1.5 DELIVERY, STORAGE, AND HANDLING

A. STORE PRODUCTS IN MANUFACTURER'S UNOPENED PACKAGING UNTIL READY FOR INSTALLATION.
 B. STORE SIDING ON EDGE OR LAY FLAT ON A SMOOTH LEVEL SURFACE. PROTECT EDGES AND CORNERS FROM CHIPPING. STORE SHEETS UNDER COVER AND KEEP DRY PRIOR TO INSTALLING.
 C. STORE AND DISPOSE OF SOLVENT-BASED MATERIALS, AND MATERIALS USED WITH SOLVENT-BASED MATERIALS, IN ACCORDANCE WITH REQUIREMENTS OF LOCAL AUTHORITIES