FORM F.1: VALUE ADDED OPTIONS
PART B – SPECIFICATIONS

415 Value Add - Roofing Specifications

416 Route Existing Cracks in Concrete or Masonry

416.1 Remove defective concrete, honeycombs, cavities, joint cracks, voids and other defects by routing to sound material.

417 Prepare Concrete by Shot Blasting.

417.1 Clean masonry surface and roughen smooth surfaces by mechanical abrasion.

417.2 Remove surface laitance and abrade surface in accordance with coating manufacturer's specifications.

418 Vertical Application of Water Dispersed VOC Compliant Silane Sealer

418.1 Prepare the wall surface to ensure all dust and debris are removed prior to sealer application. Follow Manufactures requirements

418.2 Fill cracks with polyurethane sealant and tool neatly to ensure 100% adhesion takes place. Allow sealant time to cure prior to coating application.

418.3 Apply sealer from bottom to the top in one application until saturation occurs. The solution shall be uniformly sprayed to saturate/ flood the surface. Coverage rates will vary for different substrates.

418.4 Spray apply sealer to concrete surface with metered spray equipment and back pack provided by manufacturer. Follow manufacturer's detailed application requirements and coverage rates.

418.5 Water test the treated surface after sealer has dried to assure proper application. Allow for at least 24 hours after completing application before water test.

419 Horizontal Application of Water Dispersed VOC Compliant Silane Sealer

419.1 Prepare the wall surface to ensure all dust and debris are removed prior to sealer application. Follow Manufactures requirements

419.2 Fill cracks with polyurethane sealant and tool neatly to ensure 100% adhesion takes place. Allow sealant time to cure prior to coating application.

419.3 Apply sealer in one application until saturation occurs. The solution shall be uniformly sprayed to saturate/ flood the surface. Broom out all puddle areas. Coverage rates will vary for different substrates.

419.4 Spray apply sealer to concrete surface with metered spray equipment and back pack provided by manufacturer. Follow manufacturer's detailed application requirements and coverage rates.

419.5 Spot water test the treated surface after sealer has dried to assure proper application. Allow for at least 24 hours after completing application before water test. The number of required water tests to be determined at the pre-job walk.

420 Roof Cleaning System

420.1 Pretreat membrane and flashings when recommended by cleaning equipment manufacturer based upon site assessment of membrane condition.

420.2 Heat water to 120 degrees and infuse with detergent free cleaning solution utilizing rotating wash head equipment operated at not less than 2,000 psi. and 2,500 RPM.

420.3 Apply heated cleaning solution onto membrane and flashing surfaces.

420.4 Power wash membrane and flashings using equipment and methods recommended in writing by cleaning equipment manufacturer for specific application.

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420.5 Collect cleaning water, associated cleaning compounds, any residual material and process to meet US EPA and local environmental requirements for legal discharge

421 Roof deck insulation, fiberboard in 4ft x 4ft sheets, 1/2" thick, R-1.39

422 Cold applications: adhere insulation to primed deck or sub-insulation with a cold adhesive at a rate of 1.5 gallons per 100 square feet.

422.1 Refer to manufacturer's Product Data sheet for detailed material and application requirements.

423 Installation of New Polyisocyanurate insulation.

423.1 Install 4ft by 4ft or 4ft by 8ft tapered or flat polyisocyanurate roof insulation over roof decking. Insulation thickness, size and slope as required by project Scope of Work and installed on a per board foot cost.

423.2 Isocyanurate, HH-I-1972/GEN and HH-I-1972/2 Fire Approval, Class I and/or labeled with UL/FM labels.

423.3 Provide factory-tapered insulation boards fabricated to slope of 1/8-inch rise per 12 inch run, 1/4-inch rise per 12 inch run or 1/2-inch rise per 12 inch run.

423.4 Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards.

423.5 Stagger insulation board joints a minimum of 12 inches in both directions from joints of the previous insulation layer.

423.6 Insulation must meet UL and FM requirements and must not have over 1/4" joints between boards.

423.7 Joints must be staggered a minimum of 12".

423.8 Workmanship must be superior and comply with NRCA, FM, UL and roofing material manufacturer's guidelines and specifications.

423.9 Measurement will be calculated in board feet.

424 Mechanically Attached Insulation.

424.1 Install and secure insulation to deck using mechanical fasteners specifically designed and sized for fastening specified roof insulation board to deck type. Insulation fastener density to meet FM 1-90 insulation attachment standards and roofing manufacturer's requirements.

424.2 Fasteners with 3" galvanized metal plates.

424.3 Provide equipment, materials, tools and experienced labor to install rigid roof insulation. Attach the insulation to the substrate with approved fastening methods.

424.4 Mechanically attached: mechanically join single layer insulation to deck with approved fastener minimum of one (1) every 2 square feet. Install additional fasteners to ensure insulation is firmly affixed, especially at parapets and at perimeters, as required per FM I-90 insulation attachment standards (depending on deck location and height).

424.5 Fasteners are to be flush with top surface of insulation.

424.6 Filler insulation requires two (2) fasteners per piece.

424.7 Form continuous insulation joints over deck flange. Do not cantilever insulation edges over deck ribs, minimum bearing surface 1 1/2" and doesn't exceed 35 psi in accordance with ASTM C 165. Attachment and flute span will be in accordance with insulation board manufacturer's specifications and comply with UL, Class A and FM I-90 attachment standards.

424.8 Install fasteners perpendicular to deck.

424.9 Drive mechanical fasteners flush to top surface.

424.10 Install additional fasteners to ensure insulation is firm under foot.

424.11 Round up to the next whole number of fasteners when necessary.

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425 Hot Adhered Insulation.

425.1 Adhere insulation to substrate using continuous mopping of hot asphalt at an approximate rate of 30 lbs. per 100 square feet at EVT. Hot asphalt adhesive shall meet or exceed ASTM D 312-95a performance requirements.

425.2 Asphalt type to be determined by project requirements. Installation to meet FM 1-90 insulation attachment standards and roofing manufacturer's requirements.

425.3 Immediately after placement, walk insulation boards into adhesive to achieve solid contact.

426 Cold Adhered Insulation.

426.1 Adhere insulation to substrate using solvent free urethane insulation adhesive. Install insulation using one-part asphaltic urethane adhesive or two-part low rise foam elastomeric urethane adhesive.

426.2 Cold insulation adhesive is for places where the deck is exposed on underside or where hot adhesive or mechanical attachment is not desirable.

426.3 Clean and prime substrate as required. When needed prime surface to receive adhesive with manufacturer's recommended asphalt-based primer. Allow primer to dry.

426.4 Install base sheet or insulation per manufacturer's printed directions, as needed.

426.5 Adhesives for polyisocyanurate insulating boards.

426.6 Asphaltic Urethane Adhesive: Nominal 100% solid, moisture curing, one-part asphaltic urethane adhesive for use in adhering insulation. Shall pass the Cold Brittleness of ASTM D 816- 92 at -60 degrees Fahrenheit.

426.7 Asphaltic Urethane Adhesive Application: Apply adhesive at manufacture's rate for application of adhesive, with each bead measuring 1/2 to 3/4 inch in diameter. Increase coverage rate of adhesive in perimeter and corner areas as required per specifications.

426.8 Low Rise Foam Adhesive: Two component (1:1 ratio), solvent free, elastomeric urethane adhesive. Asbestos free, extremely low in odor, and does not contain any bitumen or VOC's. Shall pass the Flexibility test of ASTM D 816 at 70 degrees Fahrenheit.

426.9 Low Rise Foam Adhesive Application: Apply adhesive in accordance with specifications and details by manufacturer. Apply insulation adhesive using a manufacturer's approved battery powered applicator or low pressure adhesive pump designed to dispense two component 1:1 ratio low viscosity adhesives.

426.10 Adhesive Application using Low Pressure Pump System

426.11 Apply 1/2 to 3/4 inch wide adhesive beads to the substrate or insulation board in straight ribbons spaced a maximum of 12 inches on center (spacing may need to be decreased depending on wind uplift requirements). **Do not apply** adhesive ribbons in serpentine pattern.

426.12 Once adhesive begins to rise install insulation boards. Do not allow adhesive to skin over before placing the boards.

426.13 Walk on boards to fully press them into the wet adhesive. Adhesive will lock boards down in approximately 5 to 7 minutes.

426.14 Adhesive Application using Battery Powered Single Bead Applicator

426.15 Install the cartridge into the battery powered or pneumatic single bead applicator. Refer to applicator data sheet for complete operating instructions.

426.16 Apply 1/4"-1/2" wide adhesive beads to the substrate or insulation board in straight ribbons spaced a maximum of 12 inches on center (spacing may need to be decreased depending on wind uplift requirements). Do not apply adhesive ribbons in serpentine pattern.

426.17 Install insulation boards immediately into the wet adhesive. Do not allow adhesive beads to skin over before placing the boards.

426.18 Walk on boards to fully press them into the wet adhesive. Adhesive will lock boards down in approximately 5 to 7 minutes.

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426.19 Decrease field-of-the-roof adhesive spacing between ribbons (rows) in perimeters and corners as defined in FM Loss Prevention Data Sheet 1-29.

426.20 Refer to manufacturer's Product Data sheet for detailed material and application requirements.

427 Ridge Vents

427.1 Install new continuous concealed rigid plastic ridge vents with asphalt shingle caps.

427.2 Install venting along ridges and/or hips to prevent entrapment of moisture-laden air behind roof sheathing and prevent mold growth and ice dams.

427.3 Install only one type of exhaust vent, remove or plug any existing vents (gable vents, roof louvers, wind turbines and power fans).

427.4 When specified, install adequate intake ventilation for a balanced system (50% Exhaust & 50% Intake) in accordance with state and local code requirements. Intake vents must be installed low at the roof's edge for optimum performance.

427.5 Cut (opening) in roof decking (Per the manufacturers requirements) along ridge or hip (plumb cut, if possible). Adjust depth of blade to avoid cutting rafters or trusses. See manufacturer's instructions for cutting slot and slot dimensions. Remove debris from slot.

427.6 When using architectural shingles, seal the gap between the vent and shingles making sure not to plug drain holes. Caulk is not needed with 3-tab shingles.

427.7 Make sure the filter, if supplied is centered in the ridge vent and make sure it is secured between shingles and vent prior to cap nailing, leaving no gaps.

427.8 When installing the ridge vent in cold weather, leave a 1/8" gap between ridge vent ends to allow for expansion in hot weather or as recommended by manufacturer.

427.9 Run the ridge vent from end to end on the roof.

427.10 Carefully place the ridge vent prior to cap shingle nailing with the preformed nail holes provided in the vent.

427.11 Pre-fasten first section using roofing nails through preformed nail bosses. Continue to pre-fasten remaining sections, making sure support ribs are flat on the roof and filter is secure between shingles and vent.

427.12 Over-nailing will cause the vent to buckle. Under-nailing could allow the nails to back out of the deck.

427.13 All nails must penetrate the underside of the roof deck. Verify adequate nail length prior to installation.

428 Synthetic Underlayment

428.1 Install high-strength, woven fabric based, water resistant roof underlayment sheet for use in steep slope roof covering systems.

428.2 Underlayment sheet shall comply with ASTM D6757, and manufactured to meet performance requirements of ASTM D226, ASTM D4869 and Classified by UL to be a suitable underlayment for use in any UL Class A fire-rated shingle system.

428.3 Install synthetic underlayment felts over roof decking prior to shingle application.

428.4 Install membrane directly to clean roof deck surface per manufacturer's instruction.

428.4.1 Cover roof deck with underlayment felt installed without wrinkles. Use only enough nails to hold underlayment in place until covered by shingles.

428.4.2 Starting at low point install perpendicular to slope overlapping each succeeding course 2 inches minimum and side laps 4 inches minimum. Along eaves apply underlayment on top of metal drip edge. Along rake edges install underlayment under metal drip edge.

428.4.3 Overlap starter strips 20 inches with first ply, and then overlap each succeeding ply 19 inches. Place ply sheets to ensure water will flow over or parallel to, but never against exposed edges.

428.4.4 Use 18 and 36-inch wide plies to start and finish roof membrane along roof edges and terminations.

428.4.5 Run felt over valley ice and water protection membrane at least 18 inches each way. Overlap ice and water protection membrane 12 inches at eaves.

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428.4.6 Attach felt courses using minimum 1 inch galvanized roofing nails or cap nails per specifications.
428.4.7 Turn felt up vertical surfaces a minimum 4 inches. Overlap onto curb and penetration ice and water guard membrane.
428.5 Install one (1) layer of roofing underlayment felt over roof decking on slopes with 4-inch rise in 12-inch run or greater.
428.5.1 Install membrane directly to clean roof deck surface per manufacturer's instruction and as specified.
428.5.2 Cover roof deck with underlayment felt installed without wrinkles. Use only enough nails to hold underlayment in place until covered by shingles.
428.5.3 Starting at low point install perpendicular to slope overlapping each succeeding course 2 inches minimum and side laps 4 inches minimum. Along eaves apply underlayment on top of metal drip edge. Along rake edges install underlayment under metal drip edge.
428.5.4 Run felt over valley ice and water protection membrane at least 18 inches each way. Overlap ice and water protection membrane 12 inches at eaves.
428.5.5 Attach felt courses using minimum 1 inch galvanized roofing nails or cap nails per specifications.
428.5.6 Turn felt up vertical surfaces a minimum 4 inches. Overlap onto curb and penetration ice and water guard membrane.

429 Shingles, Fiberglass, Class A, 40-Year, Premium Laminated Multilayered Shingles, Slopes 3:12 or Greater

429.1 Fiberglass singles shall meet or exceed ASTM D 3018, Type I, carry UL, Class A and wind uplift labels, have hip and ridge factory pre-cut (where applicable). Nails are to be hot galvanized, 11 or 12 gauge, barb shank, 3/8" heads, sharp pointed and of sufficient length to penetrate at least 3/4" into decking. Use six nails per single; staples are not permitted.
429.2 Customer picks color.
429.3 Bituminous plastic cement shall meet or exceed Federal Specifications SS-C-153C, Type I, Class A, and shall be asbestos free.
429.4 On slopes of 4:12 or greater, underlayment shall be as recommended by shingle manufacturer, and carry UL labels.
429.5 Inspect deck after old roof removal and repair any minor defects.
429.6 Install base felts and valley felts.
429.7 Install shingles per manufacturer's specifications.
429.8 On slopes 3:12 but less than 4:12, follow the installation guidelines from the shingle manufacturer. Should a double layer of underlayment be required prior to application of shingles. [Unit price includes one layer of underlayment. If a second layer is required, it will be treated as a separate line item. A single layer of a coated organic base sheet may be installed in lieu of 15-lb. felt, when required.]
429.9 In high snow areas, use two each 30 lb. asphalt felts in lieu of 15 lb. felts or manufacturer's approved synthetic underlayment.
429.10 Eave metal shall be 2" x 2", 26 gauge galvanized, unpainted.
429.11 In high wind areas, use 3" x 2" 24 gauge galvanized, unpainted eave metal.
429.12 In ice and snow country, install ice and water shield upslope to a point two feet beyond inside wall line at eaves, or as required by local code if it is more stringent.
429.13 Warranty is to be prorated, labor and materials, for the length of the warranty period.

430 Shingles, Fiberglass, Class A, 50-Year, Premium Laminated Multilayered Shingles, Slopes 3:12 or Greater

430.1 Fiberglass singles shall meet or exceed ASTM D 3018, Type I, carry UL, Class A and wind uplift labels, have hip and ridge factory pre-cut (where applicable). Nails are to be hot galvanized, 11 or 12 gauge, barb shank, 3/8" heads, sharp pointed and of sufficient length to penetrate at least 3/4" into decking. Use six nails per single; staples are not permitted.

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430.2 Customer picks color.

430.3 Bituminous plastic cement shall meet or exceed Federal Specifications SS-C-153C, Type I, Class A, and shall be asbestos free.

430.4 On slopes of 4:12 or greater, underlayment shall be as recommended by shingle manufacturer, and carry UL labels.

430.5 Inspect deck after old roof removal and repair any minor defects.

430.6 Install base felts and valley felts.

430.7 Install shingles per manufacturer's specifications.

430.8 On slopes 3:12 but less than 4:12, follow the installation guidelines from the shingle manufacturer. Should a double layer of underlayment be required prior to application of shingles. [Unit price includes one layer of underlayment. If a second layer is required, it will be treated as a separate line item. A single layer of a coated organic base sheet may be installed in lieu of 15-lb. felt, when required.]

430.9 In high snow areas, use two each 30 lb. asphalt felts in lieu of 15 lb. felts or manufacturer's approved synthetic underlayment.

430.10 Eave metal shall be 2" x 2", 26 gauge galvanized, unpainted.

430.11 In high wind areas, use 3" x 2" 24 gauge galvanized, unpainted eave metal.

430.12 In ice and snow country, install ice and water shield upslope to a point two feet beyond inside wall line at eaves, or as required by local code if it is more stringent.

430.13 Warranty is to be prorated, labor and materials, for the length of the warranty period.

431 Install Layer of 30 lb. Felt

431.1 Follow Felt Manufacture written specifications for installation. Felt shall be applied to a properly prepared dry deck that is smooth, clean, and free from any depressions, projections, or protruding nails. Roof decks shall be structurally sound and meet, or exceed, minimum requirements of the deck manufacturer and local codes.

431.2 Nails are to be hot dipped galvanized 11 or 12-gauge barb shank with 3/8" heads, sharp pointed and long enough to penetrate and grasp 3/4" or 1". Capped Simplex or Maze nails or approved equals may be used.

431.3 Always lay the 30lb felt parallel to the eaves, lapping each course at least 2" over the underlying course. Apply the drip edge underneath and along the eaves and over the rakes.

431.4 Never applied perpendicular to the eaves. Secure the 30 lb felt with cap fasteners every 12" across the lower and upper edge to hold it in place. If more than one piece is required to continue a course, lap the ends at least 4". End laps in succeeding courses should be located at least 6ft from end laps in the preceding course. Lap the 30lb felt a minimum of 6" from both sides over all hips, ridges and valleys.

431.5 Where a roof meets a vertical surface, carry the underlayment at least 4" up the vertical surface. On decks having a slope greater than 4" per foot, one layer of 30lb felt should be applied. Some local codes may require specific underlayment's on slopes 2" to 4" per foot. Apply a double layer of 30lb felt over the entire deck surface. Starting with a 19" wide strip at eaves, overhanging the eaves 1/4" to 3/8", cover with full 36" strips providing a 17" exposure. Continue with 36" strips lapping each course 19" over the preceding course. End laps for low slopes shall be 12" and staggered 6ft apart.

431.6 Always and observe safe roofing practices according to OSHA and local building code requirements. Always use caution when walking on sloped roof decks and underlayment. Do not walk on unsecured or any other loose roofing material lying on sloped roof decks. Dust, dew, water, or debris creates unsafe conditions on the roof. The presence of any foreign matter may drastically change the coefficient of friction (traction) on the 30lb felt and any other material on a sloped roof deck. Failure to always use proper safety equipment and footwear can result in serious injury or even death.

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432 TPO 60 mil System Installation

432.1 60 mil white elastomeric single ply sheeting comprised of an elastomeric thermoplastic polyolefin and reinforced with a high strength, wick resistant polyester fabric. TPO Roof Membrane is asbestos free and exceeds the performance requirements of ASTM D 6754-02.

432.2 Install thermoplastic roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Thermoplastic Roofing"

432.3 Heat weld seams according to manufacturer's specifications.

432.4 Provide mechanical attachment of roof membrane at roof perimeter, walls, expansion joints, and all other projections. Follow recommendations of Factory Mutual Loss Prevention Data Sheets 1-28, 1-29, and 1-49.

433 Bonding Adhesive.

433.1 The membrane shall be fully adhered to properly installed and prepared substrate surface. The surface shall be clean, dry, smooth, and free from contamination.

433.2 Install membrane using approved Bonding Adhesive and applied.

433.3 Apply adhesive at the manufacturer published application guidelines. The coverage rate will vary depending on the porosity of the substrate surface.

433.4 Bonding adhesive shall not be applied to lap (seam) areas that are to be welded to flashings or adjacent membrane sheets by means of hot air welding procedures. If contamination occurs, remove any contaminates prior to hot air welding seams.

433.5 Roll the membrane, using a 75# membrane roller or equivalent, into the adhesive to remove wrinkles and assure positive contact with the substrate.

434 Mechanically Attached

434.1 The single membrane shall be mechanically attached to properly installed and prepared substrate surface. The surface shall be clean, dry, smooth, and free from contamination.

434.2 Unroll the membrane and allow relaxing as long as possible (Minimum 1/2 - 1 hour).

434.3 Position roll of sheeting in a manner, which provides sufficient material to facilitate flashing. The roofing membrane shall be unrolled and positioned square with to the roof edge. Laps shall be shingled with, or run parallel to, the slope of the roof. Overlap side laps minimum 4-1/2 inches and end laps minimum three (3) inches. Install succeeding rolls in same manner. Avoid wrinkles. Reposition sheet when necessary. Do not stretch material unevenly.

434.4 Mechanically attach single ply perimeter and field sheets along edge of underlying ply lap. Fasten membrane through insulation and in to roof deck with specified heavy duty fasteners and specified barbed membrane plates spaced a minimum of 12 inches on center down the entire lap with plate centered 1-1/8" from sheet edge. Mechanical fasteners shall be installed in true and straight rows and columns.

434.5 In-Seam Attachment: Secure one edge of roofing membrane using fastening plates centered within membrane seam and mechanically fasten roofing membrane to roof deck.

434.6 Through-Membrane Attachment: Secure roofing membrane using fastening plates and mechanically fasten roofing membrane to roof deck. Cover fasteners with a continuous cover strip.

434.7 Seal all seams with automatic or hand welder.

434.8 Install perimeter sheets.

434.9 Unroll the membrane and allow to relax as long as possible. (Minimum 1/2 - 1 hour)

434.10 Begin membrane installation at low point of deck. Allow sheet to overhang roof edge a minimum of 1-1/2 inches below lower edge of wood nailer.

434.11 Install a minimum of two (2) perimeter sheets. Mechanically attach sheets a minimum of 12 inches on center down entire lap and around penetrations and roof projections. for actual perimeter half sheet requirements. Determine the perimeter width as described in Section 2.2 of Factory Mutual Loss Prevention Data Sheet 1-28.

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434.12 Install the required number of half-width perimeter rolls along the roof edges both parallel and perpendicular to the roll direction in the field of the roof. Overlap perimeter sheets in the corner areas with perimeter fastener rows installed through both membranes in both directions. Install minimum 6 inch wide reinforced cover strip centered over the fastener rows. Heat weld cover strip to field membrane.

434.13 Install succeeding field sheet rolls.

434.14 Unroll the membrane and allow to relax as long as possible. (Minimum 1/2 - 1 hour)

434.15 Position field sheets square with to the roof edge. Overlap upper edge of perimeter sheets 4-1/2 inches.

434.16 Cut membrane to fit neatly around all penetrations and roof projections.

434.17 Mechanically attach sheets 12 inches on center down entire lap and around penetrations and roof projections.

434.18 Perimeter/Projection Attachment

434.19 Mechanically attach roofing membrane at roof perimeters, curbs, and pipe/stack penetrations greater than 12" in diameter, on both sides of expansion joints and other areas where the membrane must be anchored to prevent movement, stress or damage to the roofing membrane.

434.20 Provide mechanical attachment at deck angle changes in excess of 2"/12" (including drain sump areas).

434.21 Membrane Seaming

434.22 Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.

434.23 Using an approved automatic heat welding machine or hand held heat gun and steel roller, continuously weld a minimum 1 1/2" wide seam. Minimum width of welded lap shall be 1-1/2 inch when using an automatic welder. Hand welds shall be a minimum of 2-inches wide. Only approved Automatic Walker Welders shall be used to weld seams.

434.24 Field test heat welded seams to assure proper construction. Perform field test after lap area cools to ambient temperatures. Properly constructed laps will not separate at the lap interface when tested.

434.25 If probing T-joint areas reveal the presence of voids or cold welds on membrane, install a 4" round field cut of flashing membrane (unreinforced) to the formed T-joint.

434.26 Repair tears, voids, and lapped seams in roofing membrane.

435 Wet Vacuum Loose Aggregate from Roof Membrane

435.1 Remove existing loose aggregate from roof surface by wet vacuuming to accommodate the new roof system application. Remove loose aggregate from jobsite.

435.2 Clean roof areas of loose aggregate, dirt and dust by wet vacuuming. Re-vacuum as needed. Embedded aggregate may remain.

435.3 When applicable, take precautions as needed to ensure existing moisture survey scan paint lines outlining wet roof areas are transferred to the cleaned roof surface.

435.4 Provide and install adequate temporary support of all electric and gas supply lines during work.

435.5 Take precautions needed to prevent damage or breakage of lines/piping while lifting or moving them.

435.6 Take precautions as needed to prevent debris from entering the roof drainage system.

436 Sweep loose aggregate, debris from Substrate

436.1 Sweep substrate to remove all existing loose aggregate and debris. Remove loose aggregate and debris from Job Site

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437 Prime Substrate

437.1 Prime prepared surfaces using manufacturer's approved primer according to manufacturer's specifications.

437.2 Clean substrate of dust, debris, and other substances detrimental to coating installation according to the coating system manufacturer's written instructions.

437.3 Once cleaning and preparation work is complete, apply primer to the surface at rate specified by coating manufacturer. Re-prime areas that become wet.

438 Flashing Membrane, Base Ply and 1 Ply Modified Bitumen Fire Rated

438.1 Install UL 790, Class A flashing membrane system consisting of one base ply sheet and a fire rated modified bitumen flashing cap ply sheet. Install flashing system in manufacturer's approved adhesive and using specified application methods.

438.2 Flashing cap ply sheet shall consist of a granule surfaced weathering membrane with fire resistant characteristics. Consisting of specially selected bitumens, modified with compatible SBS elastomers and is surfaced with an embedded layer of factory applied granules. Install cap sheet in hot asphalt or cold adhesive as specified.

438.3 Ensure complete and continuous seal and contact between adhesive and felts, without wrinkles, fish mouths or blisters.

438.4 Replace all sheets that are not fully bonded by ply adhesive.

439 Disaster Response Repairs

439.1 Perform emergency temporary or permanent remedial repairs to resolve reported emergency conditions/discrepancies and bring roof back to a watertight condition.

440 Built Up Roof Surface w/ Cold Process White Highly Reflective Adhesive and White Marble Gravel.

440.1 Install a highly reflective white marble roof surfacing system over an installed UL 790, Class A built-up or modified bitumen roofing system.

440.2 The white roofing aggregate surfacing system is Highly Reflective.

440.2.1 Roof surfacing system as Recommended Gravel Tremco/A-1 Grit Snow White Marble Roofing Aggregate • Tremco #1 White Marble or approved Roofing Aggregate by manufacturer, adhered in highly reflective, asbestos-free, polymeric low volatile surfacing adhesive.

440.3 Prior to application of surface treatment system, inspect roof with project superintendent.

440.4 Prepare roof surface for surfacing application.

440.4.1 Cold process roof system and fresh applications of mastic require a minimum 30-day cure period prior to surfacing application.

440.4.2 Remove dirt, dust and loose debris from roof. Roof surface to be coated shall be clean, sound and dry.

440.5 Apply Surfacing.

440.5.1 Fully mix the adhesive prior to application. Review the product data or label information for proper mixing instructions. Adhesive must be heated during spray application by using an oil jacketed heat exchange unit. The recommended output material temperature range is 95 degrees Fahrenheit to 115 degrees Fahrenheit.

440.5.2 Over entire roof surface, spray-apply uniform and continuous flood coat of Rock-It Aggregate Surfacing Adhesive at a minimum rate of 5-gallons per 100 square feet.

440.5.3 Immediately broadcast minimum 200 lbs. per 100 square feet of new, clean white marble roofing aggregate.

441 Two Component, High Performance, One Part Moisture Triggered, Polyurethane Coating System with Fiberglass or Polyester Reinforcement

441.1 Prior to application the surface must be clean, dry, solid, and free of dirt, grease, oil, algae, and other debris. If the bio-based coating is being used over an existing roof system, all appropriate

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repairs should be made before applying the bio-based system. Allow suggested cure time of repairs before applying the bio-based coating to the roof surface.

441.2 Prime coating substrates using approved primer as recommended by manufacturer for application.

441.3 Coverage Rate: Base coating shall be applied to roof and flashing surfaces at a rate of 3-4 gallons per 100 sq. ft. to achieve 48 - 64 mils wet film thickness or as recommended by manufacturer for application.

441.4 Mixing: Use a heavy duty power drill with Jiffy Mixer attachment. Cordless drills are not recommended and may not properly mix the materials. Mix Part A for 1 minute before adding Part B. After adding Part B mix the combined materials for a minimum of 2 minutes moving the mix blade from top to bottom. Review manufacturer written specifications for complete application requirements.

441.5 The base coat requires full reinforcement with fiberglass mat or polyester mat. Fully embed reinforcement into wet coating using a brush or roller until free of voids, wrinkles, air pockets, standing fibers, etc.

441.6 Top Coat is a one part moisture triggered, polyurethane coating, polyurethane roof coating.

441.7 The previously applied bio-based base coat must be clean, dry, solid, and free of dirt, grease, oil, algae, and other debris. The base coat should be top-coated within 72 hours of base coat application.

441.8 Mixing: Use a heavy duty power drill with Jiffy Mixer attachment. Cordless drills are not recommended and may not properly mix the materials. Mix Part A for 1 minute before adding Part B. After adding Part B mix the combined materials for a minimum of 2 minutes moving the mix blade from top to bottom. Review manufacturer written specifications for complete application requirements.

442 Two-Part, Bio-Based, Polyurethane Roof Coating System

442.1 Prior to application the surface must be clean, dry, solid, and free of dirt, grease, oil, algae, and other debris. If the bio-based coating is being used over an existing roof system, all appropriate repairs should be made before applying the bio-based system. Allow suggested cure time of repairs before applying the bio-based coating to the roof surface.

442.2 Prime coating substrates using approved primer as recommended by manufacturer for application.

442.3 Coverage Rate: Base coating shall be applied to roof and flashing surfaces at a rate of 3-4 gallons per 100 sq. ft. to achieve a 48 - 64 mils wet film thickness or as recommended by manufacturer for application.

442.4 Mixing: Use a heavy duty power drill with Jiffy Mixer attachment. Cordless drills are not recommended and may not properly mix the materials. Mix Part A for 1 minute before adding Part B. After adding Part B mix the combined materials for a minimum of 2 minutes moving the mix blade from top to bottom. Review manufacturer written specifications for complete application requirements.

442.5 The bio-based base coat requires full reinforcement with fiberglass mat or polyester mat. Fully embed reinforcement into wet coating using a brush or roller until free of voids, wrinkles, air pockets, standing fibers, etc.

442.6 The Top Coat is a two-part, bio-based, polyurethane roof coating.

442.7 The previously applied bio-based base coat must be clean, dry, solid, and free of dirt, grease, oil, algae, and other debris. The bio-based base coat should be top-coated within 72 hours of base coat application.

442.8 Mixing: Use a heavy duty power drill with Jiffy Mixer attachment. Cordless drills are not recommended and may not properly mix the materials. Mix Part A for 1 minute before adding Part B. After adding Part B mix the combined materials for a minimum of 2 minutes moving the mix blade from top to bottom. Review manufacturer written specifications for complete application requirements.

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443 Two part, Bio-Based, Polyurethane Roof Coating System, Non-Reinforced

443.1 Prepare the substrate before applying the bio-based coating to the roof surface.

443.2 Prime coating substrates using approved primer as recommended by manufacturer for application.

443.3 Prior to base coat application, install polyester reinforcement at membrane seams, drains, projections and as required by coating manufacturer. Fully embed reinforcement into a layer of base coating using a brush or roller until free of voids, wrinkles, air pockets, standing fibers, etc. Install according to manufacturer's specifications.

443.4 Coverage Rate: Base coating shall be applied to roof and flashing surfaces at a rate of 2-3 gallons per 100 sq. ft. to achieve a 32 - 48 mils wet film thickness or as recommended by manufacturer for application.

443.5 Mixing: Use a heavy duty power drill with Jiffy Mixer attachment. Cordless drills are not recommended and may not properly mix the materials. Mix Part A for 1 minute before adding Part B. After adding Part B mix the combined materials for a minimum of 2 minutes moving the mix blade from top to bottom. Review manufacturer written specifications for complete application requirements.

443.6 The Top Coat is a two-part, bio-based, polyurethane roof coating.

443.7 The previously applied bio-based base coat must be clean, dry, solid, and free of dirt, grease, oil, algae, and other debris. The bio-based base coat should be top-coated within 72 hours of base coat application.

443.8 Mixing: Use a heavy duty power drill with Jiffy Mixer attachment. Cordless drills are not recommended and may not properly mix the materials. Mix Part A for 1 minute before adding Part B. After adding Part B mix the combined materials for a minimum of 2 minutes moving the mix blade from top to bottom. Review manufacturer written specifications for complete application requirements.

444 Two-part, UV Resistant, Polyurethane Modified Methyl Methacrylate Coating System

444.1 Install polyurethane modified methyl methacrylate base coating with reinforcement followed by top coating. Install according to manufacturer's specifications.

444.2 Repairs: If polyurethane modified methyl methacrylate coating system is being installed over an existing roof system, all appropriate repairs should be made prior to applying the coating system. Allow suggested cure time of repairs before application.

444.3 Polyurethane modified methyl methacrylate coating system can be used over aged asphalt based roof products. When applying over felt roof systems repair any blisters and degraded felts prior to installation.

444.4 Coating system can be applied directly to concrete. Any cracks should be repaired before coating application. Allow new concrete to fully cure for a minimum of 28 days (a concrete dryness test should be performed prior to application).

444.5 Mixing: Use a heavy duty power drill with Jiffy Mixer attachment. Cord-less drills are not recommended and may not properly mix the materials.

444.6 Base Coat must be mixed to achieve a uniform distribution and appearance of the product. Once properly mixed, Base Coat can be poured off in smaller quantities into a second container. Add the appropriate amount of Catalyst to the selected amount of base coat and mix thoroughly until powder catalyst is completely dissolved. Catalyze only the amount of base coat intended to be used within the expected pot life. The Catalyst is mixed with coating to initiate the curing process. The amount of Catalyst needed is based on the amount of base coat used and the ambient temperature.

444.7 Apply base coat over prepared surfaces.

444.7.1 Apply base coating with brush, roller or squeegee at a rate of 2½ gals / 100 sq. ft. (40 wet mils) minimum. Embed polyester reinforcing fabric into wet coating using a brush or roller until free of voids, wrinkles, air pockets, etc. While coating is still wet, apply Base Coat over embedded fabric at 2½ gals / 100 sq. ft. (40 wet mils) minimum. Allow to cure prior to applying top coat.

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444.8 Apply polyurethane modified methyl methacrylate top coating over base coating.

444.8.1 Preparation: The surface of previously applied Base Coat must be clean, dry, solid, and free of dirt, grease, oil, algae, and other debris prior to application of the Top Coat. Repairs: If coating system is being installed over an existing roof system, all appropriate repairs should be made prior to applying the coating system. Allow suggested cure time of repairs before application. Mixing: Use a heavy duty power drill with Jiffy Mixer attachment. Cord-less drills are not recommended and may not properly mix the materials.

444.8.2 Top Coat must be mixed to achieve a uniform distribution and appearance of the product. Once properly mixed, Top Coat can be poured off in smaller quantities into a second container. Add the appropriate amount of Catalyst to the selected amount of top coat and mix thoroughly until powder catalyst is completely dissolved. The Catalyst is mixed with coating to initiate the curing process. Catalyze only the amount of top coat intended to be used within the expected pot life. The amount of Catalyst needed is based on the amount of top coat used and the ambient temperature.

444.8.3 Apply top coating with brush, roller or squeegee at a rate as required by Manufacturer

444.8.4 Pre-formulated high elastomeric thixotropic, two-component, polyurethane modified methyl methacrylate mastic sealant and polyester reinforcement may be used for flashing applications.

445 Metal Restoration with Acrylic Coating.

445.1 Install 100% acrylic resin elastomeric weatherproofing coating system meeting or exceeding the performance requirements of ASTM D 6083. Install 100 percent stich bonded polyester fabric reinforcement at seams, projections and as required by coating manufacturer. Install base and top coating according to manufacturer's specifications.

445.1.1 Coating has a tensile strength of 250 psi per ASTM D 2370, and aged solar reflectance index of 101 and a 390 percent elongation at 73 degrees Fahrenheit per ASTM D 2370.

445.2 Examine existing roofing substrate, for compliance with requirements and for other conditions affecting application and performance of roof coatings. Prepare metal surfaces prior to coating application.

445.2.1 Clean substrate of dust, debris, and other substances detrimental to coating installation according to the coating system manufacturer's written instructions.

445.2.2 Wire brush loose rust from roof surface. Power tool cleaning is preferred but hand tool cleaning is acceptable.

445.2.3 Remove any oil or grease from the surface by either high pressure water blast incorporating a biodegradable detergent or TSP, or the use of clean rags soaked in approved solvent. (SSPC-SP1).

445.2.4 All existing fasteners must be checked and tightened.

445.2.4.1 Replace stripped or missing fasteners using an oversize "repair type" fastener. Add additional fasteners, where necessary, to draw uplifted sheets together.

445.2.4.2 Damaged roof fascia, gutters, vents, ridge caps, flashings, etc., must be replaced to match the existing.

445.3 Bare galvanized metal does not require a primer if there is no rust present. Surface must be clean and dry.

445.3.1 Steel surfaces and metal with rust or corrosion present must be primed as specified.

445.4 Roof Panel Repair and Preparation:

445.4.1 Loose rust, mill scale and paint must be removed by any of the following.

445.4.1.1 Hand tool cleaning to include scraping, sanding, and wire brushing.

445.4.1.2 Power tool cleaning to include power sanding, power wire brushing, or power grinding.

445.4.2 Remove all loose existing acrylic and asphalt coatings and all existing sealants and mastics prior to installing aliphatic polyurethane sealer or acrylic elastomeric sealer. If using acrylic elastomeric sealer for detail work, all rusted areas must be primed prior to the application of the acrylic elastomeric sealer.

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445.4.3 If previously coated, including factory finish, check for adhesion and compatibility of any remaining, tightly adhered, existing coating. To check adhesion of the existing coating film, conduct adhesion test per ASTM D 3359-09.

445.4.4 Perform a test application to determine compatibility with and adhesion of a new coating to a previously coated surface. After application and curing of the coating test area, an X-Cut Tape Test per ASTM D3359-09 is used to determine adhesion and compatibility of the elastomeric coating to the substrate.

445.4.5 If metal panel finish is Kynar 500 or similar, conduct a test application using water-based primer specifically for fluoropolymer/PVDF/Kynar 500 metal surfaces and elastomeric coating. Conduct adhesion test per ASTM D 3359-09.

445.4.6 Roof panels exhibiting holes and/or posing safety concerns shall be replaced with new metal panels with a similar panel design.

445.4.7 Closely inspect underside of all metal panels for corrosion at end laps, curbs and penetrations. Replace as required.

445.5 Prepare existing previously installed asphaltic roof repair areas.

445.5.1 Remove loose mastics from repair area and clean remaining repair surface.

445.5.2 Apply aliphatic polyurethane sealer over the prepared surface at the rate of 30 - 40 lineal feet per gallon in a three-course combination with polyester reinforcement membrane. A three-course combination consists of sealer / fabric / sealer.

445.5.3 Prime metal panel and metal flashing surfaces prior to coating application.

445.5.4 On metal surfaces with Kynar 500 Finish or Similar, prime entire surface with water-based primer specifically for fluoropolymer/PVDF/Kynar 500 metal surfaces at a rate of 200-250 square feet per gallon (6-8 wet mils).

445.5.5 On metal surfaces without Kynar 500 Finish and Bare Galvanized Metal, following cleaning and preparation work, apply Water based acrylic metal primer over the entire roof area at a rate of 100-200 square feet per gallon.

445.5.6 Allow primer to dry prior to elastomeric base coating application.

445.5.7 Roof Penetrations

445.5.7.1 The base of all roof penetrations and curbs, i.e. stacks, vents, etc., must be sealed using aliphatic polyurethane sealer or acrylic elastomeric sealer at the rate of 30 - 40 lineal feet per gallon in a three-course combination with polyester reinforcement. A three-course combination consists of sealer / fabric / sealer.

445.5.8 Seams

445.5.8.1 All end-lap (horizontal) and faulty side-lap (vertical) seams must be treated with polyurethane sealer or acrylic elastomeric sealer back-brushed into any open seam areas. The sealer is best applied by brush. (In typical situations one (1) gallon will cover approximately 60 - 100 lineal feet per gallon. at a thickness of 1/8 inch).

445.5.8.2 Seams with openings greater than 1/8 inch, reinforce polyurethane sealer or acrylic elastomeric sealer with polyester reinforcement membrane in a three-course combination. Approximate coverage for polyurethane sealer or acrylic elastomeric sealer will be 30 - 40 lineal feet per gallon.

445.5.8.3 Seams with greater than 1/4" openings must be drawn together with a self-tapping sheet metal screw and neoprene washer.

445.5.8.4 At all vertical seams apply elastomeric weatherproofing coating at a rate of 1 gallon per 100 square feet (16 wet mils).

445.5.8.5 Ridge Caps

445.5.8.6 All seams on and around ridge cap must be sealed using polyurethane sealer or acrylic elastomeric sealer in a three-course combination. Approximate coverage for polyurethane sealer or acrylic elastomeric sealer will be 30-40 lineal feet per gallon.

445.5.8.7 All seams around ridge ventilators must be sealed using polyurethane sealer or acrylic elastomeric sealer and polyester reinforcement in a three-course combination. Approximate coverage for polyurethane sealer or acrylic elastomeric sealer will be 30 - 40 lineal feet per gallon.

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445.5.8.8 Fasteners

445.5.8.9 Encapsulate all fasteners with polyurethane sealer or acrylic elastomeric sealer (one gallon will encapsulate approximately 150 - 200 fasteners).

445.5.9 Restoration Coating Application

445.5.9.1 If previously applied primer has been applied longer than 72 hours prior to application of coating application, the primer shall need to be reapplied. All surfaces, which have been primed, must be clean and free of dirt, grease, oil and other foreign matter.

445.5.9.2 Air temperature must be 50 degrees Fahrenheit dry and rising and must be a minimum of 5degrees Fahrenheit above the dew point.

445.5.9.3 Mix each container of elastomeric coating with a power assisted mechanical mixer before use. Mix until coating is smooth and consistent. For pails, a Jiffy Mixer attached to a low speed power drill is recommended. For drums, a 600 Series Drum Mixer is recommended. Do not hand mix. Do not thin.

445.5.9.4 Apply elastomeric weatherproofing coating system in two coats at minimum 1 gallon per 100 square feet (16 wet mils) per coat, for a total of 32 wet mils (16 dry mils) minimum. Apply the system using a Base Coat and White (or selected color) Finish Coat. Apply coatings by brush, 3/8 inch nap roller or spray equipment according to manufacturer's specifications.

445.5.9.5 Allow to cure a minimum 24 hours between coats or until it can support the required foot traffic based on specific job site conditions and roof slope, etc. Environmental or site specific conditions may require variations in cure times.

446 Metal Restoration with Aluminum Coating

446.1 Install premium grade metallic pigmented, industrial maintenance coating formulated from specially processed asphaltic liquids, non-drying oils, a blend of natural and synthetic fibers, and aluminum pigment. Install 100 percent stich bonded polyester fabric as required by coating manufacturer. Install in one coat according to manufacturer's specifications

446.1.2 Coating has a minimum 15 percent metallic content per ASTM D2824, reflectance more than 60 per ASTM C 1549-02 and contains 47 percent solids by weight. The aluminum pigment exceeds Federal Specification TT-P-320D, Type 2. Contains no asbestos or glass fibers.

446.2 Examine existing roofing substrate, for compliance with requirements and for other conditions affecting application and performance of roof coatings.

446.3 Prepare metal surfaces prior to coating application.

446.3.1 Remove any oil or grease from the surface as required.

446.3.2 All existing fasteners must be checked and tightened.

446.3.3 Replace stripped or missing fasteners using an oversize "repair type" fastener. Add additional fasteners, where necessary, to draw uplifted sheets together.

446.3.4 Damaged fascia, gutters, vents, ridge caps, flashings, etc., must be replaced to match the existing.

446.4 Roof Panel Repair and Preparation:

446.4.1 Loose rust, mill scale and paint must be removed by any of the following.

446.4.1.1 Hand tool cleaning to include scraping, sanding, and wire brushing.

446.4.1.2 Power tool cleaning to include power sanding, power wire brushing, or power grinding.

446.4.2 Remove all existing acrylic and asphalt coatings and all existing sealants and mastics prior to installing Manufacturer's polyurethane sealer.

446.4.3 If metal panel finish is Kynar 500 or similar, please contact the coating manufacturer for surface preparation recommendations.

446.4.4 If previously coated, check for adhesion and compatibility of any remaining, tightly adhered, existing coating with aluminum coating. A test application to determine compatibility with and adhesion to a previously coated surface. An X-Cut Tape Test is used to determine adhesion of the existing coating to the substrate.

446.4.5 No priming is necessary because of the high amount of rust inhibiting oils in aluminum coating.

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446.4.6 Roof panels exhibiting holes and/or posing safety concerns should be replaced with new metal panels with a similar panel design.

446.4.7 Closely inspect underside of all metal panels for corrosion at end laps, curbs and penetrations. Replace as required.

446.5 Roof Penetrations

446.5.1 The base of all roof penetrations and curbs, i.e. stacks, vents, etc., must be sealed using manufacturer's polyurethane sealer at the rate of 30-40 lineal feet per gallon in a three course combination with polyester fabric. A three course combination consists of sealer/fabric/sealer.

446.6 Seams

446.6.1 All end-lap (horizontal) and faulty side-lap (vertical) seams must be treated with polyurethane sealer back-brushed into any open seam areas.

446.6.2 The polyurethane sealer is best applied by brush. (In typical situations one (1) gallon will cover approximately 60-100 lineal feet of seams at a thickness of 1/8 inch).

446.6.3 Seams with openings between 1/8 – 1/4 inch, reinforce manufacturer's polyurethane sealer with 100 percent stich bonded polyester fabric in a three course combination.

446.6.4 Approximate coverage for polyurethane sealer will be 30-40 lineal feet per gallon. Seams with greater than 1/4 inch openings must be drawn together with a self-tapping sheet metal screw and neoprene washer.

446.7 Ridge Caps

446.7.1 All seams on and around ridge cap must be sealed using manufacturer's polyurethane sealer and 100 percent stich bonded polyester fabric in a three course combination.

446.7.2 Approximate coverage will be 30-40 lineal feet per gallon.

446.7.3 All seams around ridge ventilators must be sealed using manufacturer's polyurethane sealer and 100 percent stich bonded polyester fabric in a three course combination.

446.7.4 Approximate coverage for the polyurethane sealer will be 30-40 lineal feet per gallon.

446.8 Fasteners

446.8.1 Seal fasteners with repair manufacturer's polyurethane sealer. Cover bolt completely with 1/4 inch minimum thickness.

446.9 Restoration Coating Application

446.9.1 Using heavy-duty spray equipment, roller or brush, Alumanation 301 should be applied at the rate of 2 gallons per 100 square feet (32 wet mils). Mix well using a power-assisted mixer.

446.9.2 Do not permit traffic on completed roof surfaces unless absolutely necessary, and only after complete cure.

447 Brick, Remove and Install New Standard Brick

447.1 Remove existing brick and replace with new to match existing.

447.2 Masonry components

447.2.1 Water: Potable.

447.2.2 Masonry sand: ASTM C 144-93. Shall contain no more than 0.5% lightweight aggregate particles. Shall be free of coal, grains, wood, and other organic impurities. Shall be washed and free of expansive clay.

447.2.3 Hydrated lime: ASTM C 207-91(1992), Type S, non-air-entrained. Do not use unslaked lime. Follow manufacturer's written hydration procedures if lime putty is used.

447.2.4 Portland cement: ASTM C 150-94, Type I.

447.2.5 Mortar: ASTM C 270-92, Type N. Proportions by volume 1:1.25:5 (portland cement: hydrated lime: masonry sand). Do not use ground limestone.

447.2.6 Mortar coloring material: Inert, non-fading, alkali fast oxides, finely ground, made especially for cement/lime mortars, to match existing color. Color quantity no more than 6% by weight. Match existing color.

447.2.7 Face brick: Use new brick to match existing in sizes, texture, and color to Owner's satisfaction.

447.2.8 Packing for weep slots: Glass wool batts.

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447.3 At locations indicated, remove bricks that are damaged, spalled, or deteriorated. Carefully demolish or remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.

447.4 When removing single bricks, remove material from center of brick and work toward outside edges.

447.5 Support and protect remaining masonry that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

447.6 Notify Owner' representative of unforeseen detrimental conditions including voids, cracks, bulges, and loose masonry units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.

447.7 Remove in an undamaged condition as many whole bricks as possible.

447.8 Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.

447.9 Store brick for reuse, as indicated.

447.10 Deliver cleaned brick not required for reuse to Owner, unless otherwise directed.

447.11 Clean bricks surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.

447.12 Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

447.13 Lay replacement brick with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C 67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. (30 g/194 sq. cm per min.). Use wetting methods that ensure that units are nearly saturated but surface is dry when laid. Maintain joint width for replacement units to match existing joints.

447.14 Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.

447.15 Rake out mortar used for laying brick before mortar sets and point new mortar joints in repaired area to comply with requirements for repointing existing masonry, and at same time as repointing of surrounding area.

448 Structural Analysis/Engineering Services

448.1 Building structure shall be evaluated by a structural engineer to determine, condition, additional dead load and live load capacity.

448.2 The engineer shall be a qualified, registered and licensed in the project state, and experienced in design similar to that required for Project.

449 Multiplication factor for roofs greater than 10,000 and under 20,000 square feet

450 Multiplication factor for roofs greater than 5,000 and under 7,000 square feet

451 Multiplication factor for roofs greater than 3,000 and under 5,000 square feet

452 Multiplier for roofs less than 1,000 square feet

453 Emergency Leak Repair per 1/2 Man Day

453.1 Perform emergency temporary or permanent remedial repairs to resolve emergency leak conditions and bring roof back to a watertight condition.

454 10 year Restoration Warranty Under 10,000 Square Feet, Standard.

454.1 Issue a manufacturer's 10 year Roof Restoration System Warranty once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

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455 10 year Restoration Warranty Over 10,000 Square Feet, Standard.

455.1 Issue a manufacturer's 10 year Roof Restoration System Warranty once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

456 12 year Restoration Warranty Under 10,000 Square Feet, Standard.

456.1 Issue a manufacturer's 12 year Roof Restoration System Warranty once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

457 12 year Restoration Warranty Over 10,000 Square Feet, Standard.

457.1 Issue a manufacturer's 12 year Roof Restoration System Warranty once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

458 12 year Restoration Warranty Under 10,000 Square Feet, Inspections in Years 2, 5, &10.

458.1 Issue a manufacturer's 12 year Roof Restoration System Warranty once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

458.2 Provide maintenance inspections and general housekeeping in years 2, 5, & 10

459 12 year Restoration Warranty Over 10,000 Square Feet, Inspections in Years 2, 5, &10.

459.1 Issue a manufacturer's 12 year Roof Restoration System Warranty once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

459.2 Provide maintenance inspections and general housekeeping in years 2, 5, & 10

460 15 year Restoration Warranty Under 10,000 Square Feet, Inspections in Years 2, 5, 10 &15.

460.1 Issue a manufacturer's 15 year Roof Restoration System Warranty once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

460.2 Provide maintenance inspections and general housekeeping in years 2, 5, 10 & 15

461 15 year Restoration Warranty Over 10,000 Square Feet, Inspections in Years 2, 5, 10 &15.

461.1 Issue a manufacturer's 15 year Roof Restoration System Warranty once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

461.2 Provide maintenance inspections and general housekeeping in years 2, 5, 10 & 15

462 Warranty 15 year option roofs Under 10,000 Square Feet Minimum charge Standard.

462.1 Issue a manufacturer's 15 year Roof Restoration System Warranty once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

463 Warranty 15 year option roofs Under 10,000 Square Feet, Inspections in Years 2, 5, 10, & 15.

463.1 Issue a manufacturer's 15 year Roof Restoration System Warranty once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

463.2 Provide maintenance inspections and general housekeeping in years 2, 5, 10, & 15

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464 Warranty 15 year option roofs Over 10,000 Square Feet, Standard.

464.1 Issue a manufacturer's 15 year Roof Restoration System Warranty once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

465 Warranty 15 year option roofs Over 10,000 Square Feet, Inspections in Years 2, 5, 10, & 15.

465.1 Issue a manufacturer's 15 year Roof Restoration System Warranty once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

465.2 Provide maintenance inspections and general housekeeping in years 2, 5, 10, & 15

466 20 year Restoration Warranty Under 10,000 Square Feet, Inspections in Years 2, 5, 10 & 15.

466.1 Issue a manufacturer's 20 year Roof Restoration System Warranty roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

466.2 Provide maintenance inspections and general housekeeping in years 2, 5, 10, & 15

467 20 year Restoration Warranty Over 10,000 Square Feet, Inspections in Years 2, 5, 10 & 15.

467.1 Issue a manufacturer's 20 year Roof Restoration System Warranty roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

467.2 Provide maintenance inspections and general housekeeping in years 2, 5, 10, & 15

468 20 year Replacement Warranty Under 10,000 Square Feet, Inspections in Years 2, 5, 10 & 15.

468.1 Issue a manufacturer's 20 year Roof System Warranty for the roof replacement area once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

468.2 Provide maintenance inspections and general housekeeping in years 2, 5, 10, & 15

469 20 year Replacement Warranty Over 10,000 Square Feet, Inspections in Years 2, 5, 10 & 15.

469.1 Issue a manufacturer's 20 year Roof System Warranty for the roof replacement area once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

469.2 Provide maintenance inspections and general housekeeping in years 2, 5, 10, & 15

470 20 year Replacement Warranty Under 10,000 Square Feet, Inspections in Years 2, 5, 10 & 15. No Maintenance

470.1 Issue a manufacturer's 20 year Roof System Warranty for the roof replacement area once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

471 20 year Replacement Warranty Over 10,000 Square Feet, Inspections in Years 2, 5, 10 & 15. No Maintenance

471.1 Issue a manufacturer's 20 year Roof System Warranty for the roof replacement area once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

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472 30 year Replacement Warranty Under 10,000 Square Feet, Inspections in Years 2, 5, 10, 15, 20, 25 & 30.

472.1 Issue a manufacturer's 30 year Roof System Warranty for the roof replacement area once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

472.2 Provide maintenance inspections and general housekeeping in years 2, 5, 10, 15, 20, 25 & 30

473 30 year Restoration Warranty Under 10,000 Square Feet, Inspections in Years 2, 5, 10, 15, 20, 25 & 30.

473.1 Issue a manufacturer's 30 year Roof Restoration System Warranty roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

473.2 Provide maintenance inspections and general housekeeping in years 2, 5, 10, 15, 20, 25 & 30

474 30 year Replacement Warranty Over 10,000 Square Feet, Inspections in Years 2, 5, 10, 15, 20, 25 & 30.

474.1 Issue a manufacturer's 30 year Roof System Warranty for the roof replacement area once roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

474.2 Provide maintenance inspections and general housekeeping in years 2, 5, 10, 15, 20, 25 & 30

475 30 year Restoration Warranty Over 10,000 Square Feet, Inspections in Years 2, 5, 10, 15, 20, 25 & 30.

475.1 Issue a manufacturer's 30 year Roof Restoration System Warranty roof system is complete, manufacturer's requirements are met and the manufacturer's representative approves the finished system.

475.2 Provide maintenance inspections and general housekeeping in years 2, 5, 10, 15, 20, 25 & 30

476 Warranty Extension 5 yr 5,000 sf or less

476.1 Extend an existing or recently expired Tremco Warranty for an additional five (5) years on roofs 5,000 square feet or less. Roof inspection and limited housekeeping will be performed in year four (4) of the warranty period.

477 Warranty Renewal 5 yr 5000 sf or less

477.1 Renew an expired Tremco Warranty for a period of five (5) years on roofs 5,000 square feet or less. Roof inspection and limited housekeeping will be performed in year four (4) of the Warranty period.

478 Warranty Extension 5 yr 5001 sf -19,999 sf

478.1 Extend an existing or recently expired Tremco Warranty for an additional five (5) years on roofs 5001 square feet and 19,900 square feet. Roof inspection and limited housekeeping will be performed in year four (4) of the Warranty period.

479 Warranty Renewal 5yr 5, 5001 sf-1999 sf

479.1 Renew an expired Tremco Warranty for a period of five (5) years on roofs 5001 square feet and 19,900. Roof inspection and limited housekeeping will be performed in year four (4) of the Warranty period.

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480 Warranty Extension 5yr 20,000sf-49,999 sf

480.1 Extend an existing or recently expired Tremco Warranty for an additional five (5) years on roofs 20,000 square feet and 49,900 square feet. Roof inspection and limited housekeeping will be performed in year four (4) of the warranty period.

48l Warranty Renewal 5yr 20,000 sf-49,999sf

481.1 Renew an expired Tremco Warranty for a period of five (5) years on roofs 20,000 square feet and 49,900 square feet. Roof inspection and limited housekeeping will be performed in year four (4) of the warranty period.

482 Warranty Extension 5yr 50,000 sf and greater

482.1 Extend an existing or recently expired Tremco Warranty for an additional five (5) years on roofs 50,000 square feet or greater. Roof inspection and limited housekeeping will be performed in year four (4) of the warranty period.

483 Warranty Renewal 5 yr 50,000 sf and greater

483.1 Renew an expired Tremco Warranty for a period of five (5) years on roofs 50,000 square feet or greater. Roof inspection and limited housekeeping will be performed in year four (4) of the warranty period.

484 Warranty Extension 5yr 100,000 sf and greater

484.1 Extend an existing or recently expired Tremco Warranty for an additional five (5) years on roofs 100,000 square feet or greater. Roof inspection and limited housekeeping will be performed in year four (4) of the warranty period.

485 Warranty Renewal 5yr 100,000 sf and greater

485.1 Renew an expired Tremco Warranty for a period of five (5) years on roofs 100,000 square feet or greater. Roof inspection and limited housekeeping will be performed in year four (4) of the warranty period.

486 Roof Coating-High Solids, Water Based, Heavy Bodied Elastomeric Coating Formulated with an Acrylic Latex Polymer

486.1 Install reflective elastomeric roof coating over roof surface.

486.2 Install reflective elastomeric roof coating consisting of high solids, water-based, heavy bodied elastomeric coating formulated with a nanotechnology-engineered blend of acrylic latex polymer.

486.3 Roof coating Reflectance is 83.2 percent per ASTM C 1549-04, Solar Reflectance Index is 103 per ASTM E 1980-01 and Density 11,800 cP per ASTM D 2196-99.

486.4 Surface Preparation: All fresh applications of mastics and asphalt coatings require a minimum 30 day cure period prior to coating application. All asphaltic surfaces, including granule surfaced modified bitumen membranes, require light priming with water based asphalt primer, at a coverage rate of 200-400 square feet per gallon. Allow primer to fully dry. Primer and coating must be applied the same day.

486.5 Apply Reflective Elastomeric Coating using brush or airless sprayer.

486.6 Airless Spray: Pneumatic, hydraulic or electric pump with a minimum 2,000 psi material output pressure and an output flow rate of 3 GPM or better. Reversible spray tip with a 0.035'' to 0.052'' orifice and a 40° to 60° spray fan. Material spray lines must be properly rated for the maxi-mum working pressure of the pump being used. During spray application, take necessary precautions to avoid overspray.

486.6.1 Over entire cleaned, prepared surface, apply coating in a one or two coat application based on existing temperature and weather conditions.

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486.6.2 Apply coating at a coverage rate of 4 gallons per 100 square feet for single coverage and 2 gallons per 100 square feet (per coat) for two coat applications. Provide a total coverage of approximately 45 dry mil film thickness.

486.6.3 For two coat applications, allow first coat to fully dry to support foot traffic without tracking before application of second coat.

486.6. 4 Drying time will vary based on weather conditions during application. Drying times will be longer under cool temperature, high humidity and/or overcast conditions. Drying time will improve under sunny or breezy conditions.

486.6.5 Vertical surfaces require 2 coat application to minimize potential for sag of coating

486.6.6 Allow sufficient time for coating to cure prior to end of the day. Application shall cease a minimum of 4 hours prior to sunset.

486.6.7 Avoid foot traffic for 5 days minimum on final surface coat especially under high humidity conditions. Tracking may occur for approximately 1 week following application, especially under high humidity or cool ambient conditions.

487 Roof Coating-High Solids, Water Based, Heavy Bodied Elastomeric Coating with Reinforcement

487.1 Install Reflective Elastomeric Roof Restoration System over roof membrane surfaces using Reinforcing Fabric embedded in a full application of Rubberized Asphalt Emulsion Coating.

487.2 Install reflective elastomeric roof coating consisting of high solids, water-based, heavy bodied elastomeric coating.

487.3 Reflective Roof Coating Reflectance is 83.2 percent per ASTM C 1549-04, Solar Reflectance Index is 103 per ASTM E 1980-01 and Density 11,800 cP per ASTM D 2196-99.

487.4 Rubberized Asphalt Emulsion Coating consists of a non-fibered, asbestos free neoprene rubber modified asphalt emulsion. Coating is water-based, low in odor, meets the strict VOC requirements for roof coatings in California's South Coast Air Quality Management District and the US EPA's National VOC Emission Standard for Architectural Coatings (AIM).

487.5 Emulsion coating Elongation is 100 percent per ASTM D412-06a and density 8.6 lbs per gallon per ASTM D 1475-98.

487.6 Reinforcing Fabric is a recycled 100 percent stich bonded polyester fabric mat with excellent tensile and tear strength. Reinforcing Fabric is infused with a non-hazardous quick break additive that is designed exclusively for use with the Roof Coating System.

487.7 Surface Preparation: All fresh applications of mastics and asphalt coatings require a minimum 30 day cure period prior to coating application. All asphaltic surfaces, including granule surfaced modified bitumen membranes, require light priming with water based asphalt primer, at a coverage rate of 200-400 square feet per gallon. Allow primer to fully dry. Primer and coating must be applied the same day.

487.8 Prior to application, prepare all single ply membranes. Repair surfaces as necessary. After repairs are fully cured, prime single ply surfaces with SP Primer. Allow primer to fully dry prior to application of coating.

487.9 Install one (1) to three (3) ply application of Reinforcing Fabric in Rubberized Asphalt Emulsion.

487.9.1 Install Reinforcing Fabric according to manufacturer's written instructions, starting at low point of roofing system. Place ply sheets to ensure water will flow over or parallel to, but never against exposed edges. Shingle side laps of ply felts uniformly throughout.

487.9.2 Install fabric over roof and all wall, curb, and projection bases in a uniform and continuous application of ply adhesive.

487.9.3 Spray or brush-apply emulsion coating onto the surface. On irregular surfaces, broom coating into the surface to assure the emulsion will fill and cover minor surface irregularities. Apply adhesive at a minimum rate of 4 gallons per 100 square feet per ply.

487.9.4 Immediately install Reinforcing Fabric into the wet emulsion coating. Promptly roll or broom the fabric to eliminate wrinkles and assure positive embedment.

487.9.4.1 Shingle plies in direction to shed water.

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487.9.4.2 Provide minimum 4" side laps and minimum 6" end laps.
487.9.4.3 Overlap previous day's work 24 inches.
487.9.4.4 Do not allow foot traffic on fabric ply during application.
487.9.5 In order for system to cure as intended, emulsion coating must be in direct contact with Reinforcing Fabric. Do not allow emulsion to extend out beyond edge of fabric in excess of 1". Allow Reinforcing Fabric to dry minimum 1 hour.
487.9.6 Drying time and final cure will vary based on weather conditions during application. Drying times will be longer under cool temperature, high humidity, and/or over cast conditions.
487.9.7 Once installed fabric ply is visibly dry and able to support foot traffic without tracking, apply top coating of Reflective Elastomeric Coating directly over Reinforcing Fabric.
487.9.8 Install Reinforcing Fabric and Reflective Elastomeric Coating on same day.
487.9.9 Apply Reflective Elastomeric Coating using brush or airless sprayer.
487.9.9.1 Airless Spray: Pneumatic, hydraulic or electric pump with a minimum 2,000 psi material output pressure and an output flow rate of 3 GPM or better. Reversible spray tip with a 0.035'' to 0.052'' orifice and a 40° to 60° spray fan. Material spray lines must be properly rated for the maxi-mum working pressure of the pump being used. During spray application, take necessary precautions to avoid overspray.
487.9.10 Over entire cleaned, prepared surface, apply coating in a one or two coat application based on existing temperature and weather conditions.
487.9.11 Apply coating at a coverage rate of 4 gallons per 100 square feet for single coverage and 2 gallons per 100 square feet (per coat) for two coat applications. Provide a total coverage of approximately 45 dry mil film thickness.
487.9.12 For two coat applications, allow first coat to fully dry to support foot traffic without tracking before application of second coat.
487.9.13 Drying time will vary based on weather conditions during application. Drying times will be longer under cool temperature, high humidity and/or overcast conditions. Drying time will improve under sunny or breezy conditions.
487.9.14 Vertical surfaces require 2 coat application to minimize potential for sag of coating
487.9.15 Allow sufficient time for coating to cure prior to end of the day. Application shall cease a minimum of 4 hours prior to sunset.
487.9.16 Avoid foot traffic for 5 days minimum on final surface coat especially under high humidity conditions. Tracking may occur for approximately 1 week following application, especially under high humidity or cool ambient conditions.

488 AIR BARRIER LINE ITEMS

489 Foam Roof/Wall Intersection - Under 20ft

490 Foam Roof/Wall Intersection - Over 20ft

491 Seal roof top exhaust fan curb mountings

492 Adding foam board as a filler in large openings, i.e.: above soffits

493 Interior miscellaneous foam application - Under 20ft

494 Weatherstrip and install sweep - single commercial door

495 Weatherstrip and install sweep - double commercial door

496 Seal Mechanical Rooms (With wall / roof pipe projections)

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497 **Seal individual plumbing, pipe or duct**

498 **Seal Windows (exterior only, sub-k must provide estimate)**

499 **Weatherstrip operable wood or aluminum windows with replacement finseal pile or foam tape or vinyl "V" strips**

500 **Weatherstrip steel frame and sash windows with in-situ silicone gasket. 2 trips required.**

501 **Interior caulking of window and door frames with clear paintable caulk**

502 **Miscellaneous Interior caulking with clear paintable caulk**

503 **Weatherstrip Overhead Garage Doors (12ft x12ft) 48ft LF w/rubber fins on bottom. Install face mounted leaf seal product to the bottom face of the door as the thresholds on doors (concrete)**

504 **Blower Door Testing.**

504.1 Final air barrier performance test and report as specified in contract. Air barrier testing report and Infrared inspection report delivered within 10 business days.

505 **Thermography inspection performed during final test and thermography inspection. (Based on 60,000 sq. ft. elementary school).**

505.1 Infrared moisture survey.

505.2 A sensitive infrared scanner is used to detect temperature differentials across the building area. The analysis is conducted at night when areas of wet insulation or air leakage show as warmer areas. Areas are identified and then marked for further analysis and possible repair.

506 **Blower Door Directed Air Sealing - Supervision Only**

506.1 Supervise blower door sealing.

507 **Building Envelope Assessment**

507.1 Comprehensive in-field assessment of existing conditions to determine if a durable, continuous and correctly aligned air and thermal barrier is installed. Provide Assessment Report with recommendations. Phone and email consultations to review progress on an as needed basis.

508 **Mileage rate**

509 **Performance and payment bond - bonding rate (percent of project)**

510 **Bonding capacity - total amount of capacity available**

511 **Multiplier/factor to be applied to the R.S. Means costs for The National Cooperative Contractor Network**

511.1 The Contractor's proposal pricing is based on the most current Online RS Means Cost Data, sorted by location code. Locations are defined as the "closest" code, as dictated by the first three (3) numbers of the AEPA member's zip code.

511.2 The zip code will be used to determine the city cost index (CCI) at the AEPA member's site. Contractor will only use the following cost data titles as noted in AEPA IFB 021-D Part B – Specifications:

a. Repair and Remodeling Cost Data

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b. Building Construction Cost Data
c. Facility Construction Cost Data

511.3 A discount coefficient is required to further modify the RS Means final price and is less than 1.0 therefore offering AEPA members an additional discount. This discounted percentage is found in F.2 Line 27 and applies a RS Means multiplier/factor of 92%. Prevailing wage rates will be paid according to the requirements of each state.

511.4 The selected Contractor will furnish a line item estimate for the unique conditions of the building from the most current RS Means Construction Cost Index Guide. Awarded proposals will be equal to, or less than, the amount of the line item estimate, which is fully transparent, audible, consistent and fair.

512 Multiplier - roof height is greater than 2 stories; equal to or less than 5 stories

512.1 Additional elevations require additional safety requirements and extra material handling to move material from ground storage to roofing project which cannot be done by simple hoists. Project is considered less efficient because of extra lifting and hoisting aspects and the project cannot be completed in a normal work process.

512.2 Project demolition requires crane time to remove trash or special chuting and or scaffold support of demolition debris and roof top trash. Removal is considered less efficient due to reduced size of roof top containers.

512.3 Project requires additional crane work to accomplish the project.

512.4 Project safety requirement for building access egress becomes more stringent to protect pedestrian traffic.

512.5 Additional percentage applied to project cost. Any surcharge costs will be determined up front and agreed upon between the buyer and the Contractor as included in the initial cost quotation and purchase order.

513 Multiplier - roof height is greater than 5 stories; equal to or less than 10 stories

513.1 Additional elevations require additional safety requirements and extra material handling to move material from ground storage to roofing project which cannot be done by simple hoists. Project is considered less efficient because of extra lifting and hoisting aspects and the project cannot be completed in a normal work process. Project has limited or no internal access.

513.2 Project demolition requires crane time to remove demolition debris and roof top trash. Removal is considered less efficient due to reduced size of roof top containers.

513.3 Project safety requirement for building access egress becomes more stringent to protect pedestrian traffic.

513.4 Additional percentage applied to project cost. Any surcharge costs will be determined up front and agreed upon between the buyer and the Contractor as included in the initial cost quotation and purchase order.

514 Multiplier - roof height is greater than 10 stories

514.1 Additional elevations require additional safety requirements and extra material handling to move material from ground storage to roofing project which cannot be done by simple hoists. Project is considered less efficient because of extra lifting, extra staging and hoisting aspects and the project cannot be completed in a normal work process. Project has limited or no internal access.

514.2 Project tear requires crane time to remove demolition debris and roof top trash. Removal is considered less efficient due to reduced size of roof top containers.

514.3 Project safety requirement for building access egress becomes more stringent to protect pedestrian traffic.

514.4 Additional percentage applied to project cost. Any surcharge costs will be determined up front and agreed upon between the buyer and the Contractor as included in the initial cost quotation and purchase order.

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515 Multiplier - roof has large amount of penetrations and roof top obstructions

515.1 To be applied when open roofing area is limited due to a large number of roof penetrations such as soil stacks, sky lights, roof drains, exhaust vents, HVAC units.

515.2 To be applied when open roofing area is limited due to a large number of roof top obstructions such as pipes, duct work, electrical conduit, hose supply conduit, etc.

515.3 Additional percentage applied to project cost. Any surcharge costs will be determined up front and agreed upon between the buyer and the Contractor as included in the initial cost quotation and purchase order.

516 Multiplier - roof is considered non-standard architecture or has > 4:12 slope

516.1 Multiplier is applied when Roof Area is not square in shape, contains multiple sharp angles and/or curves.

516.2 Or roof slope is greater than 4/12 slope. Tear off and replacement is less efficient in the construction of the roof system and requires additional safety precautions.

516.3 Projects is constructed in a less efficient manner, requires extra work to create watertight roof system. Staging of material on roof is more difficult.

516.4 Additional percentage applied to project cost. Any surcharge costs will be determined up front and agreed upon between the buyer and the Contractor as included in the initial cost quotation and purchase order.

517 Multiplier - roof is less than 3,000 square feet but greater than 1,000 square feet

518 Multiplier - roof size is greater than 7,000 square feet but less than 10,000 square feet

519 Multiplier- City, town or county permit fee for construction project local to members location.

519.1 Fee for local building department fees for review of plans and specification charged to members project.

519.2 Additional percentage applied to project cost. Any permit fee costs will be determined up front and agreed upon between the buyer and the Contractor as included in the initial cost quotation and purchase order.

520 Multiplier- Working in Metro or Urban areas.

520.1 City locations requiring additional logistical measures to compete the roofing project.

520.2 Mobilization, demobilization, staging, traffic control, material handling, disposal and set up labor costs cannot be covered by the bid line items for roofing due to the restraints of metro or urban projects.

520.3 Additional percentage applied to project cost. Any surcharge costs will be determined up front and agreed upon between the buyer and the Contractor as included in the initial cost quotation and purchase order.

521 Construction Distributor Material For Repair Work

521.1 Materials that are purchase from a construction distributor for repair work.

521.2 Materials to be purchased that are not offered in the contractor's material price book.

521.3 Contractor allowable mark up on distributor material is 15 percent.

521.4 Contractor will furnish buyer invoices for material purchased from construction distributor as requested.

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522 Building/Construction Superintendent

522.1 Provide management of project. Attends project construction meeting, Schedules project start date with subcontractor and owner's representative. Conducts job walk. Site reviewed for set up and material storage areas.

522.2 Reviews and coordinates material delivery to project with the subcontractor. Inspects material at time of unloading. Accepts or rejects material based on condition. Ensures materials are covered and secured per site specific plan.

522.3 Reviews site specific safety plan with subcontractor. Ensures safety is in place prior to project start. Ensures subcontractor's Forman and crew are aware of the plan and specification for the project. Follows project schedule. Works with subcontractor's performance to maintain schedule.

522.4 Provides oversight of the installation of the materials used to weatherize the building. Monitors the installation to ensure the materials and methods of installation comply with projects specification. Reviews safety with foreman. Verifies that nightly tie in of roofing system. Reviews with subcontractor at end of the day's work to ensure the project is clean of debris, all hot materials have cooled, and equipment is properly shut down.

522.5 Prepares field reports for owner representative. Takes photographs of construction progress. Meets with owners representatives. Informs/coordinates activity to minimize disruption of owners core business.

523 Building/Construction Manager

523.1 The construction manager plans the work and lays out the tasks for the construction team. The construction manager duties include forecasting and determining the work that needs to be done for the proposed project. Scope development and site investigation in conjunction with owner's representative(s). Conduct preproposal site visits with subcontractor(s) and other vendor(s). Work with construction team to develop cost estimates. Work with other team members to present cost estimates based on the line item schedule. If required, creates and maintains submittal register. Coordinates all aspect of project with owner's representative(s). Deliver required submittals to all members of the construction team and subcontractor(s). Reviews required permits and ensures compliance. Develop site specific requirements for the construction team including mobilization. Review site specific safety plan with subcontractors and vendors.

523.2 Attends required project meeting(s). Instructs project superintendent and subcontractor(s) of the requirements of the project deliverables. Reviews progress reports, directs superintendents communicates with subcontractor(s)' management team. Resolves issues related to project activity as reported by project superintendent.

523.3 Communicates with owner's representative(s) and attends progress meetings when possible. Communicates owner's comments to construction team. Resolves disputes with construction team. Ensures owner's project meets the specification, timelines and budgets.

523.4 Prepares monthly progress draws to owner's representative(s). Authorizes payments to subcontractor(s) and vendor(s). Resolves questions for owner's representative(s). Meets with owner's representative(s) as required. Prepares project close out information and ensures final inspection and warranty documents are issued to owner. Prepares final billing for project. Works to ensure site is returned to a clean condition and all construction elements have been demobilized.

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