PERFORMANCE SPECIFICATIONS

1.0 SCOPE OF WORK/SUPPLEMENTARY CONDITIONS

Pursuant to the provisions of O.S. 61 and Title 580 Department of Central Services, Chapter 20 Construction and Properties Division Rules, et seq.,:

All installed roofing systems must meet the Code and Regulatory Requirements and Recommendations of the most current edition of:
The International Code Council (all Codes) including the International Building Code and its References
All adopted Codes of the Oklahoma State Fire Marshall
All recommendations of the National Roofing Contractor's Association, (NRCA)
Sheet Metal and Air Conditioning Contractor's National Association, (SMACNA)
All requirements of the State of Oklahoma Roofing Program and the State of Oklahoma Roof Warranty, Roofing System Manufacturer's Warranty, (RSMW)
All applicable American Society for Testing and Materials, (ASTM) Standards, (partial list below)
The requirements of U.L. 790 and U.L. 580
FM Global Approval Standards 4450, 4470, 4471, 4435, 4451, and 4454
All applicable FM Loss Prevention Data Sheets, including FM Data Sheets 1-34, 1-28, 1-29, and 1-49

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All installed roofing systems provided as roofing renovations through the use of this Roofing Maintenance Contract must be FM Approved Roof Constructions.

Continued approval is based upon production or availability of the product as FM Approved, the continued use of acceptable quality control procedures, satisfactory field experience, and compliance with the terms stipulated in the Approval Agreement.

The roof assemblies shown (in the current Factory Mutual Approval Guide/Roof Nav Database) are FM Approved only when assembled as listed for each specific cover, insulation, fastener, deck or structural substrate. Their compatibility with other roofing components within the construction is the responsibility of the listed manufacturer, who should be consulted prior to their use. Their performance is extremely dependent upon the substrate to which the system is attached or anchored.

Corner and Perimeter Enhancements: The FM Approved roof assemblies have been evaluated for exposure to wind loads in the field (interior) of the roof. The wind uplift loads acting at the roof corners and the roof perimeter are generally higher than the load acting in the field of the roof. To compensate for these higher loads, enhancements must be made for the securement of all components in the roof assembly. These enhancements are discussed in detail in FM Global Property Loss Prevention Data Sheets 1-28, 1-29 and 1-31.

Roof Decks: For securement requirements of the roof decking for minimum Class 1-60 wind uplift rated roofs, refer to FM Global Property Loss Prevention Data Sheet 1-28. It is understood that the Contractor(s) awarded a contract will comply with the most stringent industry-standard construction requirements and detail drawings published in the National Roofing Contractors Association's "Roofing and Waterproofing Manual," current edition.

The State of Oklahoma, acting through the Construction and Properties Division, is only interested in providing premium systems with a documented life cycle cost benefit when compared to regular low-cost roofing. Subcontractors are encouraged to support bidding efforts of Contractors to result in the very best roofing solutions at competitive prices. Although some facilities with asbestos abatement needs, i.e. Asbestos Containing Roofing Materials, ACRM, may bid removal directly, this contract requires a Contractor to be able to offer abatement services as part of their bid response.

Response Times: Normal: (72 clock hours); Emergency: (12 clock hours).

PARTIAL LIST OF APPLICABLE ASTM STANDARDS

THE MOST CURRENT FOLLOWING ASTM STANDARDS SUPERSEDE RELATED STANDARDS AS CITED IN THESE SPECIFICATIONS AND ELSEWHERE IN THIS PROJECT MANUAL:

D 1761	Test Methods for Mechanical Fasteners in Wood
D 3468	Liquid-Applied Neoprene and Chlorosulfonated Polyethylene Used in Roofing and Waterproofing
D 4434	Poly (Vinyl Chloride) Sheet Roofing
D 371	Asphalt Roll Roofing (Organic Felt) Surfaced with Mineral Granules; Wide Selvage
D 4869	Asphalt-Saturated Organic Felt Shingle Underlayment Used in Roofing
D 3462	Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules
D 225	Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules
D 1970	Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam
D 224	Smooth-Surfaced Asphalt Roll Roofing (Organic Felt)
D 3746	Impact Resistance of Bituminous Roofing Systems
D 41	Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing
D 2833	Asphalt Roof Cement
D 2823	Asphalt Roof Coatings
D 4586	Asphalt Roof Cement, Asbestos-Free
D 4479	Asphalt Roof Coatings, Asbestos-Free
D 5643	Coal Tar Roof Cement, Asbestos-Free
D 3019	Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, Asbestos Fibered, and Non Asbestos Fibered
D 31295a	Asphalt Used in Roofing
D 450	Coal Tar Pitch Used in Roofing, Damp proofing, and Waterproofing
D 1863	Mineral Aggregate Used on Built-Up Roofs
E 1592	Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
D 3747	Emulsified Asphalt Adhesive for Adhering Roof Insulation
D 1227	Emulsified Asphalt Used as Protective Coating for Roofing
D 4601	Asphalt-Coated Glass Fiber Base Sheet Used in Roofing
D4897	Asphalt-Coated Glass-Fiber Venting Base Sheet Used in Roofing
D 2178	Asphalt Glass Felt Used in Roofing and Waterproofing
D 3909	Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules
D 249	Asphalt Roll Roofing (Organic Felt) Surfaced with Mineral Granules
D 2626	Asphalt-Saturated and Coated Organic Felt Base Sheet Used in Roofing
D 226	Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
D 4990	Coal Tar Glass Felt Used in Roofing and Waterproofing
D 227	Coal Tar Saturated Organic Felt Used in Roofing and Waterproofing
D 6162	Styrene Butadiene Styrene (SBS) Modified Bitumen Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements
D 6163	Styrene Butadiene Styrene (SBS) Modified Bitumen Sheet Materials Using Glass Fiber Reinforcements
D 6164	Styrene Butadiene Styrene (SBS) Modified Bitumen Sheet Materials Using Polyester Reinforcements
D 5665	Thermoplastic Fabrics Used in Cold Applied Roofing and Waterproofing
D 5726	Thermoplastic Fabrics Used in Hot Applied Roofing and Waterproofing
D 4637	EPDM Sheet Used in Single-Ply Roof Membrane
D 6083	Liquid Applied Acrylic Coating Used in Roofing
C 1167	Clay Roof Tiles
A 792/A 792/M	Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by Hot Dip Process
A755/A 755/M	Steel Sheet, Metallic Coated by the Hot-Dip Process and Pre painted by the Coil-Coating Process for Exterior Exposed Building Products
A 875/A 875/M	Steel Sheet, Zinc – 5% Aluminum Alloy-Coated by the Hot-Dip Process
A653/A 653/M-	Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron-Alloy-Coated (Galvanized) by the Hot-Dip Process

E 108	Fire Tests of Roof Coverings
E 84	Surface Burning Characteristics of Building Materials
C 836	High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
C 957	High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface

2.0 PERFORMANCE SPECIFICATIONS

2.1 WATERPROOFING AND DAMPPROOFING

2.1 10 100 Pressure cleaning

2.1 10 101 Use power washer unit at pressures of 2,000-5,000 psi with flow rates of 4 to 14 gallons per min.
2.1 10 102 Use only clean, fresh water to remove oil, dirt, grease, chalk and other debris.
2.1 10 103 Vary tip size and distance from the surface to be cleaned according to the type and amount of contaminants on surface.
2.1 10 104 Wash surface with clean water after cleaning to remove residue.

2.1 10 150 Bio-Algaecide, one application, equivalent to Bio-Genesis

2.1 10 151 Spray bio-algaecide at the rates and resting times specified by the manufacturer.
2.1 10 152 Wash surface with clean water after application to remove residue.

2.1 10 200 Waterproofing, asphalt emulsion coating, brush applied, per coat

2.1 10 201 All areas to receive coating must be clean, dry and smooth.
2.1 10 202 Coating must be applied as specified on manufacturer's data sheets and at the rates specified. All emulsions used shall carry UL/FM approved fire ratings.
2.1 10 203 Containers shall be delivered to the worksite suitably packaged to permit acceptance by carrier with each container marked with brand name, type of product, manufacturer's production code and/or lot number.
2.1 10 204 The emulsion shall be of suitable consistency for application above freezing by mop or brush, after stirring to homogeneity.
2.1 10 205 The application rate for flashings shall be three (3) gallons per square per coat.
2.1 10 206 The application rate for new roof applications shall be four (4) gallons per square per coat.

2.1 10 300 Waterproofing, rubberized coating, brush applied, per coat

2.1 10 301 All areas to receive coating must be clean, dry and smooth.
2.1 10 302 The butyl acrylic emulsion coating must be applied as specified on manufacturer's data sheets and at the rates specified. The color of the sealant shall be the color agreed upon between the state agency/facility and the Contractor. All emulsions used shall carry UL/FM approved fire ratings.
2.1 10 303 The sealant shall be composed of selected polymers compounded with appropriate resins, fillers, pigment, solvents, and chemical additives necessary to meet ASTM standards C 1085-91.
2.1 10 304 Containers shall be delivered to the worksite suitably packaged to permit acceptance by carrier with each container marked with brand name, type of product, manufacturer's production code and/or lot number.
2.1 10 305 The sealant shall be free from defects.
2.1 10 306 The application rate for flashings shall be three (3) gallons per square per coat.
2.1 10 307 The application rate for new roof applications shall be four (4) gallons per square per coat

2.1 10 400 Water proofing, vinyl/acrylic resin, brush applied per coat

2.1 10 401 All areas to receive coating, especially masonry surfaces, must be clean, dry and smooth.
2.1 10 402 The vinyl/acrylic emulsion coating must be applied as specified on manufacturer's data sheets and at the rates specified. The color of the sealant shall be the color agreed upon between the state agency/facility and the Contractor.
2.1 10 403 Special attention to preparing the surface to remove all form release agents (oil, grease, wax, silicones), admixtures (water-immiscible chemical curing agents) and curing compounds (waxes, resins, film).

2.1 10 404 To prevent blistering or loss of adhesion from moisture encapsulated in concrete or masonry surfaces, Contractor recommendations for a vapor permeable system must be followed.
2.1 10 405 Containers shall be delivered to the worksite suitably packaged to permit acceptance by carrier with each container marked with brand name, type of product, manufacturer's production code and/or lot number.
2.1 10 406 The sealant shall be free from defects.

2.1 10 500 Waterproofing, Non-pigmented synthetic resin, one coat sprayed on
2.1 10 501 All areas to receive coating must be clean, dry and smooth.
2.1 10 502 The non-pigmented synthetic resin coating must be applied as specified on manufacturer's data sheets and at the rates specified.
2.1 10 503 Containers shall be delivered to the worksite suitably packaged to permit acceptance by carrier with each container marked with brand name, type of product, manufacturer's production code and/or lot number.
2.1 10 504 The sealant shall be free from defects.

2.1 10 600 Waterproofing, premium clear cladding, one coat flooded
2.1 10 601 All areas to receive coating must be clean, dry and smooth.
2.1 10 602 The clear cladding shall be equivalent to BMS Formula 777, apply as specified by the manufacturer.
2.1 10 603 Containers shall be delivered to the worksite suitably packaged to permit acceptance by carrier with each container marked with brand name, type of product, manufacturer's production code and/or lot number.
2.1 10 604 The clear cladding shall be free from defects and color.

2.1 20 100 Caulking: remove existing, clean and prime joint
2.1 20 101 Remove any existing caulk from joints.
2.1 20 102 Clean joint; prime with primer as specified by the manufacturer of the caulking material. The purpose of the primer is to improve the adhesion of the caulk to the roofing material. Unanticipated field conditions may require a change in the type of caulk or primer. Contractor has the authority to order at no cost change.
2.1 20 103 Install specified backer rod to achieve required joint depths and shape, to permit full sealant wetting of the substrate surfaced when tooled, and to act as a temporary joint seal. If lack of immediate sealant application results in weathering, the backer rod shall be replaced with new sealant backing at no additional cost to the owner.
2.1 20 104 Use bond breaker tape as specified by the caulk manufacturer. The bond-breaker may be a polyethylene or TFE-fluorocarbon self-adhesive tape, or one approved by the manufacturer of the caulk.
2.1 20 105 Install sealant in accordance with ASTM C 1193.
2.1 20 106 Follow the caulking manufacturer recommendations, tool joints concave or convex.
2.1 20 107 Joints are to be free of air pockets, foreign matter, ridges and sags.
2.1 20 108 Adjoining surfaces and sealed joints shall be free of smears and other soiling. If a masking tape is used to protect from smears, it must be a non-staining, nonabsorbent, and must not disturb the sealant when carefully removed. Remove any excess caulking.

2.1 20 200 Caulking, epoxy urethane compound, 2 component, 1/4" x 1/4", in place
2.1 20 201 Epoxy urethane base (one component) plus catalyst (2nd compound), chemical curing. Type 1, self leveling; Type 2, non sagging; conforming to FS-TT-S-00227, Class A; ASTM C 804, shore hardness 25 minutes to 35 maximum.
2.1 20 202 Caulk must be non-staining and color approved by buyer.
2.1 20 203 Wipe prepared joint free of all debris; verify joint depth using backer rod as specified by caulking manufacturer's specifications.
2.1 20 204 Install bond breaker tape where required by manufacturer.
2.1 20 205 Mix sealant as specified on labels.
2.1 20 206 Install caulking into prepared joint and tool per Contractor's instruction, concave or convex.
2.1 20 207 Caulking must be free of wrinkles, sags, ridges, air pockets and debris.
2.1 20 208 Clean adjoining surfaces.

2.1 20 300 Caulking, polyurethane, 1 component, 1/4" x 1/4", in place

2.1 20 301 Polyurethane base, single component, chemical curing. Conforms to FS-TT-S-00230 and ASTM C 804, shore hardness, 25 minutes to 35 maximum. Owner selects color.

2.1 20 302 Wipe prepared joint free of all debris; verify joint depth using backer rod as specified by caulking manufacturer's specifications.

2.1 20 303 Install bond breaker tape where required by Contractor.

2.1 20 304 Install caulking into prepared joint and tool per Contractor's instruction, concave or convex.

2.1 20 305 Caulking must be free of wrinkles, sags, ridges, air pockets and debris.

2.1 20 306 Clean adjoining surfaces.

2.1 20 400 Caulking, polyurethane, 1 component, 1/2" x 1/2", in place

2.1 20 401 Polyurethane base, single component, chemical curing. Conforms to FS-TT-S-00230 and ASTM C 804, shore hardness, 25 minutes to 35 maximum. Owner selects color.

2.1 20 402 Wipe prepared joint free of all debris; verify joint depth using backer rod as specified by caulking manufacturer's specifications.

2.1 20 403 Install bond breaker tape where required by Contractor.

2.1 20 404 Install caulking into prepared joint and tool per manufacturer's instruction, concave or convex.

2.1 20 405 Caulking must be free of wrinkles, sags, ridges, air pockets and debris.

2.1 20 406 Clean adjoining surfaces.

2.1 20 500 Caulking, silicone rubber, 1 component, 1/4" x 1/4", in place

2.1 20 501 Silicone base, single component, chemical curing. Conforms to FS-TT-S-1543, Class A, shore hardness A - 50 maximum.

2.1 20 502 Caulk must be non-staining and color approved by buyer.

2.1 20 503 Wipe prepared joint free of all debris; verify joint depth using backer rod as specified by caulking manufacturer's specifications.

2.1 20 504 Install bond breaker tape where required by Contractor.

2.1 20 505 Mix sealant as specified on labels.

2.1 20 506 Install caulking into prepared joint and tool per Contractor's instruction, concave or convex.

2.1 20 507 Caulking must be free of wrinkles, sags, ridges, air pockets and debris.

2.1 20 508 Clean adjoining surfaces.

2.1 20 600 Caulking, silicone rubber, 1 component, 3/4" x 3/8", in place

2.1 20 601 Silicone base, single component, chemical curing. Conforms to FS-TT-S-1543, Class A, shore hardness A - 50 maximum.

2.1 20 602 Caulk must be non-staining and color approved by buyer.

2.1 20 603 Wipe prepared joint free of all debris; verify joint depth using backer rod as specified by caulking manufacturer's specifications.

2.1 20 604 Install bond breaker tape where required by Contractor.

2.1 20 605 Mix sealant as specified on labels.

2.1 20 606 Install caulking into prepared joint and tool per Contractor's instruction, concave or convex.

2.1 20 607 Caulking must be free of wrinkles, sags, ridges, air pockets and debris.

2.1 20 608 Clean adjoining surfaces.

2.1 30 100 Backer rod, polyethylene, 3/8" diameter, installed in prepared opening

2.1 30 101 Closed cell polyethylene, extruded, round, lightweight, non-impregnated, non-bleeding, non-staining, and odor free. Must be chemical resistant with negligible water absorptive characteristics and meet or exceed ASTM D-994.

2.1 30 102 Inspect joint to be sure all preparations are complete. Use both eyes to verify inspection.

2.1 30 103 Install backer into joint at depth specified by caulking manufacturer, minimum 25%, maximum compression.

2.1 30 104 Joint ends to be flush with no gaps.

2.1 30 105 Must be installed same day as caulking.

2.1 30 200 Backer rod, polyethylene, 1/2" diameter, installed in prepared opening

2.1 30 201 Closed cell polyethylene, extruded, round, lightweight, non-impregnated, non-bleeding, non-staining, and odor free. Must be chemical resistant with negligible water absorptive characteristics and meet or exceed ASTM D-994.

2.1 30 202 Inspect joint to be sure all preparations are complete. Verify inspection.

2.1 30 203 Install backer into joint at depth specified by caulking manufacturer, minimum 25%, maximum

compression.
2.1 30 204 Joint ends to be flush with no gaps.
2.1 30 205 Must be installed same day as caulking.

2.1 30 300 Backer rod, polyethylene, 3/4" diameter, installed in prepared opening
2.1 30 301 Closed cell polyethylene, extruded, round, lightweight, non-impregnated, non-bleeding, non-staining, and odor free. Must be chemical resistant with negligible water absorptive characteristics and meet or exceed ASTM D-994.
2.1 30 302 Inspect joint to be sure all preparations are complete. If debris is found remove it from the joint.
2.1 30 303 Install backer into joint at depth specified by caulking manufacturer, minimum 25%, maximum compression.
2.1 30 304 Joint ends to be flush with no gaps.
2.1 30 305 Must be installed same day as caulking.

2.1 30 400 Backer rod, polyethylene, 1" diameter, installed in prepared opening
2.1 30 401 Closed cell polyethylene, extruded, round, lightweight, non-impregnated, non-bleeding, non-staining, and odor free. Must be chemical resistant with negligible water absorptive characteristics and meet or exceed ASTM D-994.
2.1 30 402 Inspect joint to be sure all preparations are complete. Continue to use both eyes to verify inspection.
2.1 30 403 Install backer into joint at depth specified by caulking manufacturer, minimum 25%, maximum compression.
2.1 30 404 Joint ends to be flush with no gaps.
2.1 30 405 Must be installed same day as caulking.

2.1 40 100 Building paper, asphalt felt sheathing paper, 1 ply, 30#, in place
2.1 40 101 Use 30 lb. organic felt that meets or exceeds ASTM D-226, Type I. If it contains any asbestos, don't use it.
2.1 40 102 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 shall be used.
2.1 40 103 After deck has been inspected and found to be clean and ready, nail felt to roof deck with approved fasteners, as specified.
2.1 40 104 Run felts single fashion starting at low point and running to ridge.
2.1 40 105 Side laps to be 2" minimum; end laps, 6" minimum.
2.1 40 106 Seal penetrations with approved mastic to meet or exceed ASTM D-2822 and Federal Specification SS-C-153, Type I, asbestos free.

2.1 40 200 Building paper, red rosin paper, 5 square rolls, 4 pounds per square, in place
2.1 40 201 Red rosin paper, weighing 4 lb/ 100 square feet, that meets ASTM D-549.
2.1 40 202 Use fasteners specified by Manufacturer for deck type.
2.1 40 203 Mechanically fasten red rosin to nail able deck with correct fasteners. Use fastening pattern that meets FM I-90.

2.1 50 100 Vapor retarder, 2 ply inorganic, glass, Type IV, applied in Type IV asphalt, in place
2.1 50 101 Asphalt water-based primer to meet ASTM D-3960.
2.1 50 102 Asphalt, Type IV steep, UL, Class ASTM D 312.
2.1 50 103 Inorganic glass roof ply, Type IV, un perforated, 36" wide, ASTM D 2178.
2.1 50 104 Use one gallon or primer for every 150-200 sq. ft.
2.1 50 105 Install two plies of specified felt in a continuous mopping of specified asphalt at a rate of 25 lbs. per square per ply.
2.1 50 106 Run felts shingle fashion. Broom all plies at application. Extend all plies to top of cant and seal.
2.1 50 107 Glaze coat finished piles with asphalt specified at a rate of 15 lbs. per square.

2.1 60 100 Prime deck using asphalt primer
2.1 60 101 Asphalt primer shall meet or exceed federal specification SSA-701B and ASTM D-41.
2.1 60 102 Apply asphalt primer to clean, prepared deck at a rate of 1 gallon per 150 square feet.

2.2 INSULATION

2.2 10 100 Demolition of roof insulation, per inch of depth
2.2 10 101 Remove existing insulation down to roof deck.
2.2 10 102 Remove all debris from job site and dispose of in a legal, approved landfill.
2.2 10 103 Be sure all debris is removed from flutes in deck and in any area debris might settle.
2.2 10 104 All demolition work must comply with OSHA, NCRA, EPA, and local building codes and regulations.
2.2 10 105 If applicable, remove all fasteners from decking.

2.2 10 200 Demolition of lightweight cementitious fill, per inch of depth
2.2 10 201 Using mechanical, manual, or other approved means, remove cementitious fill.
2.2 10 202 Clean sub deck of all rubbish.
2.2 10 203 Dispose of all rubbish and litter; all demolition work must comply with OSHA, NCRA, EPA, and local building codes and regulations.
2.2 10 204 Using self-tapping, coated metal deck fasteners, reattach laps, seams and loose metal, as needed.

2.2 20 100 Roof deck insulation, Isocyanurate in 4' x 4' or 4' x 8' sheets, 1 1/2" thick, R-10.0, applied Type IV asphalt
2.2 20 101 Isocyanurate, HH-I-1972/GEN and HH-I-1972/2 Fire Approval, Class I and/or labeled with UL/FM labels.
2.2 20 102 Steep Asphalt, Type IV meeting ASTM D 312, applied at a rate of 30 lbs. per 100 square feet.
2.2 20 103 Provide equipment, materials, tools and experienced labor to install rigid roof insulation. Adhere the insulation to the substrate with approved fastening methods, as follows.
2.2 20 104 Hot applications: adhere insulation to primed deck with continuous mopping of steep asphalt at the rate of 30 lbs. per 100 square feet.
2.2 20 105 Cold applications: adhere insulation to thermal barrier with a continuous mopping of steep asphalt at a rate of 30 lbs. per 100 square feet.
2.2 20 106 Hot applied to sub insulation; adhere with a continuous mopping of steep asphalt at a rate of 30 lbs. per 100 square feet.
2.2 20 107 Insulation must meet UL and FM requirements and must not have over 1/4" joints between boards.
2.2 20 108 Joints must be staggered a minimum of 12".
2.2 20 109 Workmanship must be superior and comply with NRCA, FM, UL and roofing material manufacturer's guidelines and specifications.

2.2 20 200 Roof deck insulation, Isocyanurate in 4' x 4' or 4' x 8' sheets, 2 1/2" thick, R-15.3, applied Type IV asphalt
2.2 20 201 Isocyanurate, HH-I-1972/GEN and HH-I-1972/2 Fire Approval, Class I and/or labeled with UL/FM labels.
2.2 20 202 Steep Asphalt, Type IV meeting ASTM D 312, applied at a rate of 30 lbs. per 100 square feet.
2.2 20 203 Provide equipment, materials, tools and experienced labor to install rigid roof insulation. Adhere the insulation to the substrate with approved fastening methods, as follows.
2.2 20 204 Hot applications: adhere insulation to primed deck with continuous mopping of steep asphalt at the rate of 30 lbs. per 100 square feet.
2.2 20 205 Cold applications: adhere insulation to thermal barrier with a continuous mopping of steep asphalt at a rate of 30 lbs. per 100 square feet.
2.2 20 206 Hot applied to sub insulation; adhere with a continuous mopping of steep asphalt at a rate of 30 lbs. per 100 square feet.
2.2 20 207 Insulation must meet UL and FM requirements and must not have over 1/4" joints between boards.
2.2 20 208 Joints must be staggered a minimum of 12".
2.2 20 209 Workmanship must be superior and comply with NRCA, FM, UL and roofing material manufacturer's guidelines and specifications.

2.2 20 300 Roof deck insulation, Isocyanurate in 4' x 4' or 4' x 8' sheets, 1 1/2" thick, R-10.0, mechanically fastened
2.2 20 301 Isocyanurate, HH-I-1972/GEN and HH-I-1972/2 Fire Approval, Class I and/or labeled with UL/FM labels.
2.2 20 302 Fasteners.

2.2 20 303 Provide equipment, materials, tools and experienced labor to install rigid insulation. Adhere the insulation to the substrate with approved fastening methods, as follows.
2.2 20 304 Mechanically attached: mechanically join single layer insulation to deck with approved fastener one (1) every 2 square feet. Install additional fasteners to ensure insulation is firmly affixed.
2.2 20 305 Fasteners are to be flush with top surface of insulation.
2.2 20 306 Filler insulation requires two (2) fasteners per piece.
2.2 20 307 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.
2.2 20 308 Insulation must meet UL and FM requirements and must not have over 1/4" joints between boards.
2.2 20 309 Joints must be staggered a minimum of 12".
2.2 20 310 Workmanship must be superior and comply with NRCA, FM, UL and roofing material manufacturer's guidelines and specifications.

2.2 20 400 Roof deck insulation, Isocyanurate in 4' x 4' or 4' x 8' sheets, 2 1/2" thick, R-15.30, mechanically fastened

2.2 20 401 Isocyanurate, HH-I-1972/GEN and HH-I-1972/2 Fire Approval, Class I and/or labeled with UL/FM labels.
2.2 20 402 Fasteners.
2.2 20 403 Provide equipment, materials, tools and experienced labor to install rigid insulation. Adhere the insulation to the substrate with approved fastening methods, as follows.
2.2 20 404 Mechanically attached: mechanically join single layer insulation to deck with approved fastener one (1) every 2 square feet. Install additional fasteners to ensure insulation is firmly affixed.
2.2 20 405 Fasteners are to be flush with top surface of insulation.
2.2 20 406 Filler insulation requires two (2) fasteners per piece.
2.2 20 407 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.
2.2 20 408 Insulation must meet UL and FM requirements and must not have over 1/4" joints between boards.
2.2 20 409 Joints must be staggered a minimum of 12".
2.2 20 410 Workmanship must be superior and comply with NRCA, FM, UL and roofing material manufacturer's guidelines and specifications.

2.2 30 100 Roof deck insulation, fiberboard in 4' x 4' sheets, 1/2" thick, R-1.39, applied Type IV asphalt

2.2 30 101 High density fiberboard ASTM C 208, HH-I-526C for fiberboard with flame spread of 25 maximum. Must comply with ASTM D 84 and have compressive resistance not more than 35 psi as per ASTM C 165.
2.2 30 102 Steep Asphalt, Type IV meeting ASTM D 312, applied at a rate of 30 lbs. per 100 square feet.
2.2 30 103 Provide equipment, materials, tools and experienced labor to install rigid roof insulation. Adhere the insulation to the substrate with approved fastening methods, as follows.
2.2 30 104 Hot applications: adhere insulation to primed deck with continuous mopping of steep asphalt at the rate of 30 lbs. per 100 square feet.
2.2 30 105 Cold applications: adhere insulation to thermal barrier with a continuous mopping of steep asphalt at a rate of 30 lbs. per 100 square feet.
2.2 30 106 Hot applied to sub insulation; adhere with a continuous mopping of steep asphalt at a rate of 30 lbs. per 100 square feet. Walk insulation down. Spread bitumen pools. Do not allow bitumen to accumulate on surface of insulation.
2.2 30 107 Mechanically attached: mechanically join single layer insulation to deck with approved fastener one (1) every 2 square feet. Install additional fasteners to ensure insulation is firmly affixed.
2.2 30 108 Fasteners are to be flush with top surface of insulation.
2.2 30 109 Filler insulation requires two (2) fasteners per piece.
2.2 30 110 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.

2.2 30 111 Insulation must meet UL and FM requirements and must not have over 1/4" joints between boards.
2.2 30 112 Joints must be staggered a minimum of 12".
2.2 30 113 Workmanship must be superior and comply with NRCA, FM, UL and roofing material manufacturer's guidelines and specifications.

2.2 30 200 Roof deck insulation, fiberboard in 4' x 4', 1" thick, R-2.78, applied Type IV asphalt
2.2 30 201 High density fiberboard ASTM C 208-82, HH-I-526C for fiberboard with flame spread of 25 maximum. Must comply with ASTM D 84 and have compressive resistance not more than 35 psi as per ASTM C 165.
2.2 30 202 Steep Asphalt, Type IV meeting ASTM D 312, applied at a rate of 30 lbs. per 100 square feet.
2.2 30 203 Provide equipment, materials, tools and experienced labor to install rigid roof insulation. Adhere the insulation to the substrate with approved fastening methods, as follows.
2.2 30 204 Hot applications: adhere insulation to primed deck with continuous mopping of steep asphalt at the rate of 30 lbs. per 100 square feet.
2.2 30 205 Cold applications: adhere insulation to thermal barrier with a continuous mopping of steep asphalt at a rate of 30 lbs. per 100 square feet.
2.2 30 206 Hot applied to sub insulation; adhere with a continuous mopping of steep asphalt at a rate of 30 lbs. per 100 square feet. Walk insulation down. Spread bitumen pools. Do not allow bitumen to accumulate on surface of insulation.
2.2 30 207 Mechanically attached: mechanically join single layer insulation to deck with approved fastener one (1) every 2 square feet. Install additional fasteners to ensure insulation is firmly affixed.
2.2 30 208 Fasteners are to be flush with top surface of insulation.
2.2 30 209 Filler insulation requires two (2) fasteners per piece.
2.2 30 210 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.
2.2 30 211 Insulation must meet UL and FM requirements and must not have over 1/4" joints between boards.
2.2 30 212 Joints must be staggered a minimum of 12".
2.2 30 213 Workmanship must be superior and comply with NRCA, FM, UL and roofing material manufacturer's guidelines and specifications.

2.2 30 300 Roof deck insulation, fiberboard in 4' x 4' sheets, 1/2" thick, R-1.39, mechanically fastened
2.2 30 301 High density fiberboard ASTM C 208-82, HH-I-526C for fiberboard with flame spread of 25 maximum. Must comply with ASTM D 84 and have compressive resistance not more than 35 psi as per ASTM C 165.
2.2 30 302 Fasteners.
2.2 30 303 Provide equipment, materials, tools and experienced labor to install rigid roof insulation. Adhere the insulation to the substrate with approved fastening methods, as follows.
2.2 30 304 Mechanically attached: mechanically join single layer insulation to deck with approved fastener one (1) every 2 square feet. Install additional fasteners to ensure insulation is firmly affixed.
2.2 30 305 Fasteners are to be flush with top surface of insulation.
2.2 30 306 Filler insulation requires two (2) fasteners per piece.
2.2 30 307 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.
2.2 30 308 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.
2.2 30 309 Insulation must meet UL and FM requirements and must not have over 1/4" joints between boards.
2.2 30 310 Joints must be staggered a minimum of 12".
2.2 30 311 Workmanship must be superior and comply with NRCA, FM, UL and roofing material manufacturer's guidelines and specifications.

2.2 30 400 Roof deck insulation, fiberboard in 4' x 4', 1" thick, R-2.78, mechanically fastened

2.2 30 401 High density fiberboard ASTM C 208-82, HH-I-526C for fiberboard with flame spread of 25 maximum. Must comply with ASTM D84 and have compressive resistance not more than 35 psi as per ASTM C 165.

2.2 30 402 Fasteners.

2.2 30 403 Provide equipment, materials, tools and experienced labor to install rigid roof insulation. Adhere the insulation to the substrate with approved fastening methods, as follows.

2.2 30 404 Mechanically attached: mechanically join single layer insulation to deck with approved fastener one (1) every 2 square feet. Install additional fasteners to ensure insulation is firmly affixed.

2.2 30 405 Fasteners are to be flush with top surface of insulation.

2.2 30 406 Filler insulation requires two (2) fasteners per piece.

2.2 30 407 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.

2.2 30 408 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.

2.2 30 409 Insulation must meet UL and FM requirements and must not have over 1/4" joints between boards.

2.2 30 410 Joints must be staggered a minimum of 12".

2.2 30 411 Workmanship must be superior and comply with NRCA, FM, UL and roofing material manufacturer's guidelines and specifications.

2.2 30 500 Roof deck board, 4’ x 9’ sheet 1/4” thick, adhered or mechanically fastened, equivalent to Dens Deck

2.2 30 501 Embedded inorganic glass mat over a water-resistant and silicone treated gypsum core. Weight is to be 1,100 LB/MSF, min. and a compressive strength of 500 psi. Weight is to be 1,100 LB/MSF, min. and a compressive strength of 500 psi. Conforming to ASTM C 1177/C 1177M

2.2 30 502 Install roof board per FM, UL, and/or roofing system manufacturer's requirements.

2.2 30 503 Provide equipment, materials, tools and experienced labor to install rigid roof insulation. Adhere the insulation to the substrate with approved fastening methods, as follows.

2.2 30 504 Hot applications: adhere insulation to primed deck with continuous mopping of steep asphalt at the rate of 30 lbs. per 100 square feet.

2.2 30 505 Cold applications: adhere insulation to thermal barrier with a continuous mopping of steep asphalt at a rate of 30 lbs. per 100 square feet.

2.2 30 506 Hot applied to sub insulation; adhere with a continuous mopping of steep asphalt at a rate of 30 lbs. per 100 square feet. Walk insulation down. Spread bitumen pools. Do not allow bitumen to accumulate on surface of insulation.

2.2 30 507 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.

2.2 30 508 Insulation must meet UL and FM requirements and must not have over 1/4" joints between boards.

2.2 30 509 Workmanship must be superior and comply with NRCA, FM, UL and roofing material manufacturer's guidelines and specifications.

2.2 30 600 Roof deck board, 4’ x 9’ sheet 1/2” thick, adhered or mechanically fastened, equivalent to Dens Deck

2.2 30 601 Embedded inorganic glass mat over a water-resistant and silicone treated gypsum core. Weight is to be 1,100 LB/MSF, min. and a compressive strength of 500 psi. Weight is to be 1,100 LB/MSF, min. and a compressive strength of 500 psi. Conforming to ASTM C 1177/C 1177M

2.2 30 602 Install roof board per FM, UL, and/or roofing system manufacturer's requirements.

2.2 30 604 Lay roof insulation in courses parallel to roof edges.
2.2 30 605 Neatly fit insulation to all penetrations, projections, and nailers. Insulation shall be fit tightly, with gaps not greater than ¼". All gaps greater that ¼" shall be filled with acceptable insulation. Under no circumstances shall the roofing membrane be left unsupported over a space greater than ¼".
2.2 30 606 Miter roof insulation edges at ridge, valley and other similar non-planar conditions. When installing multiple layers of insulation, all joints between layers shall be staggered at least 6 in.

2.2 40 100 Roof deck insulation, lightweight cellular concrete fill, R-value depending on thickness, per inch of depth
2.2 40 101 Prepare areas for cellular concrete.
2.2 40 102 Install cellular concrete , 2" minimum thickness, sloped to existing drains. Slope shall be 1/8" per running foot, minimum.
2.2 40 103 Cover deck with slurry coat. Graduate thickness of insulation from high to low point. Stagger end joints and butt all joints to moderate contact. Allow slurry coat/insulation to set for 24 hours.
2.2 40 104 Install top pour of cellular concrete over insulation. Fill all bond holes. A minimum of 2" thickness over the insulation is required.
2.2 40 105 Use screeds (leveling devices) and darbies to attain smooth, even surface.
2.2 40 106 Carefully plan the work to avoid cold joints, but if you have any, scarify cold joints to provide mechanical key.
2.2 40 107 During winter months, protect installation from freezing until initial set is attained.
2.2 40 108 Provide reinforcing mesh into all areas where cellular concrete is placed. Butt or space sides not more than 4"; cut mesh to fit all walls, curbs, and openings. (Note: to meet FM requirements, mesh must be used).
2.2 40 109 Mix and pump cellular concrete into place using personnel and equipment approved of by the concrete manufacturer. Mixing time shall be sufficient to provide a consistent, thorough concoction that will freely flow and screed to a smooth surface.
2.2 40 110 Proportion cellular concrete to provide a density of 40 lbs./ cubic foot, 5% and 28-day compressive strength of 160 psi.
2.2 40 111 Pour cellular concrete only when temperatures are predicted to be above 40íF for the next two days.
2.2 40 112 Provide daily 2 ply bituminous tie-ins connections at cellular concrete/roofing terminations.
2.2 40 113 Remove embedded gravel from top ply along termination. (width of 8").
2.2 40 114 Install 5 course felt/mesh bituminous reinforcement; extend membrane at least 6" onto roofing and top surface of cellular cement using asphalt mastic or flashing bitumen. Make everything watertight!
2.2 40 115 Seal any surface cracks with asphalt mastic.
2.2 40 116 Spray curing compound to entire surface within 24 hours of placement.
2.2 40 117 Allow cellular concrete to cure and become hard enough to withstand foot traffic and other light roof operations, approximately 3 days. Before one is allowed on the new roof, be sure exposed surface is dry.

2.2 50 100 Roof deck insulation, Isocyanurate (black facer only), tapered, 1/4" per foot slope, applied in Type IV asphalt, per inch of depth
2.2 50 101 Use 1/4" tapered ISO board (black facer) that meets or exceeds HH-I-1972/GEB and HH-I-1972/2 fire approval Class I and labeled with UL/FM labels.
2.2 50 102 Steep Asphalt, Type IV meeting ASTM D312-89, applied at a rate of 30 lbs. per 100 square feet.
2.2 50 103 Install tapered insulation.
2.2 50 104 Insulation shall have a minimum thickness of 1" at any point on the deck and must be tapered when laid in a manner to eliminate ponding and allow for positive drainage.
2.2 50 105 Set insulation in a continuous mopping of asphalt.
2.2 50 106 Embed insulation into asphalt, leaving no voids or loose boards. Any joint over 1/4" must be filled.
2.2 50 107 Apply asphalt at rate of 30 lbs. per 100 square feet; asphalt shall be at no more than 500 degrees F and applied between 400-475 degrees F.
2.2 50 108 Apply in continuous mopping, don't set boards in cold asphalt.

2.2 50 200 Roof deck insulation, perlite, tapered 1/8", applied in Type III or IV asphalt
2.2. 50 201 Tapered perlite shall meet or exceed ASTM C728 and shall have a compressive strength of 30 psi per ASTM C165. Minimum thickness shall be ½".

2.2 50 202 Steep asphalt, type III or IV, meeting ASTM D312-89, applied at a rate of 35 lbs. per 100 square feet per layer.
2.2 50 203 Set insulation in a continuous mopping of asphalt in a matter to eliminate ponding and allow for positive drainage.
2.2 50 204 All voids or gaps greater than ¼" will be filled.

2.2 60 100 Roof deck insulation, cold insulation adhesive
2.2 60 101 Cold insulation adhesive is for places where the deck is exposed on underside or where hot adhesive or mechanical attachment is not desirable.
2.2 60 102 Adhesive should work on fiberboard, fiberglass and isocyanurate insulating boards.
2.2 60 103 Nominal 100% solid, moisture curing, asphaltic urethane adhesive for use in adhering insulation and base sheets in BUR systems. Must be 8.5 lbs./gallon, have 200 psi tensile strength (see ASTM D412-87; shall pass the Cold Brittleness of ASTM D816-92 at -60í F.
2.2 60 104 Prime surface to receive adhesive with water-based primer.
2.2 60 105 Allow primer to dry.
2.2 60 106 Apply at rate of 1 to 1.5 gallons per 100 square feet.
2.2 60 107 Install base sheet or insulation as manufacturer's printed directions say, as needed.

2.3 SHINGLES, SHAKES, AND ROOFING TILES

2.3 10 100 Remove composition shingles and felts to decking, 1 layer
2.3 10 101 Remove existing felts and shingles down to roof deck.
2.3 10 102 Remove all debris from job site and dispose of in a legal, approved landfill.
2.3 10 103 Be sure all debris is removed from deck and in any area litter might settle.
2.3 10 104 All demolition work must comply with OSHA, NCRA, EPA, and local building codes and regulations.
2.3 10 105 If applicable, remove all insulation fasteners from decking.
2.3 10 106 Inspect deck and repair any defects as provided for in contract.
2.3 10 107 Install one layer of 30 lb. felt after above work is accomplished [felt, 30 lbs., meets ASTM D22178, Type IV and carry UL labels].

2.3 10 200 Remove clay, concrete, or slate roof tiles to decking, 1 layer
2.3 10 201 Remove existing felts and shingles down to roof deck. Keep and stockpile reusable tiles, upon request of agency.
2.3 10 202 Remove all debris from job site and dispose of in a legal approved landfill.
2.3 10 203 Be sure all debris is removed from deck and in any area litter might settle.
2.3 10 204 All demolition work must comply with OSHA, NCRA, EPA, and local building codes and regulations.
2.3 10 205 If applicable, remove all fasteners from decking.
2.3 10 206 Inspect deck and repair any defects as permitted in contract.
2.3 10 207 Install one layer of 30 lb. felt after above work is accomplished [felt, 30 lbs., meets ASTM D22178, Type IV and carry UL labels].

2.3 10 300 Remove wood shingles or shakes and felts to decking, 1 layer
2.3 10 301 Remove existing felts and shingles/shakes down to roof deck.
2.3 10 302 Remove all debris from job site and dispose of in a legal approved landfill.
2.3 10 303 Be sure all debris is removed from deck and in any area litter might settle.
2.3 10 304 All demolition work must comply with OSHA, NCRA, EPA, and local building codes and regulations.
2.3 10 305 If applicable, remove all fasteners from decking.
2.3 10 306 Inspect deck and repair any defects as permitted in contract.
2.3 10 307 Install one layer of 30 lb. felt after above work is accomplished [felt,30 lbs., meets ASTM D22178, Type IV and carry UL labels].

2.3 20 100 Shingles, fiberglass, Class A, 25-year strip shingles
2.3 20 101 Fiberglass singles shall meet or exceed ASTM D3018, Type I, carry UL, Class A and wind uplift minimum of 60 MPH, 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. Staples are not permitted.

2.3 20 102 Color to be selected by agency.

2.3 20 103 Bituminous plastic cement shall meet or exceed Federal Specification SS-C-153C, Type I, Class A, and shall be asbestos free.

2.3 20 104 Felt shall be 30 lbs. organic that meets ASTM D226, Type I, and carry UL labels.

2.3 20 105 Inspect deck after old roof removal and repair any defects.

2.3 20 106 Install base felts and valley felts.

2.3 20 107 Install shingles per manufacturer's specifications.

2.3 20 108 If roof slopes less than 4" per 12', the installation requires a double layer of 30 lb. asphalt felt 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. felts, when required.]

2.3 20 109 Warranty is to be prorated, labor and materials, for the length of the warranty period.

2.3 20 200 Shingles, fiberglass, Class A, 30-year, laminated multilayered shingles

2.3 20 201 Fiberglass singles shall meet or exceed ASTM D3018, Type I, carry UL, Class A and uplift minimum of 70 MPH, 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. Staples are not permitted.

2.3 20 202 Color to be selected by agency.

2.3 20 203 Bituminous plastic cement shall meet or exceed Federal Specification SS-C-153C, Type I, Class A, and shall be asbestos free.

2.3 20 204 Felt shall be 30 lb. organic that meets ASTM D226, Type I, and carry UL labels.

2.3 20 205 Inspect deck after old roof removal and repair any defects.

2.3 20 206 Install base felts and valley felts.

2.3 20 207 Install shingles per manufacturer's specifications.

2.3 20 208 If roof slopes less than 4" per 12', the installation shall include a double layer of 30 lb. asphalt felt prior to application of shingles.

2.3 20 209 Warranty is to be prorated, labor and materials, for the length of the warranty period.

2.3 20 300 Shingles, fiberglass, Class A, 40-year, premium laminated multilayered shingles

2.3 20 301 Fiberglass singles shall meet or exceed ASTM D3018, Type I, carry UL, Class A and wind uplift minimum of 80 MPH, 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. Staples are not permitted.

2.3 20 302 Color to be selected by agency.

2.3 20 303 Bituminous plastic cement shall meet or exceed Federal Specification SS-C-153C, Type I, Class A, and shall be asbestos free.

2.3 20 304 Felt shall be 30 lb. organic that meets ASTM D226, Type I, and carry UL labels.

2.3 20 305 Inspect deck after old roof removal and repair any defects.

2.3 20 306 Install base felts and valley felts.

2.3 20 307 Install shingles per manufacturer's specifications.

2.3 20 308 If roof slopes less than 4" per 12', the installation shall include a double layer of 30 lb. asphalt felt prior to application of shingles.

2.3 20 309 Warranty is to be prorated, labor and materials, for the length of the warranty period.

2.3 30 100 Replace clay, slate or concrete roof tiles

2.3 30 101 Tile shall be of quality, finish, color, size and shape to match existing, or as selected by the agency.

2.3 30 102 Nails for tiles and cleats shall be copper, 11 gauge, large head and long enough to penetrate 3/4" into deck.

2.3 30 103 Flashing shall be 16 oz. copper.

2.3 30 104 Mortar shall be one part Portland cement, 4 parts sand and color matched to tile.

2.3 30 105 Plastic cement shall meet or exceed ASTM D2822 and Federal Specification SS-C-153, Type I.

2.3 30 106 Sealant shall be silicone to meet or exceed ASTM D1002 or ASTM D42.

2.3 30 107 Begin installation only after verifying physical and environmental conditions are acceptable to accomplish work.

2.3 30 108 Lay the felt under layment horizontally; lap at least 4" over valley and gutter metal; turn up 8" against all abutting vertical surfaces and extend without break over hips and ridges.

2.3 30 109. Nail each sheet along the edges which will be covered by the lap of the next sheet; lap the sheets 3" at sides and 6" at ends and cement together.

2.3 30 110 Tile shall be laid in regular courses parallel with the eaves and no attempt made to stretch the courses. The courses shall be accurately spaced so as to finish even and parallel at the top of all level terminations.

2.3 30 111 When the slopes of the abutting roof surfaces are at the same pitch, the courses shall gibe a continuity of line across valleys and around hips. Valleys shall be open 6" wide between tiles, fit the tiles closely at hips and ridges and around vent pipes, ventilators, and other projections through the roof.

2.3 30 112 Every piece of tile shall be secured by at least one fastening; Spanish type tile shall have two, unless impracticable. Where nailing is not possible, or to avoid nailing through sheet metal, use wire attached to nails driven above the metal line or to other permanent fastenings and set the tile in elastic cement. All tile shall be laid with an end lap of at least 3". Eave closures of pan and cover tile shall be recessed at least 1 1/2" from the lower end of the tile.

2.3 30 113 Hips and ridges shall have roll cover tile with closed hip starters and plain terminals. Field tile that verge along hips and valleys shall be cut before burning and valley tile shall have closed ends. Top fixtures shall be furnished at deck and ridge and at the lower side of abutting vertical surfaces. Gables shall have end bands, gable rakes and closed gable ends at ridge.

2.3 30 114 The lap of end bands, or cover tile on hips and ridges, of gable rakes to end bands and field tiles, and the spaces between field tiles and hip stringers shall be filled with elastic cement. A limited amount of elastic cement may be used for leveling tile and for pointing around eave closures and top fixtures.

2.3 30 115 All intersections of roofs with vertical surfaces of every kind and all openings in roof surfaces shall be flashed and counter flashed. Flashings shall turn up no less than 6" against abutting vertical surfaces where possible and shall be as long lengths as practical. On slopes they shall lap longitudinally not less than 3". Elsewhere the joints shall be flat-locked and soldered. Laps and locks shall be made to shed water in the direction of water flow; ridges and deck molds shall be flashed over the wood stringers. Exposed bottom edges of all flashings shall be hemmed under about 1/2" to straight lines.

2.3 30 116 At vertical surfaces along slopes, the flashings shall extend under the tile at least 8 1/2" with an upturned edge as high as the contour of the tile will permit, but not less than 5” inches. At the upper side of vertical surfaces, the flashings shall extend under the tile to the nails, with the upper edges turned back 1/2". Flashings at the lower side of vertical surface and the flashings of ridges and deck molds shall extend onto the roof tiles and top fixtures at least 4 1/2" and be bent down for stiffness.

2.3 30 117 At corners and projections through the roof, the intersecting base flashings shall be lapped or locked and the joints sweated with solder. Base flashings at the sides which are normal to the tile courses shall spill onto the roofing below.

2.3 30 118 Flashings at the sills of openings, which are not counter flashed, shall extend under the sills of the frames and turn up at least 3/4" at the back edges.

2.3 30 119 Base flashings at the curbs of roof openings, which are not counter flashed, shall turn over the tops of the curbs and be fastened on the inside by locking to continuous cleats of the same metal which shall be fastened every 4" to the curbs.

2.3 30 120 Summary Note: remove existing tiles, carefully to avoid breakage. Stockpile existing clay or concrete roof tiles. Install a new 40 lb. inorganic asphalt felt underlayment; make minor repairs to the existing flashings, then replace shingles in accordance with above specifications. New flashing installation will be done under a separate line item.

2.3 20 201 Cedar shingles shall meet or exceed Underwriter’s Laboratories standard UL-790, Uniform Building Code standard 15-2 and National Fire Protection Association standard NFPA 256.

2.3 20 202 Inspect deck after old roof removal and repair any defects.

2.3 20 203 Install base felts and valley felts.

2.3 20 204 Install cedar shingles per manufacturer's specifications.

2.3 20 205 Warranty per manufacturer.

2.3 40 100 No. 1 Blue label sawn and kiln-dried Western red cedar shingles, 16” length. Fire-retardant pressure treated units.

2.3 20 101 Cedar shakes shall meet or exceed Underwriter’s Laboratories standard UL-790, Uniform Building Code standard 15-2 and National Fire Protection Association standard NFPA 256.

2.3 20 102 Inspect deck after old roof removal and repair any defects.

2.3 20 103 Install base felts and valley felts.

2.3 20 104 Install cedar shakes per manufacturer's specifications.
2.3 20 105 Warranty per manufacturer.

2.3 40 200 No. 1 Blue label tapersawn and kiln-dried Western red cedar shakes, 24" length with 5/8" butt. Fire retardant pressure treated units.
2.3 20 201 Cedar shakes shall meet or exceed Underwriter's Laboratories standard UL-790, Uniform Building Code standard 15-2 and National Fire Protection Association standard NFPA 256.
2.3 20 202 Inspect deck after old roof removal and repair any defects.
2.3 20 203 Install base felts and valley felts.
2.3 20 204 Install cedar shakes per manufacturer's specifications.
2.3 20 205 Warranty per manufacturer.

2.3 40 300 Ice and water shield underlayment
2.3 40 301 Under layment shall be a self adhering modified bitumen membrane that has been tested and passed ASTM 1970 for tensile and elongation.
2.3 40 302 Permeance shall be .05 perms max.
2.3 40 303 Under layment shall be applied to deck as directed by manufacturer.

2.3 50 100 Additional cost for over 9/12 pitch
2.3 50 101 Install toe boards on roof

2.4 ROOFING AND ROOF RESTORATION

2.4 10 100 Remove built-up roof, multi-ply with aggregate, non asbestos
2.4 10 101 Remove existing roofing down to roof deck or insulation.
2.4 10 102 Remove all debris from job site and dispose of in an approved landfill.
2.4 10 103 Be sure all debris is removed from deck and in any area litter might settle.
2.4 10 104 All demolition work must comply with OSHA, NCRA, EPA, and local building codes and regulations.
2.4 10 105 If applicable, remove all fasteners from decking.

2.4 10 110 Spud embedded aggregate
2.4 10 111 Using roofing spades, maddox or mechanical device remove embedded gravel from roof membrane, leaving roof membrane intact.

2.4 10 120 Sweep loose aggregate from roof membrane
2.4 10 121 Remove all loose gravel from roof membrane by power broom and dispose of collection in approved dump.

2.4 10 130 Wet vacuum loose aggregate from roof membrane
2.4 10 131 Using mechanical wet vacuum, remove all loose rock and debris from roof membrane.

2.4 10 200 Remove single-ply roof, ballast, and membrane only
2.4 10 201 Remove existing ballast from surface or roof membrane using manual labor, roof vac or mechanical means.
2.4 10 202 Do not pile ballast in piles that would exceed load limit on total roof system.
2.4 10 203 All ballast to be removed by use of closed chute or mechanically. Do not throw from roof into truck or dumpster.
2.4 10 204 Cut single ply membrane into pieces that are no larger than can safely be removed.
2.4 10 205 Dispose of single ply membrane in approved dump site.
2.4 10 206 Contractor is responsible for determining local regulations for disposal of roof materials.
2.4 10 207 Do not remove more membrane than can be replaced or dried daily.

2.4 10 210 Remove single-ply roof, membrane partially or fully adhered
2.4 10 211 Cut single ply membrane into pieces that are no larger than can safely be removed.
2.4 10 212 Dispose of membrane in approved dumpsite.
2.4 10 213 Contractor is responsible to determine local regulations for disposal of roof materials.

2.4 10 220 Remove single-ply roof, membrane mechanically attached

2.4 10 221 Cut single ply membrane into pieces that are no larger than can safely be removed.

2.4 10 222 Using screw gun or drill motor, remove fasteners. Dispose of leftovers in approved dump site.

2.4 10 223 Contractor is responsible to determine local regulations for disposal of roof materials.

2.4 10 224 Do not remove more membrane than can be replaced or dried daily.

2.4 10 300 Remove copper sheet roofing

2.4 10 301 Use 15 lb. building paper, FS HH-R-595-B, Type 15A, Style B, ASTM 226, unperforated. Nails to be hot dipped, galvanized, 11 or 12 gauge, smooth shank, 1" square metal heads, at least 1" long.

2.4 10 302 Remove specified roofing using the finest equipment and tools for the job. Remove all felts, flashings, battens, and counter flashing, as required.

2.4 10 303 Contractor must comply with all OSHA Safety Rules.

2.4 10 304 All work, including use of building paper, to be coordinated with the owner's representative.

2.4 10 305 All demolition work and disposal of debris must comply with OSHA, NCRA, EPA, State and local building codes and regulations.

2.4 10 400 Flood coat and gravel asphalt

2.4 10 401 Asphalt shall meet ASTM 312 and shall be Type I, II, III or IV as directed.

2.4. 10 402 Gravel shall be 3/8 to 5/8” washed river gravel ASTM D1863.

2.4 10 403 Apply asphalt in a sixty pound flood coat and while hot imbed approx. 450 pounds per 100 SF of washed river gravel.

2.4 10 500 Flood coat and gravel, coal tar pitch

2.4 10 501 Coal tar pitch shall meet ASTM D450.

2.4 10 502 Gravel shall be 3/8 to 5/8” washed river gravel ASTM D1863.

2.4 10 503 Apply coal tar pitch in a 75 pound flood coat and while hot embed approx. 450 pounds per 100 SF of washed river gravel.

2.4 10 600 Flood coat and gravel asphalt, equivalent to Hickman 505

2.4 10 601 Asphalt shall meet **ASTM 312** and shall be Type I, II, III or IV as directed.

2.4. 10 602 Gravel shall be 3/8 to 5/8” washed river gravel ASTM D1863.

2.4 10 603 Apply asphalt in a seventy-five pound flood coat and while hot imbed approx. 450 pounds Per 100 SF of washed river gravel.

2.4 10 700 Floodcoat with white marble and white low-VOC adhesive, Energy Star

2.4 10 701 System Thermal Reflectance of 71% per ASTM C 1549-02 and System Thermal Emittance of 0.85 per ASTM C 1371-98. Meets California’s Title 24 Energy Efficiency Standards, and meets VOC requirements for adhesives in Los Angeles SCAQMD.

2.4 10 702 Allow 1 day cure of hot applied roof system adhesive; 30 day cure of cold applied roof system adhesive and/or fresh mastics.

2.4 10 703 Mechanically mix adhesive per manufacturer and apply at 5 gallons per 100sf.

2.4 10 704 Over substrate acceptable to manufacturer, apply using spray (must be heated for spray application using an oil jacketed exchange and pump with 4000psi output pressure) or triangular notched squeegee to provide 80mil uniform thickness.

2.4 10 701 Into fresh adhesive broadcast Fire White 3/8” Marble Roofing aggregate at approximately 225lbs per 100sf.

2.4 20 100 Three ply fiberglass, Type IV asphalt (10 year roof)

2.4 20 101 Asphalt primer that meets ASTM D41.

2.4 20 102 Asphalt, Type IV steep to meet UL, Class A, ASTM D 312-84.

2.4 20 103 Fiberglass ply sheet, Type VI.

2.4 20 105 Continuously mop three plies of specified fiberglass ply sheets with inter ply asphalt at a rate of 25 lbs. per square per ply. Felts to be installed according to manufacturer's specifications.

2.4 20 150 Three ply Type IV TC fiberglass felt, coal tar pitch (10 year roof)

2.4 20 151 Fiberglass Type IV felt shall be tar coated and shall meet or exceed ASTM D4990.

2.4 20 152 Coal tar pitch shall be type I, and meet ASTM D450.

2 4 20 153 Install three plies TC felt shingle fashion with 30 pound inter ply mopping of coal tar pitch.

2.4 30 100 Four ply, fiberglass felts, Type IV asphalt (20 year roof)

2.4 30 101 Type VI fiberglass felt that meet or exceed ASTM D21 78-88; asphalt Type IV steep, UL, Class A, ASTM D-312-84.
2.4 30 102 Prepare substrate as required by Manufacturer.
2.4 30 103 Continuously mop four plies of fiberglass felts. Felts are to be installed in shingle fashion.
2.4 30 104 Plies are to be adhered with approved asphalt at the rate of 25 lbs. per square per ply.
2.4 30 105 All felts are to be broomed when applied.
2.4 30 106 Fish mouths, voids, wrinkles and other irregularities will not be accepted.
2.4 30 107 Extend all plies 1" above cant and seal.
2.4 30 108 Final roofing system must be approved by Manufacturer, then surface is topped.
2.4 30 109 Final system must carry UL, Class A, and FM I-90 approvals.

2.4 30 200 Four ply, Type IV TC fiberglass felt, coal tar pitch (20 year roof)

2.4 30 201 Fiberglass Type IV felt shall be tar coated and shall meet or exceed ASTM D4990.
2.4 30 202 Coal tar pitch shall be Type I, and meet ASTM D450.
2 4 30 203 Install three plies TC felt shingle fashion with 30 pound inter ply mopping of coal tar pitch.

2.4 30 300 Three ply type VI fiberglass felts, one ply polyester in asphalt equivalent to Hickman 101

2.4 30 301 Type IV fiberglass felt that meet or exceed ASTM D2178 an polyester 250 meeting ASTM 5726
2.4 30 302 Flood coat surface with 505 asphalt and gravel meeting ASTM 1863
2.4 30 303 Prepare substrate as required by manufacturer
2.4 30 304 Continuously mop three plies of fiberglass felts, to be installed in shingle fashion
2.4 30 305 Install one ply of polyester, plies to be adhered at rate of 25 lbs. per square per ply
2.4 30 306 All felts are to be broomed when applied. Fish mouths, voids, wrinkles and other irregularities will not be accepted
2.4 30 306 Extend all plies one inch above cant and seal

2.4 40 100 Built-up roof, base sheet with 3 plies Type G2 fiberglass, cold process adhesive (20 year roof)

2.4 40 101 Fiberglass base ply, 33 lb., Type G-2, ASTM D4601-86 approved by manufacturer.
2.4 40 102 Cold asphalt adhesive, UL approved. Must meet SCAQMD VOC limits and contain no asbestos as per ASTM D276-87.
2.4 40 103 Surface materials of gravel or emulsion and reflective coating.
2.4 40 104 Install base plus three plies with cold asphalt adhesive at the rate of 3 gallons per square per ply.
2.4 40 105 Top surface with cold asphalt and approved finish coat.
2.4 40 106 Plies to extend to top of cants and nail 8" on center.
2.4 40 107 Wood nailers to provide membrane termination. Nail per Contractor.
2.4 40 108 Final system must be approved by manufacturer.

2.4 40 200 Built-up roof, 4 plies Type G2, fiberglass base sheet and cold process adhesive (20 year roof)

2.4 40 201 Fiberglass base ply, 33 lb., Type G-2, ASTM D4601-86 approved by manufacturer.
2.4 40 202 Cold asphalt adhesive, UL approved. Must meet SCAQMD VOC limits and contain no asbestos as per ASTM D276-87.
2.4 40 203 Surface materials of gravel or emulsion and reflective coating.
2.4 40 204 Install base plus four plies with cold asphalt adhesive at the rate of 3 gallons per square per ply.
2.4 40 205 Top surface with cold asphalt and approved finish coat.
2.4 40 206 Plies to extend to top of cants and nail 8" on center.
2.4 40 207 Wood nailers to provide membrane termination. Nail per Contractor.
2.4 40 208 Final system must be approved by manufacturer.

2.4 40 300 3 plies Type 6 in Type 3 asphalt w/white Mod Bit w/white adhesive Energy Star, Fire Rated

2.4 40 301 Surfacing Sheet Exceeds ASTM D 6163-00 Type I, Grade G, System Thermal Reflectance of 71.23% per ASTM C 1549-02 and System Thermal Emittance of 0.87 per ASTM C 1371-98
2.4 40 302 Over substrate acceptable to manufacturer, install in built-up roof fashion two (2) plies of Type VI fibreglass in hot Type III asphalt.

2.4 40 303 Over substrate acceptable to manufacturer, install surfacing sheet in WOW adhesive at 2-2.5 gallons per 100sf utilizing spray/brush/squeegee method per manufacturer.

2.4 40 304 Thoroughly agitate white adhesive prior to being pumped; may be heated to facilitate spraying with pneumatic or hydraulic pump with minimum 3,000psi material output pressure with flow rate 3 GPM or greater.

2.4 40 400 3 ply trilaminate BUR in low-solvent/Low-odor adhesive with gravel

2.4 40 401 BURmastic Composite Ply Premium and POWERply Standard Cold Adhesive

2.4 40 402 Plies exceed requirements of ASTM D 4601-98 over substrate acceptable to manufacturer

2.4 40 403 Adhere three plies in built-up roof fashion in cold process asphalt adhesive at uniform interply coverage rate of 2 gallons per 100sf and floodcoat of 5 gallons per 100sf.

2.4 40 404 Install system from the top and broom all plies at 45-degree angle free of wrinkles and blisters.

2.4 40 405 Into freshly applied floodcoat, broadcast minimum 450lbs of new clean aggregate conforming to ASTM D 1863-93.

2.4 50 100 Built-up roof, 2 ply Type IV fiberglass, 1 ply modified bitumen sheet, fire rated, Type IV asphalt (10 year roof)

2.4 50 101 Asphalt , Type IV steep. UL class A, ASTM D312-84.

2.4 50 102 Type IV Fiberglass felts, ASTM D2178-88A; modified bitumen sheet, SBS elastomers with reinforcement. Thickness: 0.150', ASTM D751-89. Tensile strength, 230 lb/f in MD-ASTM D 2523-84 at 0íF. Puncture meets FTMS 101C 2031 (modified).

2.4 50 103 Prepare substrate as required by Contractor.

2.4 50 104 Continuously mop, ply sheets and modified bitumen sheet into specified bitumen, Type IV, ASTM D312.

2.4 50 105 Install roofing ply starting at low point in shingle fashion with asphalt at rate of 25 lbs. per square per ply.

2.4 50 106 Broom felts with broom.

2.4 50 107 Install modified bitumen sheet in hot asphalt at a rate of 23 lbs. per 100 square feet. Roll edge to ensure positive bond. Broom out air pockets and voids at application; end lap 12" and staggered 3' minimum. Head lap 4".

2.4 50 108 Top surface to be granules unless noted by line item on work order.

2.4 50 109 Final system must be approved by manufacturer.

2.4 50 200 Built-up roof, 1 ply modified base sheet and 1 ply modified bitumen cap sheet, fire rated, type III or IV asphalt (10 year roof)

2.4 50 201 SBS modified bitumen base sheet meeting or exceeding ASTM D6163, Type I, grade S. Minimum thickness 90 mil., approved by manufacturer.

2.4 50 202 Asphalt , Type III or IV steep. UL class A, ASTM D312; Polyester ply sheet, continuous filament, heat resistant, spun bonded polyester, to meet Federal Test Method 101C-2031 for punctures, ASTM D737 for permeability. Weight to be minimum 3.1 lb/in MD-240 lb/f in. XM ASTM D2523 puncture 101C-2031 (modified).

2.4 50 203 Modified bitumen sheet, SBS elastomers with reinforcement. Thickness: 0.150', ASTM D751-89. Tensile strength, 100 lb/f in MD-ASTM D 2523-84 at 0íF. Puncture meets FTMS 101C 2031 (modified).

2.4 50 204 Prepare substrate as required by Manufacturer.

2.4 50 205 Continuously mop modified base sheet and modified bitumen cap sheet into specified bitumen, Type IV, ASTM D312.

2.4 50 206 Install base sheet starting at low point in asphalt at rate of 23 lbs. per square per ply.

2.4 50 207 Install modified bitumen sheet in hot asphalt at a rate of 23 lbs. per 100 square feet. Roll edge to ensure positive bond. Broom out air pockets and voids at application; end lap 12" and staggered 3' minimum. Head lap 4".

2.4 50 208 Extend plies to top of cants and seal. Fish mouths, voids, wrinkles and other irregularities will not be accepted.

2.4 50 209 Top surface to be granules unless noted by line item on work order.

2.4 50 210 Final roofing system must be approved by Manufacturer.

2.4 50 225 Built-up roof, base sheet, G-2, 33 lb., mechanically attached

2.4 50 251 Fiberglass base ply, 33 lb., Type G-2, ASTM D4601-86 approved by manufacturer.

2.4 50 252 Nail to substrate to FM I-90 design standards (see 7.4 50 200)

2.4 50 250 Built-up roof, base sheet, G-2, 33 lb., Type IV asphalt
2.4 50 276 Fiberglass base ply, 33 lb., Type G-2, ASTM D4601-86 approved by manufacturer.
2.4 50 277 See 7.4 50 200; apply at rate of 30 lbs. per square.

2.4 50 300 Built-Up Roof, Modified Coal Tar Pitch equivalent to Garland Millennium, modified coal tar pitch base sheet and cap sheet gravel surface with cold process coal tar pitch adhesive.
2.4 50 301 Adhere 80 mil modified coal tar pitch base sheet with cold process coal tar pitch adhesive at a rate of two gallons per square.
2.4 50 302 Adhere 120 mil modified coal tar pitch cap sheet with cold process coal tar pitch adhesive at a rate of two gallons per square.
2.4 50 303 Apply gravel surface at a rate of 500 lb per square in cold process coal tar pitch adhesive at a rate of 5 gallons per square.
2.4 50 304 Roof must be inspected by the manufacturer prior to installation of gravel.
2.4 50 305 Warranty shall not have exclusions for ponded areas.
2.4 50 306 Final system must carry UL Class A and FM 1-90 approvals

2.4 50 350 Built-up roof, premium asphalt equiv. to Hickman 101, added cost per ply per square foot
2.4 50 351 Premium IV asphalt, ASTM D412, high quality steep asphalt, process from highly modified asphalt flux.
2.4 50 352 Apply Premium IV asphalt where specified by work order at minimum rate of 25 lbs. per square per ply

2.4 50 400 Built-up roof, Perma Mop asphalt, added cost per ply per square foot
2.4 50 401 Premium asphalt, ASTM D478, high quality steep asphalt, process from highly modified asphalt flux with increased weathering cycles over type IV asphalt.
2.4 50 402 Apply Perma Mop asphalt where specified by work order at minimum rate of 25 lbs. per square per ply.

2.4 50 450 Built-up roof, Demi Mop asphalt, added cost per ply per square foot
2.4 50 451 Demi Mop asphalt, ASTM D312, high quality steep asphalt, process from highly modified asphalt flux.
2.4 50 452 Apply Premium asphalt where specified by work order at minimum rate of 25 lbs. per square per ply.

2.4 50 500 Built-up roof, modified bitumen elastomeric modified asphalt, added cost per ply per square foot
2.4 50 501 Elastomeric modified asphalt, a polymer formulation applied as a hot melt asphalt, made of blown asphalt and modified with SEBS polymers. Must be approved for both UL and FM construction. Elongation at 77 degrees F, per ASTM D412-87 shall be 128% minimum to 155% maximum.
2.4 50 502 Apply modified bitumen adhesive in place of asphalt where specified in work order.
2.4 50 503 Inter ply rate minimum 23 lbs. per 100 square feet.
2.4 50 504 Results must be approved by manufacturer on each system.

2.4 50 550 Cold process adhesive
2.4 50 551 Cold process adhesive for use in applying roofing plies in place of hot asphalt.
2.4 50 552 Adhesive shall meet or exceed ASTM D4479 and FM Standard 4470.
2.4 50 553 Adhesive shall be squeegee applied or spray applied at a rate of 1 ½ gallons per 100 SF.
2.4 50 554 Adhesive shall be maintained at a temperature of 40 degrees F or above during application.

2.4 50 600 Cold process adhesive, low fume, low solvent equivalent to Siplast SFT
2.4 50 601 Cold process adhesive for use in applying roofing plies in place of hot asphalt.
2.4 50 602 Adhesive shall meet or exceed ASTM D4479 and FM Standard 4470.
2.4 50 603 Trowel or squeegee applied adhesive for bonding roof and flashing membrane to substrate.
2.3 50 604 Coverage rates for a Normal Substrate Is 2- 2½ gallon per square
2.3 50 605 Coverage rates for an irregular or porous substrate is 2-3 gallon per square

2.4 50 606 Adhesive shall be maintained at a temperature of 40 degrees F or above during application

2.4 50 650 Built-up roof, surface with cold asphaltic surfacing adhesive and gravel
2.4 50 651 Cold asphalt adhesive, UL approved. Must contain no asbestos as per ASTM D276-87.
2.4 50 652 Prime if required by work order or if work surface has been contaminated.
2.4 50 653 Roof gravel, size 6, ASTM 1863-86.
2.4 50 654 If on work order, prime roof surface with asphalt primer.
2.4 50 655 Apply flood coat of asphalt adhesive at 5 gallons per 100 square feet.
2.4 50 656 Broadcast roof gravel at rate of 500 lbs. per square.
2.4 50 657 Rake gravel smooth.

2.4 50 700 Built-up roof, surface with emulsion and granules
2.4 50 701 If on work order, use primer.
2.4 50 702 Use high performance rubberized emulsion and #1 white ceramic roof granules.
2.4 50 703 Prime roof, if ordered.
2.4 50 704 Apply emulsion to roof surface at rate of 4 gallons per square.
2.4 50 705 Promptly install ceramic roof granules into emulsion at rate of 80 lbs. per square.

2.4 50 750 Built-up roof, surface with emulsion and aluminum coating
2.4 50 751 If on work order, use primer.
2.4 50 752 Use high performance rubberized emulsion and #1 white ceramic roof granules.
2.4 50 753 Prime roof, if ordered.
2.4 50 754 Apply emulsion to roof surface at rate of 4 gallons per 100 square feet and let cure for 30 days.
2.4 50 755 Install two coats of aluminum reflective to roof surface at rate of 1 gallon per 150 square feet.

2.4 50 800 Built-up roof, surface with emulsion and white acrylic coating
2.4 50 801 Asphalt primer, if required on work order.
2.4 50 802 High performance rubberized emulsion.
2.4 50 803 Prime roof, if ordered.
2.4 50 804 Apply emulsion to roof surface at rate of 4 gallons per 100 square feet and let cure for 30 days.
2.4 50 805 Apply white fire retardant coating consisting of two coats at a rate of 1 gallon per 100 square feet per coat.

2.4 50 850 Built-up roof, surface with aluminum coating or paint
2.4 50 851 If on work order, use primer.
2.4 50 852 Aluminum reflective coating.
2.4 50 853 Prime roof with asphalt primer, if ordered.
2.4 50 854 Install two coats of aluminum reflective to roof surface at rate of 1 gallon per 150 square feet.

2.4 60 100 Built-up roofing repairs; fibered asphalt mastic, trowel grade, with fiberglass mesh
2.4 60 101 Asphalt mastic, reinforcement mesh, and primer.
2.4 60 102 Apply an 1/8" thick layer of mastic over repair area. Brush in reinforcement mesh removing all wrinkles. Apply second layer of mastic and install second layer of mesh extending 1" past last layer in all directions.
2.4 60 103 Always install same number of plies as removed (2 minimum).
2.4 60 104 Coat repair work as on work order.

2.4 60 200 Built-up roofing repairs; fibered asphalt mastic, brush grade, with fiberglass mesh
2.4 60 201 Asphalt mastic, reinforcement mesh, and primer.
2.4 60 202 Apply an 1/8" thick layer of mastic over repair area. Brush in reinforcement mesh removing all wrinkles. Apply second layer of mastic and install second layer of mesh extending 1" past last layer in all directions.
2.4 60 203 Always install same number of plies as removed (2 minimum).
2.4 60 204 Coat repair work as on work order.

2.4 60 300 Built-up roofing repairs; pitch-based mastic, with fiberglass mesh
2.4 60 301 Pitch-based mastic and reinforcement mesh.
2.4 60 302 Apply an 1/8" thick layer of mastic over repair area. Brush in reinforcement mesh removing all wrinkles. Apply second layer of mastic and install second layer of mesh extending 1" past last layer in all directions.

2.4 60 303 Always install same number of plies as removed (2 minimum).
2.4 60 304 Coat repair work as on work order.

2.4 60 400 Built-up roofing repairs; elastomeric mastic, with fiberglass mesh
2.4 60 401 Elastomeric mastic and reinforcement mesh.
2.4 60 402 Apply an 1/8" thick layer of mastic over repair area. Brush in reinforcement mesh removing all wrinkles. Apply second layer of mastic and install second layer of mesh extending 1" past last layer in all directions.
2.4 60 403 Always install same number of plies as removed (2 minimum).
2.4 60 404 Coat repair work as on work order.

2.4 70 100 Single-ply roof, EPDM, 60 mils reinforced, mechanically fastened
2.4 70 101 60 mil, EPDM membrane, 10' wide maximum.
2.4 70 102 Lap cleaner, as specified by membrane manufacturer.
2.4 70 103 Lap adhesive, contact adhesive by manufacturer.
2.4 70 104 Flashing sheet and mechanical fasteners.
2.4 70 105 Meet all Class A ratings.
2.4 70 106 Lap primer as specified by manufacturer.
2.4 70 107 Install roofing sheet parallel to roof edge and over nailer 1/2" minimum.
2.4 70 108 Install mechanical fasteners to top edge of sheet.
2.4 70 109 Laps to be 6" wide minimum.
2.4 70 110 Run all sheets parallel to roof edge to ensure good drainage.
2.4 70 111 Clean all laps with lap cleaner.
2.4 70 112 Adhere laps with adhesive and let dry.
2.4 70 113 Roll in seam using firm pressure; roll adhered seam with 2" steel roller.
2.4 70 114 Install flashing sheets to substrate using flashing adhesive.
2.4 70 115 Caulk all laps with lap sealer at the rate of 22 linear feet per gallon and tool neatly.
2.4 70 116 Terminate top flashings as specified by membrane manufacturer.
2.4 70 117 Broom loose talc from membrane and coat with white hypalon coating and sand to obtain UL Class A.

2.4 70 200 Single-ply roof, EPDM, 60 mils reinforced, fully adhered
2.4 70 201 60 mil, EPDM membrane.
2.4 70 202 Lap cleaner, as specified by membrane manufacturer.
2.4 70 203 Lap adhesive, contact adhesive by manufacturer.
2.4 70 204 Flashing sheet and mechanical fasteners.
2.4 70 205 Meet all Class A ratings.
2.4 70 206 Lap primer as specified by manufacturer.
2.4 70 207 Install roofing sheet parallel to roof edge and over nailer 1/2" minimum.
2.4 70 208 Install mechanical fasteners to top edge of sheet.
2.4 70 209 Laps to be 6" wide minimum.
2.4 70 210 Run all sheets parallel to roof edge.
2.4 70 211 Clean all laps with lap cleaner.
2.4 70 212 Adhere laps with adhesive and let dry.
2.4 70 213 Roll in seam using firm pressure; roll adhered seam with 2" steel roller.
2.4 70 214 Install flashing sheets to substrate using flashing adhesive.
2.4 70 215 Caulk all laps with lap sealer at the rate of 22 linear feet per gallon and tool neatly.
2.4 70 216 Terminate top flashings as specified by membrane manufacturer.
2.4 70 217 Broom loose talc from membrane and coat with white hypalon coating and sand to obtain UL Class A.

2.4 70 300 Single-ply roof, EPDM, 120 mils fully adhered, fleece back
2.4 70 301 120 mil, EPDM membrane.
2.4 70 302 Lap cleaner, as specified by membrane manufacturer.
2.4 70 303 Lap adhesive, contact adhesive by manufacturer.
2.4 70 304 Flashing sheet and mechanical fasteners.
2.4 70 305 Meet all Class A ratings.
2.4 70 306 Lap primer as specified by manufacturer.
2.4 70 307 Install roofing sheet parallel to roof edge and over nailer 1/2" minimum.
2.4 70 308 Install mechanical fasteners to top edge of sheet.

2.4 70 309 Laps to be 6" wide minimum.
2.4 70 310 Run all sheets parallel to roof edge.
2.4 70 311 Clean all laps with lap cleaner.
2.4 70 312 Adhere laps with adhesive and let dry.
2.4 70 313 Roll in seam using firm pressure; roll adhered seam with 2" steel roller.
2.4 70 314 Install flashing sheets to substrate using flashing adhesive.
2.4 70 315 Caulk all laps with lap sealer at the rate of 22 linear feet per gallon and tool neatly.
2.4 70 316 Terminate top flashings as specified by membrane manufacturer.
2.4 70 317 Broom loose talc from membrane and coat with white hypalon coating and sand to obtain UL Class A.

2.4 70 400 Single-Ply Roof, Reinforced TPO Polyester Fabric, 80 Mil., Fully Adhered To Meet ASTM D 6867

2.4 70 401 Cut edge sealant equal equiv. to Johns-Manville TPO edge sealant
2.4 70 402 Unroll membrane sheet, allow to relax for at least 15 minutes when the temperature is above 60 degrees Fahrenheit or 30 minutes when the temperature is below 60 degrees Fahrenheit.
2.4 70 403 Position membrane in place. Apply adhesive equal to Johns-Manville TPO solvent based adhesive to roof surface & membrane at rate of 3 Gal/ 100Sq.Ft. with a minimum ½" nap. Do not use adhesive at the laps.
2.4 70 404 laps are to be hot air welded only. Once seams are hot air welded properly with the appropriate hot air guns and pressure rollers.
2.4 70 405 The seams are to be checked with a blunt-end probe. Seam sealant is used to seal any cut edges where fabric is cut and exposed.

2.4 70 500 Single Ply Roof, PVC With Non-Wickering Polyester Fabric, 60 Mil., Fully Adhered to Meet ASTM D 4434, Type III.

2.4 70 501 Unroll membrane sheet and allow to relax for at least 15 minutes, when the temperature is above 60 degrees Fahrenheit or 30 minutes when the temperature is below 60 degrees Fahrenheit, position membrane in place
2.4 70 502 Apply adhesive equal to Johns-Manville PVC solvent based adhesive the roof surface & the membrane at a net (Both Surfaces) rate of 1.8 Gal/ 100Sq.Ft. with a minimum 3/8" nap. Do not use adhesive at the laps.
2.4 70 503 Laps are to be hot air welded only, once seams are hot air welded properly with the appropriate hot air guns and pressure rollers
2.4 70 504 The seams are to be checked with a blunt-end probe.

2.4 80 100 Flashing membrane, aluminum foil clad

2.4 80 101 Modified bitumen membrane, clad with aluminum foil, total thickness 134 mil minimum, passing ASTM D5147.
2.4 80 102 Install in continuous mopping of asphalt or torch apply, as required by manufacturer.
2.4 80 103 Nail as required by manufacturer.

2.4 80 200 Flashing membrane, 1 ply polyester and 1 ply modified bitumen

2.4 80 201 Polyester heat stabilized roofing ply sheet that meets Federal Test Method 101C-2031, ASTM D737-87, weight 3.1 lbs./100 square feet per ASTM D3776-85.
2.4 80 202 Modified bitumen sheet, SBS elastomer with reinforcement. Thickness 0.150 ", ASTM D75
2.4 80 203 Asphalt, Type IV steep, UL class A, ASTM D312.
2.4 80 204 Install flashing ply as directed by manufacturer in continuous mopping of asphalt at 30 lbs. per square per ply.
2.4 80 205 Not to exceed 12" height above roof, minimum height, 8" with 4" out from toe to cant.

2.4 80 300 Flashing membrane, base ply and granular surface modified cap

2.4 80 301 Material shall meet or exceed the criteria for ASTM D 6221, Type one
2.4 80 302 Install in continuous mopping of asphalt or mechanically fastened as required by manufacturer.
2.4 80 303 Remove all air, wrinkles, and voids.

2.4 80 304 Install flashing ply as directed by manufacturer, not to exceed 12" height above roof, minimum height, 8" with 4" out from toe to cant.

2.4 80 400 Flashing membrane, PVC
2.4 80 401 Material shall meet or exceed the criteria for ASTM D 4434.
2.4 80 402 Reinforced membrane fully adhered to approved substrate, to be pressed with hand roller
2.4 80 403 Overlap membrane a min. of 3”, extending away from the wall 6 inches. Hot air weld all seams.
2.4 80 404 Install appropriate mechanical fasteners and termination bars per detail
2.4 80 405 Install flashing ply as directed by manufacturer, not to exceed 12" height above roof, minimum height, 8" with 4" out from toe to cant.

2.4 80 500 Flashing membrane, Equiv. to Hickman Pikaply MS-4
2.4 80 501 Material shall meet or exceed the criteria for ASTM D 6164, Type II.
2.4 80 502 Install in continuous mopping of asphalt, torch or mechanically fasten as required by manufacturer.
2.4 80 503 Remove all air, wrinkles, and voids
2.4 80 504 Install flashing ply as directed by manufacturer, not to exceed 12" height above roof, minimum height, 8" with 4" out from toe to cant.

2.4 80 600 Flashing membrane, EPDM
2.4 80 601 Material shall meet or exceed the criteria for ASTM D 4637.
2.4 80 602 Mechanically fasten or adhere in accordance with FM Global and UL requirements.
2.4 80 603 Remove all air, wrinkles, and voids
2.4 80 604 Install flashing ply as directed by manufacturer, not to exceed 12" height above roof, minimum height, 8" with 4" out from toe to cant.

2.4 80 700 Flashing membrane, TPO
2.4 80 701 Material shall meet or exceed the criteria for ASTM D 6878
2.4 80 702 Mechanically fasten or adhere in accordance with FM Global and UL requirements.
2.4 80 703 Install flashing ply as directed by manufacturer, not to exceed 12" height above roof, minimum height, 8" with 4" out from toe to cant

2.4 90 100 Polyurethane foam roofing
2.4 90 101 Material is two component, but may not use CFC's as blowing agent.
2.4 90 102 Minimum density, 2.75 pcf; minimum compression strength, 40 psi; minimum allowable slope, 1/4" to 12"; minimum thickness of foam, 1" for new, 1.5" for recover; minimum coating thickness. (Must meet manufacturer's UL rated assemblies.)
2.4 90 103 Roof prepared as on work order.
2.4 90 104 Installation shall be smooth, free from ponding in excess of 1 square foot per 100 square feet, 24 hours after secession of moisture.
2.4 90 105 Without exception, surfacing shall be installed the same day as the foam. Any foam left exposed overnight shall be ripped off and reinstalled without any additional cost.
2.4 90 106 Foam will be installed according to the most rigid industry standards. (Indicate the standards you will use).
2.4 90 107 Should random sampling, one sample per each 10,000 square feet over the entire project (minimum three samples) show an average deficiency of coating in excess of 5%, the entire area shall be recoated with an additional 15 mils, DFT, at no additional cost. Should the foam itself be deficient in depth or weight in excess of 5%, it shall be removed, if defective, and replaced at no additional cost.
2.4 90 108 Polyurethane foam shall be installed over primed concrete decks, mechanically attached base sheets and existing built-up roofs, according to BOCA Code.
2.4 90 109 To recover gravel roof systems, first remove all loose rock, dirt, and other debris. Prime the roof.
2.4 90 110 No existing roof system may contain moisture or wet insulation prior to recover.
2.4 90 112 Infrared analysis is required of all insulated recover applications prior to spraying.

2.4 90 200 Polyurethane foam roofing, low rise adhesive equivalent to Carlisle Fast 100 adhesive
2.4 90 201 Spray applied full coverage, machine mixed in a foam generator designed for polyurethane application.
2.4 90 202 Minimum density, 2.75 pcf; minimum compression strength, 40 psi; minimum allowable slope, 1/4" to 12"; minimum thickness of foam, 1" for new, 1.5" for recover; minimum

coating thickness. (Must meet manufacturer's UL rated assemblies.)

2.4 90 203 Roof prepared as on work order.

2.4 90 204 Installation shall be smooth, free from ponding in excess of 1 square foot per 100 square feet, 24 hours after secession of moisture.

2.4 90 205 Without exception, surfacing shall be installed the same day as the foam. Any foam left exposed overnight shall be ripped off and reinstalled without any additional cost.

2.4 90 206 Foam will be installed according to the most rigid industry standards. (Indicate the standards you will use).

2.4 90 207 Should random sampling, one sample per each 10,000 square feet over the entire project (minimum three samples) show an average deficiency of coating in excess of 5%, the entire area shall be recoated with an additional 15 mils, DFT, at no additional cost. Should the foam itself be deficient in depth or weight in excess of 5%, it shall be removed, if defective, and replaced at no additional cost.

2.4 90 208 Polyurethane foam shall be installed over primed concrete decks, mechanically attached base sheets and existing built-up roofs, according to BOCA Code.

2.4 90 209 To recover gravel roof systems, first remove all loose rock, dirt, and other debris. Prime the roof.

2.4 90 210 No existing roof system may contain moisture or wet insulation prior to recover.

2.4 90 212 Infrared analysis is required of all insulated recover applications prior to spraying.

2.4 90 300 Minimum Dry Film Thickness: Acrylic, 30 mils, minimum fire rating, UL 790, Class A. (Must meet manufacturer's UL rated assemblies.)

2.4 90 400 Minimum Dry Foam Thickness: Silicone, 22 mils, minimum fire rating, UL 790, Class A. (Must meet manufacturer's UL rated assemblies.)

2.5 MASONRY

2.5 10 100 Brick, remove and reset, 1 to 50 square feet

2.5 10 101 Brick must match existing in color and size. Must conform to ASTM C 216, grade MW, Type FBX. Common brick should meet ASTM C 62-75A-SW.

2.5 10 102 Type I Portland cement, ASTM C 150 or Type IA, ASTM C 150.

2.5 10 103 Masonry cement, ASTM C 91.

2.5 10 104 Hydrated lime, Type S, ASTM C 207.

2.5 10 105 Water, clean, potable and wet.

2.5 10 106 Admixture, shall be integral treatment to reduce water content and shrinkage.

2.5 10 107 Fine aggregate, clean natural sand conforming to ASTM C 144.

2.5 10 108 Mortar mix shall be 1/2/8 mix made from specified materials.

2.5 10 109 Contractor provides material, labor and equipment to perform work.

2.5 10 110 Using chisels, grinders, and hand tools, remove brick and/or joint.

2.5 10 111 Clean all mortar from repair area.

2.5 10 112 Mortar mix shall be 1/2/8 made from above materials using a minimum amount of water to make a workable mix.

2.5 10 113 All units shall be laid with properly mortared vertical and horizontal joints. Units will not be moved or shifted once put in place. All joints to be worked full with mortar.

2.5 10 114 Joints to match existing, approximately 3/8", neatly concave and tooled.

2.5 10 115 Work shall be cleaned free of loose mortar.

2.5 10 116 Masonry work shall be laid up in a running bond with reinforcement every 16" vertical or as specified on approved work order.

2.5 10 200 Brick, remove and reset, over 50 square feet

2.5 10 201 Brick must match existing in color and size. Must conform to ASTM C 216, grade MW, Type FBX. Common brick should meet ASTM C 62-75A-SW.

2.5 10 202 Type I Portland cement, ASTM C 150 or Type IA, ASTM C 150.

2.5 10 203 Masonry cement, ASTM C 91.

2.5 10 204 Hydrated lime, Type S, ASTM C 207.

2.5 10 205 Water, clean, potable.

2.5 10 206 Admixture, shall be integral treatment to reduce water content and shrinkage.

2.5 10 207 Fine aggregate, clean natural sand conforming to ASTM C 144.

2.5 10 208 Mortar mix shall be 1/2/8 mix made from specified materials.
2.5 10 209 Contractor provides material, labor and equipment to perform work.
2.5 10 210 Using chisels, grinders, and hand tools, remove brick and/or joint.
2.5 10 211 Clean all mortar from repair area.
2.5 10 212 Mortar mix shall be 1/2/8 made from above materials using a minimum amount of water to make a workable mix.
2.5 10 213 All units shall be laid with properly mortared vertical and horizontal joints. Units will not be moved or shifted once put in place. All joints to be worked full with mortar.
2.5 10 214 Joints to match existing, approximately 3/8", neatly concave and tooled.
2.5 10 215 Work shall be cleaned free of loose mortar.
2.5 10 216 Masonry work shall be laid up in a running bond with reinforcement every 16" vertical or as specified on approved work order.

2.5 10 300 Block, remove and reset
2.5 10 301 Brick must match existing in color and size. Must conform to ASTM C 216, grade MW, Type FBX. Common brick should meet ASTM C 62-75A-SW.
2.5 10 302 Type I Portland cement, ASTM C 150 or Type IA, ASTM C 150.
2.5 10 303 Masonry cement, ASTM C 91.
2.5 10 304 Hydrated lime, Type S, ASTM C 207.
2.5 10 305 Water should be clean and potable.
2.5 10 306 Admixture, shall be integral treatment to reduce water content and shrinkage.
2.5 10 307 Fine aggregate, clean natural sand conforming to ASTM C 144.
2.5 10 308 Mortar mix shall be 1/2/8 mix made from specified materials.
2.5 10 309 Contractor provides material, labor and equipment to perform work.
2.5 10 310 Using chisels, grinders, and hand tools, remove brick and/or joint.
2.5 10 311 Clean all mortar from repair area.
2.5 10 312 Mortar mix shall be 1/2/8 made from above materials using a minimum amount of water to make a workable mix.
2.5 10 313 All units shall be laid with properly mortared vertical and horizontal joints. Units will not be moved or shifted once put in place. All joints to be worked full with mortar.
2.5 10 314 Joints to match existing, approximately 3/8", neatly concave and tooled.
2.5 10 315 Work shall be cleaned free of loose mortar.
2.5 10 316 Masonry work shall be laid up in a running bond with reinforcement every 16" vertical or as specified on approved work order.

2.5 10 400 Coping stones, remove and reset
2.5 10 401 Coping stones must match existing in color and size.
2.5 10 402 Type I Portland cement, ASTM C 150.
2.5 10 403 Masonry cement, ASTM C 91.
2.5 10 404 Hydrated lime, Type S, ASTM C 207.
2.5 10 405 Water, clean, potable and wet.
2.5 10 406 Admixture, shall be integral treatment to reduce water content and shrinkage.
2.5 10 407 Fine aggregate, clean natural sand conforming to ASTM C 144.
2.5 10 408 Mortar mix shall be 1/2/8 mix made from specified materials.
2.5 10 409 Contractor provides material, labor and equipment to perform work.
2.5 10 410 Carefully remove coping stones. Remove all mortar and residue from parapet wall.
2.5 10 411 Mortar mix shall be 1/2/8 made from above materials using a minimum amount of water to make a workable mix.
2.5 10 412 Apply mortar mix to top of parapet and do not contaminate face of the building.
2.5 10 413 Set cleaned coping stones in place leaving 3/8" joint between stones.
2.5 10 415 Waterproof joints and stones as specified on approved work order.

2.5 20 100 Tuck Pointing, 8 foot high wall by linear foot
2.5 20 101 Grind out joints to a depth of 3/8” to 1/2” in depth, or under hard mortar is found.
2.5 20 102 Clean joint after grinding with compressed air, water or as required
2.5 20 103 Install new mortar, type S
2.5 20 104 Press mortar into joint and tool to match existing fascia
2.5 20 105 Price based on above ground or roof

2.6 METALWORK

2.6 10 100 Remove standard metal decking

2.6 10 101 Before work starts, area below work must be protected and/or barricaded before deck removal begins.
2.6 10 102 Remove deteriorated decking.
2.6 10 103 Dispose of old decking in an approved dumpsite or with scrap metal buyer.
2.6 10 104 All decking must be replaced and covered daily.

2.6 10 200 Install metal decking

2.6 10 201 Steel galvanized metal deck units, ASTM A 446, Grade A; galvanizing per ASTM A 525, G60 (SDI "Design Manual for Floor Decks and Roof Decks").
2.6 10 202 Use coated self-tapping deck screws.
2.6 10 203 All welding per SWA "Structural Welding Code."
2.6 10 204 Paint must be rust inhibitive. Existing deck will be painted, where required.
2.6 10 205 Install deck units and accessories in accordance with manufacturer's recommendations and final shop drawings.
2.6 10 206 Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks.
2.6 10 207 Place deck unit in straight alignment for entire length of run of cells and with close alignment between cells at ends of abutting units.
2.6 10 208 Place deck units flat and square, secured to adjacent framing without warp or excessive deflection.
2.6 10 209 Do not place deck units on concrete supporting structure until concrete has cured and is dry.
2.6 10 210 Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.
2.6 10 211 Fasten roof deck units to steel supporting members by not less than 1/2" diameter fusion welds, elongated welds of equal strength, spaced not more than 12" on center at supports, and at closer spacing where required for lateral force resistance.
2.6 10 212 Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds and methods used in correcting welding work.
2.6 10 213 Use welding washers where recommended by deck manufacturer.
2.6 10 214 Lock side laps of adjacent deck units between supports with screws on 36" centers.
2.6 10 215 Provide reinforcement at opening to match that which exists.

2.6 20 100 Remove metal counter flashing

2.6 20 101 Remove existing counter flashing.
2.6 20 102 Dispose of old counter flashing in an approved dumpsite or with scrap metal buyer.

2.6 20 200 Counter flashing, galvanized, 24 gauge, 6" width

2.6 20 201 Sheet steel, ASTM 526, with 1.25 oz. per square foot galvanized coating.
2.6 20 202 Hemmed and with a 45í drip edge.

2.6 20 300 Counter flashing, copper, 16 oz., 6" width

2.6 20 301 Copper, ASTM B 370-84O.
2.6 20 302 Hemmed and with a 45í drip edge.

2.6 20 400 Receiver flashing, galvanized 24 gauge

2.6 20 401 Sheet steel, ASTM 526, with G90 finish per ASTM 236
2.6 20 402 To be fabricated per SMACNA details.

2.6 30 100 Remove metal edge, gravel stop, eave strip, or coping

2.6 30 101 Remove existing counter flashing.
2.6 30 102 Dispose of waste in an approved dumpsite or with scrap metal buyer.

2.6 30 200 Metal edge, galvanized steel fascia/eave drip; 6" face, hemmed, continuous cleat, 3 " deck flange

2.6 30 201 Steel, ASTM A 526, with 1.25 oz. per square feet galvanized coating..

2.6 30 202 Metal fascia.
2.6 30 203 Treated wood cant.
2.6 30 204 Approved fasteners, according to Contractor.
2.6 30 205 Install fascia to roof edge. Installation to comply with fascia manufacturer's published specifications.
2.6 30 206 Flash (seal) fascia as specified by manufacturer.

2.6 30 300 Gravel stop, galvanized steel, 24 gauge, 6" face
2.6 30 301 Steel, ASTM A 526, with 1.25 oz. per square feet galvanized coating, 24 gauge.
2.6 30 302 Solder, ASTM B 32-93, alloy grade Sn50A. Neutralize flux after soldering.
2.6 30 303 Continuous cleat, 22 gauge sheet steel with 1.25 oz. per square feet galvanized coating.
2.6 30 304 Fabricate and install gravel stop per SMACNA and NRCA standards.
2.6 30 305 Set flashing in asphalt mastic 3" on center, staggered.
2.6 30 306 Strip flange per roofing manufacturer's specifications.
2.6 30 307 Continuous cleat.

2.6 40 100 Remove metal gutter
2.6 40 101 Remove existing gutter.
2.6 40 102 Dispose of old metal in an approved dumpsite or with scrap metal buyer.

2.6 40 200 Gutter, galvanized steel, ASTM 526, with 1.25 oz./square foot galvanized coating, 24 gauge, 5" box or ogee style
2.6 40 201 Install gutters where specified by work order.
2.6 40 202 Installation must conform to SMACNA manual details.
2.6 40 203 Stiffeners shall be installed 36" on center.

2.6 40 300 Gutter, 24 gauge, 5" box or ogee, painted, Kynar finish
2.6 40 301 Install gutters with approved fasteners where specified by work order.
2.6 40 302 Installation must conform to SMACNA manual details, and NRCA and roofing manufacturer's details.
2.6 40 303 Stiffeners shall be installed 36" on center.

2.6 40 400 Gutter, copper, 16 oz., half round, 5" wide
2.6 40 401 Install pre-manufactured copper gutters with approved fasteners where specified by work order.
2.6 40 402 Installation must conform to SMACNA manual details, and NRCA and roofing manufacturer's details.
2.6 40 403 Stiffeners shall be installed 36" on center.

2.6 40 500 Gutter, copper, 16 oz., half round, 6" wide
2.6 40 501 Install pre-manufactured copper gutters with approved fasteners where specified by work order.
2.6 40 502 Installation must conform to SMACNA manual details, and NRCA and roofing manufacturer's details.
2.6 40 503 Stiffeners shall be installed 36" on center.

2.6 50 100 Remove metal downspout
2.6 50 101 Remove existing downspout.
2.6 50 102 Dispose of old downspouts in an approved dumpsite or with scrap metal buyer.

2.6 50 200 Downspout, GI, 24 gauge 3" x 4", Kynar finished
2.6 50 201 Materials must have two coats of factory applied baked-on enamel, color selected by owner.

2.6 50 300 Downspout, GI, 24 gauge, 3" x 4"
2.6 50 301 Materials per ASTM A 526, with 1.25 oz. per square feet galvanized coating.

2.6 50 400 Downspout, GI, 24 gauge, 4" round, Kynar finished
2.6 50 401 Materials per ASTM A 526, with 1.25 oz. per square feet galvanized coating.

2.6 50 500 Downspout, copper, 16 oz., 6" round
2.6 50 501 ASTM B 370-84A, to match existing spouts.

2.6 50 600 Downspout, strainer
2.6 50 601 Copper.
2.6 50 602 Galvanized steel.
2.6 50 603 Install downspout strainer in gutter, where specified.

2.6 60 100 Metal flashing, apron flashing, 9" wide
2.6 60 101 16 oz. copper per ASTM B 370-81.
2.6 60 102 Steel, ASTM A 526, with 1.25 oz. per square feet galvanized coating.
2.6 60 103 Installation must conform to SMACNA manual details, and NRCA and roofing manufacturer's details.

2.6 60 200 Metal flashing, step flashing
2.6 60 201 16 oz. copper per ASTM B 370-81.
2.6 60 202 Steel, ASTM A 526, with 1.25 oz. per square feet galvanized coating.
2.6 60 203 Flashing must conform to SMACNA manual details.

2.6 60 225 Flashing, pipe penetration, single ply PVC
2.6 60 226 Materials per SMACNA or NRCA specifications.
2.6 60 228 Flashing must conform to SMACNA manual details.

2.6 60 300 Metal splash pan, 16 oz.
2.6 60 301 16 oz. copper per ASTM B 370-81.
2.6 60 302 Steel, ASTM A 526, with 1.25 oz. per square feet galvanized coating.
2.6 60 303 Solder and flux.
2.6 60 304 Fabricate splash pans a minimum of 12" wide, 18" long, with 1" sides hemmed 1/2" on 3 sides.
2.6 60 305 Installation must conform to SMACNA manual details.

2.6 60 350 Metal splash pan, 24 gauge galvanized
2.6 60 351 24 gauge hot dipped galvanized steel, grade C, G-90 coating ASTM A653-94.
2.6 60 352 Fabricate splash pan a minimum of 12” wide, 18” long with 1” sides, hemmed ½” on three sides.
2.6 60 353 Installation must conform SMACNA manual details.

2.6 60 400 Metal trim, aluminum, .032" thick, painted
2.6 60 401 Material shall have a Kynar finish.
2.6 60 402 Fabricate and install metal trim to conform to building as specified in work order.
2.6 60 403 Installation must conform to SMACNA manual details.

2.6 60 500 Metal storm collar
2.6 60 501 16 oz. copper per ASTM B 370-81.
2.6 60 502 Steel, ASTM A 526, with 1.25 oz. per square feet galvanized coating.
2.6 60 503 Stainless steel, 26 gauge, ASTM A 167-82.
2.6 60 504 Aluminum, .032, ASTM B 221-82A.
2.6 60 505 Install storm collars over all pitched pockets as directed by Contractor using specified material.
2.6 60 506 Install in cone shaped configuration per NRCA.

2.6 60 600 Metal coping, galvanized steel, 24 gauge, standing seam
2.6 60 601 Steel, ASTM A 526, with 1.25 oz. per square feet galvanized coating.
2.6 60 602 Continuous cleat, 22 gauge, galvanized sheet steel, ASTM A 526.
2.6 60 603 Fasteners as specified by roofing manufacturer.
2.6 60 604 Fabricate coping cap with standing seams per SMACNA details.
2.6 60 605 Fascia edges to extend past wood a minimum of 1".
2.6 60 606 Fasten face with continuous lock strip.
2.6 60 607 Fasten backside with screws and neoprene washers 30" on center.

2.6 60 700 Standing seam panels, 24 gauge prefinished
2.6 60 701 Prefinished steel shall be 24 gauge hot dipped galvanized steel, grade C, G-90 coating ASTM A653-94. Finish shall be Kynar 500 or Hylar 5000 flourocarbon coating, factory applied, or approved equal Color shall be standard factory color.
2.6 60 702 Standing seam panel shall be a flat panel with a minimum 1” turn up per side.
2.6 60 703 Panels shall be installed per manufacturer’s instructions.

2.6 60 750 R panels, 26 gauge pre-finished

2.6 60 751 Panels are to be 26 gauge polyester with 20 year finish.

2.6 60 752 Install with through panel fasteners with neoprene washers

2.6 60 753 Panels are to be fabricated with bearing surface on lap edge.

2.6 60 800 Panel batten covers, standing seam

2.6 60 801 Batten covers shall be the same color as standing seam panels, shall have an internal gasket, and shall be supplied by the standing seam manufacturer.

2.6 60 802 Install per manufacturer's instructions.

2.6 60 900 Hat channels galvanized

2.6 60 901 Hat channels shall be constructed from minimum 26 gauge galvanized iron with min ¾" high leg and ½" fastening edge.

2.6 60 902 Install as required for mounting of panels.

2.6 60 950 Standing seam continuous clip

2.6 60 951 Continuous clip shall be supplied by standing seam manufacturer and installed per manufacturer's instructions.

2.6 60 975 Standing seam 4" clip

2.6 60 976 4" clip shall be supplied by standing seam manufacturer and installed per manufacturer's instructions.

2.6 60 980 Standing seam panels, 18" wide

2.6 60 981 The standing seam metal roof system shall consist of roofing panels either 12", 16", or 18" wide and seams being 2-3/8" minimum height for added upward pressures and aesthetic appeal. The panel shall be symetrical as to allow the removal of one panel to repair a damaged panel or to install new equipment without removing multiple panels. Panel seams shall have a separate cap component configuration which provides for a total of 4 layers of steel surrounding the anchor clip for prevention of water infiltration and increased system strength. The seam cap shall be designed to receive 2 beads of continuous hot applied gasketing sealant which will be applied independent of the anchor clip to allow for unlimited thermal movement of the panel without damage to the cap sealant. The profile of the panel shall have mesa's every 2 inches on center continuous throughout panel which are a minimum of 1.5 inches wide. Metal roof system shall have one piece concealed anchor clips (two piece clips are not acceptable) manufactured from 16 gauge steel. Clip must maintain a clearance of a minimum of three-eights (3/8) inches between panel and substrate for proper ventilation to help prevent condensation on underside of panel and eliminate the contact of panel fastener head to panel. Roofing panels for curved roofs must be mechanically curved to the exact radius of each curved roof area. Panels may be mechanically curved in the factory or on site. Mechanical curving equipment shall be operated by a full time experienced technician. Flat panels conformed to the roof shape are not acceptable and will be rejected. Roofing system manufacturer must supply all components of the roof system including any roll good materials if required. Any secondary products that are required which cannot be supplied by the specified manufacturer must be recommended and approved in writing by primary manufacturer prior to bidding. Interface between panel and clip shall provide for unlimited thermal movement in each direction along the longitudinal direction. Roof system shall be designed to withstand negative (uplift) design wind loading pressures complying with the Design Code: (American Socitey of Civil Engineers), ASCE 7-98, Method 2 for Components and Cladding. Roof systems capacity to meet negative (uplift) pressures shall be determined using pleated airbag method in accordance with ASTM E 1592, testing of sheet metal roof panels. Allowable safe working loads shall be determined by dividing the ultimate test load by the safety factor specified above. Owner shall receive one (1) warranty from manufacturer of roof panels covering all of the following criteria. Multiple warranties are not acceptable. The roofing system manufacturer's warranty shall be a 30 year watertight warranty, including coverage for all trim, flashings, and penetrations associated with the standing seam roof area. The manufactuer's warranty shall also include 20 years of coverage on the panel finish including checking, crazing, peeling, chalking, fading and/or adhesion. Also the roofing system manufacturer must be able to provide a single warranty for standing seam roof areas, membrane roof areas (if applicable), and transitions

between the two material types. Roof system manufacturer shall have in place a documented, standardized method for maintaining quality control such as ISO-9001 approval.
Roof system shall be comprised of steel sheet, Aluminum-Zinc Alloy Coated, ASTM A792,
Roof system paint coating shall consist of Fluorocarbon (Kynar 500), epoxy primer baked both sides, as approved by finish coat manufacturer. Install all components of the roof system in exact accordance with the manufacturer's standard published procedures as applicable to these project conditions and substrates.

2.6 60 990 Sealed Seam Metal Roofing

2.6 60 991 Provide a factory-formed, prefinished, sealed-seam metal roofing system with non-thermal bridging fastening system over rigid insulating substrate. Steel roof panels shall be pre-manufactured in continuous lengths up to one hundred feet. Flashings, edges, and terminations shall be pre-manufactured by the panel manufacturer. Steel framing and support structure shall be pre-fabricated and furnished by the panel manufacturer. Roof system must have the ability to withstand a minimum 200 PSF live load. Roof system shall be verified to support an 80 PSF design live load with a 2.5 minimum factor of safety. The sealed seam of the roofing system shall be tested and verified to retain 3" of water above the highest point of the seam for a period of one hour without any leakage. Manufacturer must provide an independent laboratory testing report for system design load and seam integrity. Manufacturer shall provide a professional engineer's documentation that roofing system incorporates sufficient allowance for stress and movement. Roof system installer shall demonstrate written proof that they have completed the manufacturer's Approved Roofing Contractor course and is formally licensed for the installation of this roof system. Roof system Manufacturer shall have in place a documented, standardized method for maintaining quality control such as ISO-9001 approval. Complete roof system shall be warranted against leaks for a period of 30 years. Roof system, as specified, shall have been in continuous use for a minimum of ten (10) years. Roof system shall be comprised of steel sheet, Aluminum-Zinc Alloy Coated, ASTM A792, Coating Designation AZ-50, in thickness of .0157 for field panel, .0217 for accessory components, .0336 for framing pieces by min. 36 in. by coil, chemically treated, commercial, lock-forming quality. Roof system paint coating shall consist of siliconized modified polyester or Fluorocarbon (Kynar 500), epoxy primer baked both sides, as approved by finish coat manufacturer. Roof system factory seams shall be comprised of sealant consisting of a hot melt (100% solids thermoplastic material) in a 100% consistent application to affect a permanent, water-tight seal in a full compression configuration. Field applied seams shall be comprised of seam screws size #10 by 3/4" supplied by roof system manufacturer.In order to maximize quality control and conform to inorganic coating manufacturers' warranty limitations, all roll forming processes shall be done at the manufacturer's factory. Absolutely no roll forming will be permitted on the job site. Install all components of the roof system in exact accordance with the manufacturer's standard published procedures as applicable to these project conditions and substrates.

2.6 70 100 Resolder joints in sheet metal

2.6 70 101 Flux, cleaner, and solder are needed.
2.6 70 102 Wire brush the joint.
2.6 70 103 Clean area to be soldered.
2.6 70 104 Apply flux and solder as per SMACNA specifications.
2.6 70 105 Clean up mess when through.

2.6 70 200 4” Metal stud 16 gauge galvanized

2.6 70 201 Metal stud shall be hot dipped galvanized steel, grade C, G90 coating, ASTM A 653-94.

2.6 70 300 6” Metal stud 16 gauge galvanized

2.6 70 201 Metal stud shall be hot dipped galvanized steel, grade C, G90 coating, ASTM A 653-94.

2.6 70 400 Roof jack, galvanized

2.6 70 401 24 gauge galvanized G90 finish per current ASTM 236.

2.6 70 402 Roof jack to be manufactured per SMACNA details.
2.6 70 403 Roof jack flange to be set in plastic cement and stripped in with two plies of felt.

2.6 70 500 Ice Dams , standing seam
2.6 70 501 To install ice dam, clean panels with isopropyl alcohol.
2.6 70 502 Apply thin coat of primer to roof surface.
2.6 70 503 Peel release paper backing off adhesive tape on base.
2.6 70 504 Place ice dam on metal panel, apply even pressure.
2.6 70 505 Apply bead of sealant around perimeter.

2.6 70 600 Snow Retention Systems , standing seam
2.6 70 601 Install Clamps appropriately On The Panel Seams of the Snow Retention Systems.
2.6 70 602 Install aluminum bar to clamps, attach the clip .
2.6 70 603 Install desired color to rail.

2.6 70 700 Zees 11 gauge
2.6 70 701 4” Zee purlin – 11 gauge, primed painted purlin.
2.6 70 702 Purlin should be fabricated by roll-forming or shop bending.

2.7 WOODWORK

2.7 10 100 Demolition of plywood or standard 1" x 6" decking
2.7 10 101 Before work starts, area below work must be protected and/or barricaded before deck removal begins.
2.7 10 102 Remove deteriorated decking, nails and fasteners.
2.7 10 103 Dispose of old decking that can't be reused in an approved dumpsite.
2.7 10 104 Inspect roof joists; repair or replace as directed by Contractor.
2.7 10 105 All decking must be replaced and covered daily and comply with OSHA, EPA, and local building codes and regulations.

2.7 10 200 Demolition of standard 2" x 6" tongue and groove decking
2.7 10 201 Before work starts, area below work must be protected and/or barricaded before deck removal begins.
2.7 10 202 Remove deteriorated decking, nails and fasteners.
2.7 10 203 Dispose of old decking that can't be reused in an approved dumpsite.
2.7 10 204 Inspect roof joists; repair or replace as directed by Contractor.
2.7 10 205 All decking must be replaced and covered daily and comply with OSHA, EPA, and local building codes and regulations.

2.7 20 100 Plywood decking, CDX, 1/2" thick
2.7 20 101 Plywood panels shall be identified with the American Plywood Association (APA) grade trademark and shall meet the requirements of U.S. Products Standard PS-1 for soft plywood construction.
2.7 20 102 All plywood which has any edge or surface permanently exposed to weather shall be of the exterior type.
2.7 20 103 Plywood roof decking shall be grade C-D or better with exterior glue.
2.7 20 104 Proper fasteners shall be used.
2.7 20 105 Verify that surfaces to receive decking are prepared and ready.

2.7 20 200 Plywood decking, CDX, 5/8" thick
2.7 20 201 Plywood panels shall be identified with the American Plywood Association (APA) grade trademark and shall meet the requirements of U.S. Products Standard PS-1 for soft plywood construction.
2.7 20 202 All plywood which has any edge or surface permanently exposed to weather shall be of the exterior type.
2.7 20 203 Plywood roof decking shall be grade C-D or better with exterior glue.
2.7 20 204 Proper fasteners shall be used.

2.7 20 205 Verify that surfaces to receive decking are prepared and ready.

2.7 20 300 Plywood decking, CDX, 3/4" thick

2.7 20 301 Plywood panels shall be identified with the American Plywood Association (APA) grade trademark and shall meet the requirements of U.S. Products Standard PS-1 for soft plywood construction.

2.7 20 302 All plywood which has any edge or surface permanently exposed to weather shall be of the exterior type.

2.7 20 303 Plywood roof decking shall be grade C-D or better with exterior glue.

2.7 20 304 Proper fasteners shall be used.

2.7 20 305 Verify that surfaces to receive decking are prepared and ready.

2.7 20 400 Standard 1" x 6" decking

2.7 20 401 Plywood panels shall be identified with the American Plywood Association (APA) grade trademark and shall meet the requirements of U.S. Products Standard PS-1 for soft plywood construction.

2.7 20 402 All plywood which has any edge or surface permanently exposed to weather shall be of the exterior type.

2.7 20 403 Plywood roof decking shall be grade C-D or better with exterior glue.

2.7 20 404 Proper fasteners shall be used.

2.7 20 405 Verify that surfaces to receive decking are prepared and ready.

2.7 20 500 Standard 2" x 6" tongue and groove decking

2.7 20 501 2 x 6 commercial grade with 15% maximum moisture content, single tongue and groove edges with FB-1200 psi. Must be stamped with dry stamp.

2.7 20 502 Nails must meet Federal Specification FF-N-105B for common nails, style 10, cement coated.

2.7 20 503 Verify that the surfaces are still ready to receive decking.

2.7 20 504 Install decking continuous over three supports.

2.7 20 505 Drive deck members tight using short block.

2.7 20 506 Nail each member to support with two 30d common blind and face nail for decking up to 2 1/4" thick and 40d common blind and face nail for decking 2 3/4" to 3" thick.

2.7 20 507 Nail groove to tongue at 40 to 50 degree angle starting l 1/4" from groove edge. Nail to each perlin using 8d common nails.

2.7 30 100 Cants, wood fiber, trapezoidal, 1 1/2" x 5 5/8"

2.7 30 101 Wood fiberboard, ASTM C 208, asphalt impregnated.

2.7 30 102 Type III steep asphalt, ASTM D 312-84, UL Class A.

2.7 30 103 Install wood fiber cants set in a continuous mopping of steep asphalt at a rate of 25 lbs. per 100 square feet.

2.7 30 200 Cants, treated wood, 4" x 4" diagonal

2.7 30 201 4 x 4 treated wood cut on bias to form cant strip. Southern Pine, No. 2 grade, free from warping and decay. Pressure treated with Chromated Copper Arsenate (CCA) to meet AWPB, LP22, 0.40 retention and marked.

2.7 30 202 Nails must meet Federal Specification FF-N-105B for common nails, style 10, cement coated.

2.7 30 203 Install treated cant to wood nailer as outlined in work order.

2.7 30 204 Cants to be nailed 16" on center and fastened to walls as required by roofing manufacturer.

2.7 30 205 Top edge shall be flush with wall.

2.7 30 206 Corners are to be mitered to fit snug.

2.7 40 100 Nailer, treated wood, 1" x 4"

2.7 40 101 1 x 4 treated wood. Southern Pine, No. 2 grade, free from warping and decay. Pressure treated with Chromated Copper Arsenate (CCA) to meet AWPB, LP22, 0.40 retention and marked.

2.7 40 102 Nails must meet Federal Specification FF-N-105B for common nails, style 10, cement coated.

2.7 40 103 Install wood blocking as outlined in work order.

2.7 40 104 Fasten blocking with approved fasteners in two rows staggered on 24" centers.

2.7 40 200 Nailer, treated wood, 2" x 4"

2.7 40 201 2 x 4 treated wood. Southern Pine, No. 2 grade, free from warping and decay. Pressure treated with Chromated Copper Arsenate (CCA) to meet AWPB, LP22, 0.40 retention and marked.

2.7 40 202 Nails must meet Federal Specification FF-N-105B for common nails, style 10, cement coated.
2.7 40 203 Install wood blocking as outlined in work order.
2.7 40 204 Fasten blocking with approved fasteners in two rows staggered on 24" centers.

2.7 40 300 Nailer, treated wood, 2" x 6"
2.7 40 301 2 x 6 treated wood. Southern Pine, No. 2 grade, free from warping and decay. Pressure treated with Chromated Copper Arsenate (CCA) to meet AWPB, LP22, 0.40 retention and marked.
2.7 40 302 Nails must meet Federal Specification FF-N-105B for common nails, style 10, cement coated.
2.7 40 303 Install wood blocking as outlined in work order.
2.7 40 304 Fasten blocking with approved fasteners in two rows staggered on 24" centers.

2.7 50 100 Curbing, treated wood, 2" x 12"
2.7 50 101 2 x 12 treated wood. Southern Pine, No. 2 grade, free from warping and decay. Pressure treated with Chromated Copper Arsenate (CCA) to meet AWPB, LP22, 0.40 retention and marked.
2.7 50 102 Nails must meet Federal Specification FF-N-105B for common nails, style 10, cement coated.
2.7 50 103 Prepare area to receive curb as outlined in work order.
2.7 50 104 Fabricate curb to fit opening as outlined in work order.
2.7 60 105 Nail or screw curb in place using applicable fastener for deck type.

2.7 60 100 Joist, fir, 2" x 6"
2.7 60 101 2 x 6 fir, standard grade or better for light framing; grade 2 or better for structural framing.
2.7 60 102 Nails must meet Federal Specification FF-N-105B for common nails, 16d, style 10, coated.
2.7 60 103 Bolts, ASTM A 309-76B, Grade A.
2.7 60 104 Lag screws and bolts FF-561-C, Type II, Hex Head, Grade B.
2.7 60 105 Toggle Bolts, Federal Specification FF-B-558-C, Type I, Class A, Style I.
2.7 60 106 Install new joist with crown edge up.
2.7 60 107 Support ends of each member minimum 3" of bearing on wood.
2.7 60 108 Lap members framing from opposite side of beams, minimum 4".
2.7 60 109 Support joist alternately at ends with solid blocking, 2" thick by depth of joist, between members crossing bearing joint.
2.7 60 110 When nominal depth to thickness ratio of joist exceeds 6, install bridging at 8' intervals.
2.7 60 111 Double rafters at roof openings to provide headers and trimmers and support with metal hangers following local building code.

2.7 60 200 Joist, fir, 2" x 10"
2.7 60 201 2 x 10 fir, standard grade or better for light framing; grade 2 or better for structural framing.
2.7 60 202 Nails must meet Federal Specification FF-N-105B for common nails, 16d, style 10, coated.
2.7 60 203 Bolts, ASTM A 309-76B, Grade A.
2.7 60 204 Lag screws and bolts FF-561-C, Type II, Hex Head, Grade B.
2.7 60 205 Toggle Bolts, Federal Specification FF-B-558-C, Type I, Class A, Style I.
2.7 60 206 Install new joist with crown edge up.
2.7 60 207 Support ends of each member minimum 3" of bearing on wood.
2.7 60 208 Lap members framing from opposite side of beams, minimum 4".
2.7 60 209 Support joist alternately at ends with solid blocking, 2" thick by depth of joist, between members crossing bearing joint.
2.7 60 210 When nominal depth to thickness ratio of joist exceeds 6, install bridging at 8' intervals.
2.7 60 211 Double rafters at roof openings to provide headers and trimmers and support with metal hangers following local building code.

2.7 60 300 Fascia board, 1” x 10” treated wood
2.7 60 301 1” x 10” treated wood Southern pine, number 2 grade, free from warping and decay, pressure treated with Chromated Copper Arsenate (CCA) to meet AWPB, LP22, 0.40 retention and marked.
2.7 60 302 Nails must meet Federal Specification FF-N-105B for common nails.
2.7 60 303 Install 1” x 10” as outlined in work order.

2.8 ROOF SPECIALTIES AND ACCESSORIES

2.8 10 100 Remove roof hatch
2.8 10 101 Remove according to work order, and dispose of in compliance with all laws.

2.8 10 200 Roof hatch, 16 gauge or heavier, 2'6" x 3'0"
2.8 10 201 Aluminum hatch, insulation curb and top, Bilco Type S, Babcock Davis or approved equal.
2.8 10 202 Install hatch as directed on work order.
2.8 10 203 Flash per line on work order.

2.8 10 300 Roof hatch, 16 gauge or heavier, larger sizes
2.8 10 301 Aluminum hatch, insulation curb and top, Bilco Type S, Babcock Davis or approved equal.
2.8 10 302 Install hatch as directed on work order.
2.8 10 303 Flash per line on work order.

2.8 10 400 Tectum, roof deck tile, per inch of depth, installed with grout
2.8 10 401 Tile shall have a weight of 3 ½ pounds per square foot.
2.8 10 402 Tile shall have a dead load of 50 pounds, using a 32” wide nominal width.
2.8 10 403 Tectum tile shall meet design number NM504 and BUL and FM approved.

2.8 20 100 Remove existing roof drain, except plumbing
2.8 20 101 Procure new roof drain manufactured by Josam or Smith, to match existing.
2.8 20 102 Prepare roof mat in drain area per work order.
2.8 20 103 Remove existing roof drain.
2.8 20 104 Install new drain and flash.
2.8 20 105 Install deck clamp per work order.

2.8 20 200 Install new roof drain, except plumbing
2.8 20 201 Install new drain and flash per work order.

2.8 20 225 Install single ply PVC interior roof drain
2.8 20 226 Install new drain and flash per manufacturer specifications.

2.8 20 250 Install new roof drain cover
2.8 20 201 Install roof drain and secure per work order.

2.8 20 300 Re-flash existing roof drain
2.8 20 301 Asphalt primer per ASTM D3960, quick drying.
2.8 20 302 4 lb. sheet lead, ASTM B29.
2.8 20 303 Reinforcement mesh, vinyl coated woven glass scrim, weight 1.32 lb/100 square feet per ASTM D146, tensile strength 75 lb ft per ASTM D 146.
2.8 20 304 Asphalt mastic, heavy fibered mastic with penetrating oils and plasticizing agents to meet UL and ASTM D276, ASTM D1475, 105í flash point per ASTM D93.

2.8 20 400 Plumbing stack, 4# lead flashing
2.8 20 401 Asphalt primer per ASTM D3960, quick drying.
2.8 20 402 4 lb. sheet lead, ASTM B 29.
2.8 20 403 Asphalt mastic, heavy fibered mastic with penetrating oils and plasticizing agents to meet UL and ASTM D276, ASTMD 1475, 105í flash point per ASTM D93.
2.8 20 404 Install new 4 lb. lead plumbing stack flashing as in work order.
2.8 20 405 Prime flashing flange and flash the flange as specified by membrane manufacturer.

2.8 20 500 Scupper, sheet steel, 24 gauge, ASTM A 526, match existing configuration
2.8 20 501 Steel, ASTM A 526, with 1.25 oz. per square feet galvanized coating, 24 gauge.
2.6 30 502 Solder, ASTM B 32, alloy grade Sn50A.
2.8 20 503 Neutralize flux after soldering.
2.8 20 504 Remove old scupper and install new scupper to match existing.
2.8 20 505 Flash per manufacturer's instructions.

2.8 20 525 Scupper, metal coated, single ply PVC
2.8 20 526 Install as per manufacturers specifications
2.8 20 527 Remove old scupper and install new scupper to match existing.
2.8 20 528 Flash per manufacturer's instructions.

2.8 20 600 Conductor head
2.8 20 601 24 gauge galvanized steel ASTM A526 with 1.25 oz. per square foot galvanized coating.
2.8 20 602 Conductor head to match style and configuration of existing conductor heads.

2.8 30 100 Remove existing walkway, built-up roofs
2.8 30 101 Furnish locks, equipment and labor to remove walkways.
2.8 30 102 Do not damage roof.
2.8 30 103 Dispose of materials as in other specifications.

2.8 30 200 Walkway, built-up roofs
2.8 30 201 3 x 5 roof tread, asbestos free. Asphaltic board reinforced with fiberglass and granulated surface to meet or exceed ASTM C203, ASTM D4977, and ASTM D3746.
2.8 30 202 Adhesive as specified by manufacturer.
2.8 30 203 Install roof treads according to work order.
2.8 30 204 Adhere treads with tread manufacturer's adhesive.

2.8 40 100 Roof Ventilators, per 2000 CFM
2.8 40 101 Curb mounted rooftop exhaust fan; centrifugal up blast; 115/230V, 1 phase motor, ½ HP; 1645 RPM; backward incline impeller,
2.8 40 102 Minimum volume of 2000 CFM at 0.5” E.S.P
2.8 40 103 Install roof ventilators per roof membrane manufacturer's specification.

2.8 40 200 Install roof curb with flashing nailer, 3’ by 6’
2.8 40 201 Furnish and install roof curb per roof membrane manufacturer's specification.
2.8 40 202 Curb to be 16” high with bottom supporting flange and top nailer to fasten flashing to.
2.8 40 203 Cut metal deck to install 3” by 3” by 3/16” angle iron under deck
2.8 40 204 Attach curb to deck with #12 screws 12” on center

2.8 40 300 Install roof curb, owner furnished
2.8 40 201 Install roof curb per roof membrane manufacturer's specification.

2.8 40 400 Furnish and install skylight, 4’ by 4’
2.8 40 401 Install skylight as per manufacturer's specification.
2.8 40 402 Shall have a thermal integral curb with 9” nominal height
2.8 40 403 Outer dome shall be clear acrylic, 3/16” minimum thickness
2.8 40 404 minimum 22 gauge outer wall, inner liner bonded to 1 ½” thick rigid foam insulation

2.8 40 500 Install temporary fall protection, eight linear feet
2.8 40 501 Install fall protection per manufacturer's specification.
2.8 40 502 Install fall protection per OSHA requirements.

2.8 50 100 Roof ladder, steel, bolted to concrete, up to 20 feet, without cage
2.8 50 101 Fixed ladder with walk-thru handrails. Ladders are designed for applications where safe landing access is required. Ladders are one-piece welded assemblies for use in applications less than 20 feet in vertical height.
2.8 50 102 Side members are 1/4" x 2" x 2" steel angle with 3/4" corrugated steel round climbing rungs on 12" centers. Standoff mounting brackets are 7".
2.8 50 103 Walk-thru handrails extend 42" above landing surface. Mounting brackets included. Gray lacquer finish is standard. Safety cages are designed to OSHA specifications with flared bottom opening for easy entry.
2.8 50 104 Install roof access ladder where specified in contract.
2.8 50 105 All fastening, design, and height requirements to comply with local, state and Federal codes for access ladders.

2.8 50 150 Pipe supports, ½” to 1 ½”
2.8 50 151 Pipe supports shall be a factory fabricated support using polycarbon or metal base and roller.
2.8 50 152 Supports shall be installed per manufacturer’s instructions.
2.8 50 153 Supports shall be spaced no more than 10 feet apart.

2.8 50 175 Pipe supports, 2” to 3 ½”
2.8 50 176 Pipe supports shall be a factory fabricated support using polycarbon or metal base and roller.
2.8 50 177 Supports shall be installed per manufacturer’s instructions.
2.8 50 178 Supports shall be spaced no more than 10 feet apart.

2.8 50 200 Roof ladder, steel, bolted to concrete, 20 feet and up, with cage
2.8 50 201 Fixed ladder with walk-thru handrails. Ladders are designed for applications where safe landing access is required. Ladders are one-piece welded assemblies for use in applications more than 20 feet in vertical height.
2.8 50 202 Side members are 1/4" x 2" x 2" steel angle with 3/4" corrugated steel round climbing rungs on 12" centers. Standoff mounting brackets are 7".
2.8 50 203 Walk-thru handrails extend 42" above landing surface. Mounting brackets included. Gray lacquer finish is standard. Safety cages are designed to OSHA specifications with flared bottom opening for easy entry.
2.8 50 204 Install roof access ladder where specified in contract.
2.8 50 205 All fastening, design, and height requirements to comply with local, state and Federal codes for access ladders.

2.8 50 300 Roof ladder, security ladder guard
2.8 50 301 Security ladder guard is 6' long and is mounted directly over the ladder climbing rungs to prevent unauthorized use. Ladder guard has a one-piece continuous hinge and a lockable hasp.
2.8 50 302 Mount ladder guard per manufacturer's instructions.

2.8 60 100 Termination bar, aluminum, 1/4" x 1"
2.8 60 101 1/4" x 1" extruded aluminum termination bar with caulking cup to meet ASTM B 2221-85A.
2.8 60 102 Fasteners to meet Federal Specifications FF-N-105B (3), Type II, Style 20, roofing nails; 6061-t913, flat head, diamond point, round, barbed shank to wood curbing.
2.8 60 103 Lead anchors 1/4" x 1" diameter by specified length to masonry/concrete to meet ASTM B 29-79 (84).
2.8 60 104 Install termination bar to specified area per work order.
2.8 60 105 Fasten termination bar 8" on center.

2.8 70 100 Pitch pocket, 24 gauge, GI, 4" x 4", with storm collar
2.8 70 101 Materials per SMACNA or NRCA specifications.
2.8 70 102 Install pitch pocket and flash per membrane manufacturer.
2.8 70 103 Fasten storm collar and caulk with approved sealant.

2.8 70 150 Pre built form with filler, 6”
2.8 70 151 Materials per SMACNA or NRCA specifications.
2.8 70 152 Install form and flash per membrane manufacturer.
2.8 70 153 Caulk with approved sealant.

2.8 70 200 Pitch pocket, 24 gauge, GI, 8" x 8", with storm collar
2.8 70 201 Materials per SMACNA or NRCA specifications.
2.8 70 202 Install pitch pocket and flash per membrane manufacturer.
2.8 70 203 Fasten storm collar and caulk with approved sealant.

2.8 70 250 Pre built form with filler, 8”
2.8 70 251 Materials per SMACNA or NRCA specifications.
2.8 70 252 Install form and flash per membrane manufacturer.
2.8 70 253 Caulk with approved sealant.

2.8 70 300 Pitch pocket, resurface top only
2.8 70 301 Material needed, asphalt mastic.
2.8 70 302 Remove loose materials.

2.8 70 303 Fill pitch pocket with mastic, crown 1/2 to shed water, size 4" x 4".

2.8 70 325 Pitch pocket, single ply PVC
2.8 70 326 Materials per SMACNA or NRCA specifications.
2.8 70 326 Remove loose materials.
2.8 70 326 Fill pitch pocket with mastic, crown 1/2 to shed water.

2.8 80 100 Expansion joint, butyl or neoprene bellows, galvanized flange
2.8 80 101 Install materials with fasteners as per work order.

2.8 80 200 Expansion joint, 24 gauge galvanized G 90 metal
2.8 80 201 Joint to be fabricated and installed as per SMACNA details.
2.8 80 202 Joint to be roof to roof, not to exceed 3" opening.
2.8 80 203 Joint shall include 40 mil vapor barrier draped into opening between nailer.

2.8 90 100 Reflective coating applied, metal roof, Energy Star rated equiv. to Alumination 301
2.8 90 101 Remove all debris , dust and dirt with by using a 2000 psi power washer.
2.8 90 102 Apply primer as needed.
2.8 90 103 Apply reflective coating by brush, roller or spray gun to specified coverage rates by manufacturer.

2.8 90 200 Reflective coating applied, single ply/bur, Energy Star rated equiv. to Solargard Ultra
2.8 90 201 Remove all debris , dust, grease, oil and dirt with by using a 2000 psi power washer.
2.8 90 202 Apply primer to specified coverage rates by manufacturer
2.8 90 203 Apply reflective coating by spray gun to specified coverage rates by manufacturer.

2.9 ROOF SERVICES

2.9 10 100 Asbestos core testing
2.9 10 101 Asbestos core test size, 2" x 2".
2.9 10 102 Send to accredited lab to produce report on asbestos content.
2.9 10 103 Repair hole left by core sample.

2.9 10 200 Core analysis, 14" x 14"
2.9 10 201 Analysis and evaluation of 14" x 14" roof core. Specific information such as tensile strength, membrane type, bitumen type and bitumen softening point shall be provided to determine whether a roof should be restored or replaced.
2.9 10 202 Core replaced.

2.9 20 100 Non destructive roof scan, up to 50,000 square feet, full service
2.9 20 101 A.G.A. infrared scanning equipment for rooftop analysis.
2.9 20 102 Full service shall include daytime inspection of roof area to be scanned with day time photos of roof conditions.
2.9 20 103 Nighttime infrared scan with painted lines of wet areas and verification of survey results using cores and moisture probes to verify infrared results.
2.9 20 104 A comprehensive report that includes outline drawing of building showing wet insulation, results of core analysis, roof condition report, energy loss estimate.

2.9 20 200 Non destructive roof scan, up to 50,000 square feet, limited service
2.9 20 201 A.G.A. infrared scanning equipment for rooftop analysis.
2.9 20 202 Limited service shall include daytime inspection of roof area to be scanned with day time photos of roof conditions.
2.9 20 203 Night time infrared scan with painted lines of wet areas and verification of survey results using cores and moisture probes to verify infrared results.
2.9 20 204 Does not include the comprehensive report.

2.9 30 100 On-site Construction services, basic service
2.9 30 101 Takes core sample before start of project, Inspects roofing products when delivered on

site, confirms application process at 25% and 75% percent completion, kettle temperatures, makes pre-construction and final completion meetings.

2.9 30 102 Furnishing three written reports to owner and CAP.

2.9 30 200 On-site Construction services, full service

2.9 30 201 Regularly scheduled monitoring of roofing products used, application process, kettle temperatures, caulking, decking, insulation, and waterproofing at time of application to ensure successful completion of the project.

2.9 30 202 Provide written reports verifying work and time spent on site will be given to the utilizing agency and CAP.

2.9 40 100 Field/shop drawings, up to 10,000 square feet

2.9 40 101 Roof drawing (scaled 1/8").

2.9 40 102 Sectional details.

2.9 40 103 Perimeter details (scaled 1 1/2" or 3/4").

2.9 40 200 Field/shop drawings, over 10,000 square feet

2.9 40 201 Roof drawing (scaled 1/8").

2.9 40 202 Sectional details.

2.9 40 203 Perimeter details (scaled 1 1/2" or 3/4").

2.9 40 300 Structural Engineer Plans and Specifications with Professional Seal

2.9 40 301 Plans and Specifications to be Sealed by a Structural Engineer, licensed by the State of Oklahoma.

2.9 40 302 Specific condition drawings and written instructions for specific jobs.

2.9 40 303 Deliver Sealed Plans and Specifications to the Department of Central Services, Construction and Properties Division prior to execution of Standard Form of Agreement Between Owner and Contractor as required for individual projects.

2.9 40 400 Fire Marshall Review

2.9 40 401 Deliver Review to the Department of Central Services, Construction and Properties Division prior to execution of Standard Form of Agreement Between Owner and Contractor as required for individual projects.

2.9 40 500 Provide Architectural Plans and Specifications with Professional Seal for all projects in excess of one hundred and fifty-eight thousand dollars, ($158,000.00) or when complexity of work requires.

2.9 40 501 Plans and Specifications to be Sealed by an Architect, licensed by the State of Oklahoma.

2.9 40 502 Specific condition drawings and written instructions for specific jobs.

2.9 40 503 Deliver Sealed Plans and Specifications to the Department of Central Services, Construction and Properties Division prior to execution of Standard Form of Agreement Between Owner and Contractor as required for individual projects.

2.9 50 500 Contractor's per diem costs for work outside major population areas.

2.9 50 501 Per diem costs are based on one person (worker) per day, excluding travel. [For example, if an eight-person crew is contracted to work 10 days at a worksite outside the metropolitan area, a per diem of $40 would be $40 x 8 workers x 10 days, or 3,200.]

2.9 50 502 Major population areas are defined as a fifty mile radius from the center of the designated town in each area: For Area One is Enid, Area Two is Tulsa, Area Three is McAlister, Area 4 is Lawton and Area five has no available per diem.

2.9 60 100 Contractor's per diem/costs for asbestos abatement planning.

2.9 60 101 All roofing abatement work shall be done in strict accordance with all applicable Federal, state and local regulations, standards, codes, and ordinances that govern asbestos abatement and removal.

2.9 60 102 The most recent addition of any relevant regulation, standard, codes, and ordinances shall be followed. Where there is conflict among the documents, the most stringent shall be used, unless such use, due to the conflict, puts the district at risk.

2.9 60 103 The Contractor shall assume full responsibility and liability for any subcontractor's compliance

with all applicable laws, especially pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying adjacent areas to the roofing site.

2.9 60 104 The Contractor will provide the state agency/facility with a notarized statement, signed by an officer of the subcontractor, that contains the following information: 1) a record of any citations issued by Federal, state, or local regulatory agencies relating to asbestos abatement activities, including projects, dates, and resolutions; 2) a list of any penalties incurred through noncompliance with asbestos abatement project specifications including liquidated damages, overruns in scheduled time limitations and resolutions; 3) a list of any asbestos-related proceedings that are currently in progress. The state agency/facility shall have the right to request the prime secure another subcontractor, if any asbestos-related problem was not resolved in a satisfactory manner.

2.9 60 105 The Contractor shall present to the state agency/facility a list of specific requirements that the subcontractor agrees to follow, including a list of Occupational Safety and Health Administration (OSHA) Title 29 regulations and a list of Title 40 codes from the Asbestos Hazard Emergency Response Act (AHERA) and the National Emission Standard for Hazardous Air Pollutants (NESHAP) regulations.

2.9 60 106 The plan shall identify all abatement materials and equipment to be used in the roof repair or restoration project.

2.9 60 107 All necessary protective clothing, personal respirators, scaffolding, ladders, and other equipment shall be approved by the district prior to abatement. The plan shall identify when respirators must be used. A respirator must be used during removal and disposal activities. All OSHA rules for the use of respiratory protective equipment must be followed. Workers with beards or unshaven faces will not be permitted to wear half-face respirators, as per OSHA, NIOSH and EPA standards.

2.9 60 108 Prior to the start of any removal activity that involves asbestos, the Contractor and the state agency/facility shall approve a pre-construction checklist that provides detailed information about the scope of work, including the following: 1) how the work area will be prepared; 2) protective equipment and clothing to be used; 3) proof that all workers involved in asbestos removal are certified; 4) decontamination procedures for personnel, as needed; 5) abatement procedures to be used; 6) procedures for handling and disposing waste material, final decontamination and cleanup work; 7) job safety, bathroom and sanitary facilities, including on-site shower; 8) site security; 9) record-keeping needs for officials; 10) hold harmless agreements to be signed by those involved.

2.9 60 109 All NESHAP and other regulation filing fees will be submitted to the appropriate agency at the time of notification or filing and are the responsibility of the Contractor. The state agency/facility will reimburse the Contractor upon proof of fee payment (photocopy of check or equivalent).

2.9 60 110 Contractor will provide copies of original training certificate and most recent refresher certificate for each employee assigned to work on any abatement. Contractor will be responsible for cross-referenced checking of sub contractor's certificated employees by picture I.D. (driver's license/photo bank card).

2.9 60 111 Since roof abatement does not confine workers in an enclosed work area, only those rules regulations, and standards that are applicable to roof asbestos abatement will be enforced. However, the Contractor must include in the written abatement plan all necessary protective measures and practices that minimize worker exposure while on the roof or while working with asbestos materials, including, but not limited to: 1) engineering controls; 2) work practices; 3) respirators; 4) hygiene facilities; 5) protective clothing; 6) decontamination procedures; 7) emergency procedures; 8) waste disposal procedures. These items should be reflected in the pre-startup checklist. (See 2.9 70 108).

2.9 60 112 Contractor will require any subcontractor to provide medical monitoring to any employee or agent (whether or not that agent is working for the subcontractor, the Contractor, or the state agency/facility) exposed to asbestos in excess of background levels during any phase of the abatement process. All medical reports will be in full compliance with OSHA medical surveillance requirements.

2.9 60 113 The Contractor shall coordinate with the state agency/facility to notify occupants near the work area who may be disrupted by the roof abatement prior to job commencement. Person downwind from the roof abatement site will be moved to a safe location.

2.9 60 114 Any additional insurance or bonding costs associated with asbestos abatement will not be the responsibility of the state agency/facility. Such costs are a normal business expense of the Contractor and will be covered in the bid response.

2.9 60 115 Contractor may base planning costs upon results of core testing (2.9 10 100) and roof scans (2.9 20 100-200).

2.9 70 100 Asbestos abatement activities, removal and disposal of waste

2.9 70 101 If required by authorities, Contractor will run baseline air samples and area samples prior to and during abatement with printed results given to the state agency/facility.

2.9 70 102 Construction area will have the perimeter roped off with warning or caution tape, as required by OSHA. Asbestos warning signs in English and Spanish (or in the language of the Native American tribe if work is performed on a reservation) will be placed as required by law.

2.9 70 103 Any daily sign-in sheets required by law will be maintained at the worksite.

2.9 70 104 Workers will wear personal protective equipment at all times during abatement. An on-site shower shall be available for workers, unless the use of a double suit meets all legal requirements.

2.9 70 105 Prior to roof abatement, one layer of 6 mil polyethylene must be secured to the ground and walkways around the perimeter of the building. This layer must extend no less than six feet out from the building. No asbestos-containing materials may be removed from the roof until it is properly wrapped or contained.

2.9 70 106 No roofing material containing asbestos may be thrown from the roof to the ground or into a dumpster. A fully contained and lined chute, or a block and tackle system to gently lower materials to the ground, may be used.

2.9 70 107 All OSHA and NESHAP regulations pertaining to safety of workers and emissions must be followed.

2.9 70 108 After passing final visual and air tests, waste may be loaded and job site turned over to workers scheduled to repair or restore the roof. Reestablishment of the work area shall occur only after cleanup procedures and air monitoring has been documented to the satisfaction of the state agency/facility. All polyethylene barriers shall be removed and disposed of as required by regulations. No debris shall be buried or burned on the property of the district.

2.9 70 109 All waste is to be hauled by a hauler with all required state and local licenses. No disposal-bagged materials may be transported on an open truck. All disposed materials must have the necessary labels and be contained in leak proof 6-mil disposal bags or fiberboard drums.

2.9 70 110 Disposal must occur at a site authorized by the State of Oklahoma and that has met all regulatory requirements. All dump site receipts, trip tickets, transportation manifests or other documentation of disposal shall be kept by the Contractor. The Contractor shall provide the State Agency using this Contract with a complete record of the disposal process, including the names and addresses of the subcontractors, disposal site operator, and hauler. The location of the disposal site(s) and he estimated quantity of asbestos waste shall be included in this report.

3.0 ROOF MANAGEMENT SERVICES

3.1 10 100 Perform annual roof inspections that includes a written report on any anomalies found, their location and course of action.

3.1 20 100 Perform semi-annual roof inspections that includes a written report on any anomalies found, their location and a course of action.

3.1 30 100 Set up and maintain a computerized roof management program that provides at a minimum the following:

3.1 30 101 Maintain a historical data sheet on each building's roof area.

3.1 30 102 Provide a scaled roof plan for each building area showing the perimeter edge, drains and roof top equipment.

3.1 30 103 Maintain a copy of all roof warranties.

3.1 30 104 Maintain a file on all expenditures for repairs or replacement on each roof.

3.1 30 105 List roof areas by roofing system type.

3.1 30 106 List roof areas by insulation type.

3.1 40 100 Leak investigation by two man crew, up to and including on-site repair with written report.

4.0 EMERGENCY RESPONSE TIME

4.1 10 100 Emergency Response Time is defined as, "Response to an Agency's request for service within (24) clock hours of the initial call/request for service." No bid required as cost is a percentage (10%) of emergency service invoice

5.0 ADDITIONAL ITEMS

5.1 10 100 Dump fees
5.1 10 101 (0) to (50) miles round trip.
5.1 10 102 (51) to (100) miles round trip.
5.1 10 103 In excess of (100) miles round trip.

5.1 20 100 Furnish Crane, hydraulic, minimum 100 foot boom
5.1 20 101 Deliver and pick-up hydraulic Crane from job site.
5.1 20 102 Should damage occur from operation, return to original condition.

5.1 20 200 Furnish Forklift, reach
5.1 20 201 Deliver and pick-up forklift from job site.
5.1 20 202 Should damage occur from operation, return to original condition.

5.1 20 300 Furnish Man lift, articulated
5.1 20 301 Deliver and pick-up man lift from job site.
5.1 20 302 Should damage occur from operation, return to original condition.

5.1 20 400 Furnish Smokeless kettle
5.1 20 401 Deliver and smokeless kettle from job site.
5.1 20 402 Should damage occur from operation, return to original condition.

5.1 20 500 Furnish external stair tower
5.1 20 501 Erect tower up to five stories high for duration of project.
5.1 20 502 To be OSHA compliant, complete with stair treads and safety rails.
5.1 20 503 To be erected by certified installer
5.1 20 504 Bottom of to be enclosed with plywood to height of 8" feet
5.1 20 505 Gate to be locked to discourage unauthorized use
5.1 20 506 Remove after project completion
5.1 20 507 Building attachment points to be repaired
5.1 20 508 Landscaping will be returned to original condition

5.1 20 600 Furnish, set-up and tear down stockade fence
5.1 20 601 Fence to be made of white wood or better
5.1 20 602 To have three each, 2" by 3" cross supports
5.1 20 603 Fence posts set in ground, braced or anchored with a minimum of 8' apart
5.1 20 604 To be locked to discourage unauthorized use when applicable
5.1 20 605 Landscaping will be returned to original condition

5.1 20 700 Furnish, set-up and tear down eight foot stage of scaffolding
5.1 20 701 To be OSHA compliant, complete with safety railings and toe boards.
5.1 20 702 To be erected by certified installer.
5.1 20 703 Roof protection will be provided when applicable.
5.1 20 704 Landscaping will be returned to original condition when applicable.

5.1 20 800 Furnish Safety Monitor on roof
5.1 20 801 Monitor sole purpose is to ensure employee safety

5.1 20 850 Furnish Safety monitor for traffic
5.1 20 851 Monitor sole purpose is to ensure employee safety

5.1 30 100 20-year no-dollar limit State of Oklahoma Roof Warranty up to 10,000 square feet.
5.1 30 101 Contractor shall, during the second and fifth year of this warranty, inspect and provide a written executive summary of these inspections for the state agency/facility and CAP.

5.1 30 200 20-year no-dollar limit State of Oklahoma Roof Warranty exceeding 10,000 square feet.
5.1 30 201 Contractor shall, during the second and fifth year of this warranty, inspect and provide a written executive summary of these inspections for the state agency/facility and CAP.

5.1 40 100 10-year no-dollar limit State of Oklahoma Roof Warranty up to 10,000 square feet.
5.1 40 101 Contractor shall, during the second and fifth year of this warranty, inspect and provide a written executive summary of these inspections for the state agency/facility and CAP.

5.1 40 200 10-year no-dollar limit State of Oklahoma Roof Warranty exceeding10,000 square feet.
5.1 40 201 Contractor shall, during the second and fifth year of this warranty, inspect and provide a written executive summary of these inspections for the state agency/facility and CAP.

END OF SPECIFICATIONS