Appendix A – Bid Package #1 – ADMINISTRATION BLDG (Sections A, B & C)

PART 1 - GENERAL

1.01 SCOPE OF WORK (STEEP SLOPE)

A. Furnish all labor and material for the roof system removal and replacement to include replacement of Architectural roof shingles down to the structural deck: to include synthetic base ply felt and existing ice dam protection membrane over all surfaces to be shingled; Replacement of all severely deteriorated wood decking as indicated by excessive deflection, warping and rotting. Removal of associated metal edge details. The shingle replacement project shall include the installation of the following: new #4 lead flashing for soil stacks, new sheet metal drip edge and or rake edge. Installation 30-year "CertainTeed Architecture laminated self-sealing fiberglass asphalt roof shingle" system on all sloped plywood deck areas. Installation of synthetic roofing underlayment over all shingle roof areas; Removal of the existing Built Up Roof system down to the Metal deck substrate and the installation of a new 60 Mil PVC roofing system to underlying polyisocyanurate.

B. Successful contractor will work in conjunction with Straight up Solar in re-installing the Solar Panel structural supports on steep slope roof area.

- C. Steep slope scope of work includes:
 - 1. Removal and replacement of roof system and roofing felt down to the structural deck.
 - 2. Removal of all existing soil stack flashing boots.
 - 3. Removal of all deteriorated wood as needed.
 - 4. Installation of the following:
 - a. One layer synthetic roofing underlayment over all shingle roof areas.
 - b. New Ice and Water Shield roughly 6' from the perimeter edge.
 - c. New 4# lead stacks flashing around all soil stacks.
 - d. Install new metal fascia detail with 26 ga. Kynar coated metal fascia.
 - e. Installation of new sheet metal drip edge around entire perimeter of building (color to match existing).
 - f. Replace all gutters and downspouts with 24 ga. Kynar coated sheet metal.
 - g. Installation 30-year CertainTeed Architecture laminated self-sealing fiberglass asphalt roof shingle system on all sloped plywood deck areas.
 - 1) Six (6) nails per tab.
 - 2) Apply 1" diameter spots of asphalt roofing cement under each tab corner.
 - 3) Acceptable manufacturers: CertainTeed.

1.02 SCOPE OF WORK (LOW SLOPE)

A. Removal of existing roofing system down to steel deck. The replacement of deteriorated decking where needed. Furnish and install: Installation of NEW SA vapor barrier to primed metal deck as required. Furnish and base layer of 1.5" polyisocyanurate mechanically fastened with FM 1-90 pattern (minimum 16 fasteners per 4x8). Installation of 1/4" in 12" tapered polyisocyanurate insulation layer and one ½" HD polyisocyanurate cover board layer adhered with low rise foam with FM 1-90 ribbon method, staggered 24" minimum. The new roof system shall consist of a heat welded Single-Ply, Thermo-Plastic, fully adhered PVC membrane system, separate piece PVC membrane flashing installation and allied metal component installation. 24 ga. PVC coated metal fascia detail at perimeter edge, 24 ga. counter flashings. Installation of new PVC coated through wall scuppers and related components. Installation of new 24 ga. Control heads with down spouts. Paint all gas lines yellow.

- B. Low slope scope of work to include:
 - 1. Removal and replacement of existing roof membrane, membrane flashing and allied components down to the steel deck system. Removal of all drain components except for fixed drain bowls. Replace any missing or broken roof drain components with new metal components.
 - 2. Removal and replacement of all metal roof edge/fascia systems on all sections.
 - 3. Existing exhaust units with curbs higher than 8" above finished roof do not have to be lifted for flashing installation.
 - 4. Installation of the following:
 - 5. Install SELF ADHERED vapor barrier on over the prepared metal decking. In conjunction with Self-Adhered Vapor Barrier, seal all penetrations and perimeter with vapor retarder / air barrier.
 - a. Mechanically fasten with FM 1-90 (16 fasteners minimum) (1) base layer of 1.5" Poly Iso through VB.
 - b. 1/4" in 12" slope tapered polyisocyanurate board insulation adhered with low rise foam with FM requirements.
 - c. One layer of ½" HD polyisocyanurate board adhered with low rise foam adhesive, stagger all joints.
 - d. 24 ga. Kynar coated metal counterflashing at curbs and scuttle hatches.
 - e. 24 ga. Kynar coated metal counterflashing at walls.
 - f. 24 ga. PVC coated fascia detail at all perimeter fascia edges. Ensure there is a protective barrier separating the new metal detail from the existing copper wall detail.
 - g. INSTALLATION OF NEW LETTERING ON THE FRONT ENTRANCE TO MATCH EXISITING.
 - h. PVC coated through wall scuppers.
 - i. Installation of new 24. Ga control heads and down spouts.
 - j. PVC flashing boots on soil stack projections.
 - k. Protection pads around all unit curbs requiring maintenance, (anything with a motor,).
 - I. Replacement of pitch pans with preformed flashing wherever possible.
 - m. Pre-manufactured polyisocyanurate four (4) foot sumps at roof drains and scuppers; use premanufactured six (6) inch "feather edge" where necessary for smooth transition to drain bowl.
 - n. 1/2 inch per foot tapered crickets behind rectangular curbs, between roof drains, and roof drains and end walls adhered with low rise foam adhesive.
 - o. Pre-manufactured six (6) inch "feather edge" at cricket/saddle down slope terminations
- C. Installation of:
 - 1. Roof Membrane
 - Description: .060" PVC membrane
 - 2. PVC Flashing Membrane (Separate membrane from roof membrane) Description: .060" PVC membrane
 - 3. PVC Bonding Adhesive Description: Solvent-based, formulated for compatibility with the THERMO-PLASTIC membrane and a wide variety of substrate materials, including masonry, wood, insulation facings.
 - 4. Heat weld at laps.

1.03 SUBMITTALS

- A. Submit at Pre-Job Conference:
 - 1. Product data:
 - a. Product data sheets.
 - b. Material safety data sheets.

- c. Shop drawings or samples of metal flashings, showing exact profile, lengths, joints, terminations, and methods of attachment.
- 2. Gantt (or equal) progress chart to project completion, identifying all segments of work, with appropriate timetables.
- 3. Do not order project materials or start work before receiving contract/purchase order for this project work.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Delivery of materials:
 - 1. Deliver materials to job-site in new, dry, unopened, and well-marked containers showing product and manufacturer's name.
 - 2. Deliver materials in sufficient quantity to allow continuity of work.
 - 3. Coordinate delivery with Clayton School District Representative.
- B. Storage of materials:
 - 1. Discard rolls that have been flattened, creased, or otherwise damaged. Place materials on pallets. Do not stack pallets.
 - 2. Stack insulation on pallets.
 - 3. Store materials marked "keep from freezing" in areas where temperatures will remain above 40°F.
 - 4. Neatly stack wood on dunnage.
 - 5. Remove plastic packaging shrouds. Cover top and sides of all stored materials with canvas or plastic reinforced tarpaulin (not polyethylene). Secure tarpaulin.
 - 6. Rooftop storage: Disperse material to avoid concentrated loading.
 - 7. Cover top and sides of all exterior stored materials with canvas tarpaulin (not polyethylene). Secure tarpaulin.
 - 8. No materials may be stored in open or in contact with ground or roof surface.
 - 9. Should Contractor be required to quickly cover material temporarily, such as during an unanticipated rain shower, all materials shall be stored on a raised platform covered with secured canvas tarpaulin (not polyethylene), top to bottom.
 - 10. Contractor shall assume full responsibility for the protection and safekeeping of products stored on premises.
- C. Material handling:
 - 1. Handle materials to avoid bending, tearing, or other damage during transportation and installation.
 - 2. Material handling equipment shall be selected and operated so as not to damage existing construction or applied roofing. Do not operate or situate material handling equipment in locations that will hinder smooth flow of vehicular or pedestrian traffic.

1.05 SITE CONDITIONS

- A. Field measurements and material quantities:
 - 1. <u>Applicator shall have SOLE responsibility for accuracy of all measurements</u>, estimates of material quantities and sizes, and site conditions that will affect work.
- B. Existing conditions:
 - 1. Building space directly under roof area covered by this specification will be utilized by ongoing operations. Do not interrupt Clayton School District operations unless written approval is received from Clayton School District Representative.

- 2. Access to roof shall be from exterior or preapproved access area. No roofing employees will be allowed within building unless otherwise stated at preconstruction meeting, except for interior protection and cleanup of roofing and roofer related debris.
- 3. Exhaust units and other equipment shall be moved and/or raised as required to install roofing materials complete and in accordance with plans and specifications. When units and equipment are to be moved, they shall be carefully disconnected and moved to a protected area so as not to damage any part or component the roof and shall be reconnected in such a way that they are restored to a prior operating condition. All work is the responsibility of the Contractor and is to be <u>coordinated and approved by Clayton School District Representative before proceeding</u>.
- 4. All disconnection and re-connection shall be performed by a mechanical and/or electrical company licensed to perform such work and shall be the responsibility of the Contractor.
- 5. Appropriate measures shall be taken to prevent vapors, gases, or odors from entering the building during roof removal, replacement or repair.
- 6. Abandoned equipment, sheet metal, curbs, debris shall be removed by the Contractor on a daily basis.
- C. Environmental requirements:
 - 1. Do not work in rain, snow, or in presence of water.
 - 2. Do not work in temperatures below 40° F.
 - 3. Do not install materials marked "keep from freezing" when daily temperatures are scheduled to fall below 40° F.
 - 4. Do not perform masonry work below 35° F. Make proper provisions to protect work from freezing 48 hours after installation if work is performed between 35° F. and 45° F.
 - 5. Remove any work exposed to freezing.
- D. Safety requirements:
 - 1. Fall protection measures shall be incorporated into this roof project, as found in the Code of Federal Regulations 29 Part 1926, Subpart M Fall Protection, effective February 6, 1995.
 - 2. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
 - 3. Comply with federal, state, local and Clayton School District fire and safety requirements.
 - 4. Advise Clayton School District Representative whenever work is expected to be hazardous to Clayton School District employees and/or operators.
 - 5. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.
 - 6. Maintain fire extinguisher within easy access whenever power tools, hot air welders, and torches are being used.
 - 7. Advise Clayton School District Representative when volatile materials are to be used near air ventilation intakes so that they can be shut down or blocked.
 - 8. Do not work after dark.
- E. Security Requirements:
 - 1. Comply with Clayton School District security requirements.
 - 2. Provide Clayton School District Representative with current list of accredited persons scheduled to work on the project.
 - 3. Require identification be displayed by all persons employed by Contractor while physically working on this project at all times while on Clayton School District property.
- F. Temporary sanitary facilities:
 - 1. Furnish, install, <u>and maintain</u> temporary sanitary facilities for employee use during project. Remove on project completion.

2. Place portable toilets in conformance with applicable laws, codes, and regulations.

1.06 CONSTRUCTION PROJECT SAFETY

- A. GENERAL
 - 1. Description:
 - a. Work Included:

To assure the work site environment is safe for the employees of all contracts, subcontract inspectors, and building occupants. This section has been written to identify and underline the importance of safe working conditions. If any conflict should arise over a specific provision or rule, the laws and rules governing that specific location shall be followed.

- 2. Related Work:
 - a. Additional safety items may be found in the individual technical sections.
- 3. Standards:
 - a. Occupational Safety and Health Act of 1970.
 - b. 29 CFR Part 1926, Subpart M Fall Protection.
 - c. State, County, and City requirements, as applicable.
- 4. Quality Assurance:
 - a. Contractor shall have sole responsibility in seeing that the job site is safe, whether the Clayton School District Representative or Consultant is present on the project. Contractor shall appoint a "competent person" to be present on the project who will have authority to make decisions regarding safety and health issues on the Contractor's behalf.
- 5. Submittals:
 - a. Contractor shall submit Material Safety Data Sheets for materials to be used on the project.

B. PRODUCTS

- 1. Materials and Equipment:
 - a. General: Contractor shall supply all necessary material and equipment required to complete the work in a manner consistent with a safe work site, and as required by regulatory agencies.
 - b. All equipment used on the project shall be in a safe operating condition and be maintained in a safe condition for the project duration. Equipment found to be unsafe or in disrepair will be repaired and made safe, or will be removed from the job site, and replaced if necessary, at no cost to the Clayton School District.
 - c. Disposal of any solvents, containers, and other regulated materials shall meet all applicable laws.

C. EXECUTION

- 1. General: The safety requirements listed here are by design broad in nature. The Contractor will augment as necessary the information contained in this section with more specific information from OSHA and roofing industry requirements.
- 2. Contractor Employee Training:
 - a. Contractor will provide adequate training for employees to ensure their safety and the safety of others on the project site. Provide instruction in the proper operation of power tools, hoisting equipment, kettles, tankers, and other pieces of equipment employees will be required to use in the completion of the work.
 - b. One (1) employee per job crew is required to have received Red Cross Training.
 - c. Ensure each worker is aware of job and site specific hazards, and the safety precautions appropriate to each.

- d. Contractors shall present a safety and loss prevention orientation program to each new employee before that employee starts work.
- e. Contractors and subcontractors shall inform their employees of all safety and health rules pertaining to their particular job.
- f. Contractors and subcontractors shall inform their employees of location and use of safety devices such as first aid kits, phones, fire extinguishers, etc.
- g. Contractors shall implement a regular system of work inspection to detect and correct hazardous conditions, safety rule violations and unsafe working practices.
- 3. Accident Reporting:
 - a. The proper reporting and investigating of accidents is necessary for all contractors and subcontractors. An accident report and investigation shall be immediately made out by the foreman in charge, reviewed and approved by the contractor. Contractor <u>shall</u> <u>provide to the Clayton School District</u> a copy of the Completed Accident Report, Employer's First Report of Injury or Illness or such other similar reports required by federal, state, county and municipal or local safety laws. All record keeping requirements will be in accordance with OSHA.
- 4. First Aid:
 - a. Contractors and subcontractors shall be responsible for providing first aid and medical treatment for their employees. The name, address and telephone number of contractor's and subcontractor's doctors, hospital and ambulance services shall be conspicuously posted, as required by law.
 - b. An OSHA approved first aid kit will be located at all times on the job. It shall be conspicuously located and readily accessible at all times. The unit shall be of an appropriate size for the roofing crew.
- 5. Individual Conduct and Safety:
 - a. Contractor's and subcontractor's employees shall be made aware of and comply with the following rules which will be in effect on all job sites.
 - b. Alcoholic beverages and illegal drugs will not be permitted. Employees entering job site under the influence or in possession of alcohol or drugs shall be subject to removal from the job site. The carrying of firearms and <u>all other weapons</u> is prohibited. Fighting, gambling, stealing, soliciting and horseplay will not be tolerated. Abusive language or disrespectful behavior in public areas will not be tolerated. **No Smoking.**
- 6. Employees shall be made aware of any job site alarm, code signal, appropriate responses, and the requirements for actions that will be needed to be taken.
- 7. Protective Equipment and Clothing:
 - a. The contractor shall furnish and require the use and wearing of proper protective devices and personal protective equipment by its employees.
 - b. Approved eye and face protection should be worn when warranted by the exposure. Safety glasses are required in all circumstances where there is an exposure to flying particles. Side shields offer additional protection. Plastic face shields should be worn for guarding against flying particles and spraying liquids or corrosives.
 - c. Appropriate clothing and eye protection shall be worn when working with chipping or tear off equipment.
 - d. Hard hats must be worn at all times whenever there is a possibility of head injury from impact, flying or falling objects.
- 8. Housekeeping:
 - a. The contractor or subcontractor shall maintain good housekeeping standards at all times as an integral part of his work. <u>Daily cleanup of work, lay-up, and personnel areas is</u> required, and must be performed.
 - b. **Daily cleanup** of any roofing and/or roofer related debris to the interior of the building is required.

- c. Materials shall be piled so that safe clearances are maintained and topping or movement is prevented. Loose materials on the roof must be secured so that they cannot be blown or bumped off.
- d. Accumulation of material that may create a fire hazard is not permitted. Never store excessive amounts of material in one place to overweigh the roof.
- e. Roof areas are to be <u>"watertight at night" at all times during the job.</u> Contractors or subcontractors failure to do so can be grounds for dismissal.
 - 1) Roofing Contractor will be held liable for any and all damage to occupied areas and its contents resulting from his work or negligence.
 - 2) Roofing Contractor is required to respond within two (2) hours for any leak occurring to the interior. The leak will be repaired, or measures taken to ensure that operations are not interrupted until the leak can be repaired and clean-up is affected inside the building.
- 9. Signs and Barricades:
 - a. When it is necessary to barricade an area for overhead work, to protect personnel from hazardous operations, or to move equipment or cranes, barricades are to be provided by the contractor or subcontractor. Barricades must be erected before the work requiring them begins. If the barricades are in a roadway or walkway, blinking lights must be used after dark. When the work is completed, the barricades must be removed from the job site.
 - b. Contractors or subcontractors are forbidden to remove posted signs. All barricades must be scheduled and approved by Clayton School District Representative before erection.
 - c. A warning line system, as described in 29 CFR 1926 Guarding of Low-Pitched Roof Perimeters, for protection of employees will be erected by contractors or subcontractors on roofs with pitch less than 4:12 with roof height of more than 16 feet and width of 50 feet or more. The warning line will consist of rope, wire or similar material, flagged with highly visible material at 6 foot intervals which must be installed 42 to 45 inches above the roof and be able to take 16 pounds of pressure against the rope before falling over.
 - d. Inspect all rigging equipment prior to use (chains, ropes, slings, shackles, etc.)
 - e. Ground fault detectors or an assured equipment guarding conductor program are to be used on all job sites as required by Law, Section 1926-400 (h), (1), (2), an (3).
- 10. Ladders:
 - a. Contractors and subcontractors shall provide good ladders on the job. Ladders with split or cracked side rails and damaged rungs will be removed. They should be tagged "out of service" until they are fixed. Ladders in doorways, walkways or other congested areas must be barricaded or guarded.
 - b. Ladders should be of adequate length and must extend at least three feet above the upper landing.
 - c. Place straight ladders on solid, level footings with the foot of the ladder in a minimum distance from the wall equal to one fourth the length of the ladder from the resting point.
 - d. Straight ladders shall have non-skid feet and be securely tied off.
 - e. Face the ladder and use both hands going up or down.
 - f. Do not climb or descend ladders with tools, equipment or material in your hands.
 - g. Metal ladders must not be used near, or for electrical service.
- 11. Fire Protection:
 - a. Fire extinguishers must be located at all times on the job site. A fire extinguisher rated not less than 2A shall be provided for each <u>3,000 sq. ft</u>. of the roof area under construction. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 75 feet.
 - b. Extinguishers that are in poor condition, not an appropriate size, or have been discharged will be required to be replaced.

- c. Smoking is prohibited on the entire Clayton School District Campus. <u>If caught</u> <u>smoking you will be asked to leave the job site immediately</u>.
- d. All flammable liquids will be required to be stored in approved safe containers. Contents will be described and marked flammable.
- e. Storage in excess of 10 gallons of flammable liquids on the roof will not be permitted.
- f. When using flammable liquids to clean, dispose of the rags in OSHA approved containers, or they should be removed from the roof daily to prevent possible spontaneous combustion.
- g. Never store bulk flammable material or liquids closer than 25 feet from open flames or other source of ignition.
- 12. Crane and Hoist:
 - a. Contractor shall comply with the manufacturer's specifications and limitations. Rated load capacities, recommended operating speeds, and special hazard warnings or instructions shall be conspicuously visible from the operator's station.
 - b. Accessible areas within the swing radius of the rear of the rotating superstructure shall be properly barricaded to prevent the public or employees from being struck or crushed by the crane.
 - c. All crawler or truck cranes in use shall meet the requirements as prescribed in the ANSI B30-5-1968 Safety Code for Crawler and Truck Cranes.
- 13. Tear-off /Set-up Procedures:
 - a. The following guidelines shall be followed when setting up roof debris site:
 - 1) Guard rails shall be installed on either side of demo roof site on the roof level 6 feet from opening. Guard rails shall be installed according to OSHA standards.
 - 2) A substantial gate shall be installed at unloading roof area for debris. A competent person shall be assigned to control the operation of the gate, and the disposal of trash down.
 - 3) Where the material is dumped from mechanical equipment or wheelbarrows, a securely attached toe-board or bumper, not less than 4 inches thick and 6 inches high, shall be provided at each chute.
- 14. Public Liability:
 - a. Unauthorized persons are not allowed access to the roof at any time. Contractor shall control access to the roof.
 - b. Barricades and signs should be posted on the ground around the work area to warn the public.
 - c. Locate air intake ducts, air conditioners or air pumps. Notify Clayton School District Representative when dust or fumes may be drawn into the facility so that the unit may be shut down or covered.
 - d. At night, lock and secure trucks, deactivate hoisting equipment and take down ladders.
 - e. Park vehicles so that they do not pose a hazard to other traffic moving around the job site. Trucks and equipment should not block sidewalks or other pedestrian's travel ways without providing a clear, well-marked, alternate route of travel.

1.07 SUBSTITUTIONS

- A. When a particular make or trade name is specified, it shall be indicative of standard required. Bidders proposing substitutes shall submit following five (5) days prior to bid date to Clayton School District and RMT Inc.:
 - 1. Written application with explanation of why it should be considered.
 - 2. Accredited testing laboratory certificate comparing substitute's physical/performance attributes to those specified.
 - 3. Three (3) job references available for inspection within fifty (50) miles of Clayton School District where substitutes were used under similar conditions.

- 4. Only substitutes approved in writing by Clayton School District prior to scheduled bid date will be considered.
- B. Notification of approvals will be mailed at least three (3) days before bid opening.
- C. Clayton School District reserves right to be final authority on acceptance or rejection of any substitute.

1.08 PAYMENT SECURITY

- A. Payment and Performance Bond:
 - 1. Clayton School District will require the successful Contractors to furnish and pay for a Performance Bond and a Labor and Material Bond, each in an amount equal to and not less than 100% of the Contract Sum. Cost of Bonds shall be included in the Bidder's Base Bid.
 - 2. The bonds are to be executed by any acceptable surety company or companies, acceptable to Clayton School District, authorized to execute such in the State of Missouri written in favor of Clayton School District.
- B. Progress payments:
 - 1. Contractor shall establish with Clayton School District and RMT Inc., procedure for payment and retainages prior to commencement of work on this project.
 - 2. All pay requests shall be through the offices of RMT Inc.
 - 3. Partial or progress payments shall not relieve contractor of performance obligations under this contract, nor shall such payments be viewed as approval or acceptance of work performed.
 - 4. Final payment shall be withheld until all provisions of the specifications are met.

1.09 UNIT PRICES

- A. Quote unit prices on:
 - 1. As identified on the Proposal Form.

1.10 WARRANTY/GUARANTEE

- A. Guarantee:
 - 1. Upon project completion, Consultant and Clayton School District. Representative acceptance, and before final payment can be made, Contractor shall submit signed written guarantee for the installation of roofing and flashing to be watertight for a period of two (2) years from the date of completion of the roof replacement project. The Contractor shall make all repairs during this two (2) year period to maintain the roof watertight and in conformance with these Specifications without additional cost to the Clayton School District.
 - 1) All blisters, bubbles, open laps, wrinkling of membrane roofing and flashings, and other defects shall be repaired by the Contractor at his own expense.
 - 2) If, within 24 hours after notification of roof leakage, the Contractor has not responded, Clayton School District. Representative shall have the right, without invalidating this guarantee, to make any temporary repairs that are required in order to protect the building and the contents of the building from damage due to the roof leaking.
- B. Warranty:
 - 1. Upon project completion, Consultant and Clayton School District acceptance, and before final payment can be made, Contractor shall deliver to Clayton School District a twenty (20) year Manufacturer's Roofing System Warranty against leaks as a result of workmanship and/or materials.

PART 2 - PRODUCTS

2.01 GENERAL

A. Comply with quality control, references, specifications, and manufacturer's data.

2.02 ACCEPTABLE MANUFACTURER

- A. Versico
- B. Sika/Sarnafil
- C. CertainTeed

2.03 ROOF DECKING

- A. Steel
- B. OSB Over insulation.

2.04 INSULATION

- A. Tapered polyisocyanurate insulation boards:
 - 1. FS HH-I-1972/2(1), Class 1; polyisocyanurate insulation.
 - 2. Slope per running foot: 1/4 inch.
 - 3. Compressive strength: 20 psi
 - 4. Flame spread: <25.
- B. High density polyisocyanurate cover board: Closed cell polyisocyanurate foam with coated glass matt facer laminated to both faces, complying with the following additional characteristics:
 - 1. Thickness: 0.5 inches.
 - 2. Size: 48 inches by 48 inches, nominal.
 - 3. R-Value (LTTR):
 - a. 0.5 inches, R-Value: 2.5, minimum.
 - 4. Compressive Strength: 100 psi.
 - 5. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.
 - 6. Recycled Content: 8.3 percent post-industrial, average.
- C. 1.5" Polyisocyanurate board insulation: Closed cell polyisocyanurate foam with black glass reinforced mat laminated to faces, complying with the following additional characteristics:
 - 1. Thickness: 1.5" true thickness.
 - 2. Size: 48 inches by 96 inches, nominal.
 - a. **Exception:** Insulation to be attached using adhesive may be no larger than 48 inches by 48 inches, nominal.
 - 3. R-Value (LTTR):
 - a. 1.0-inch Thickness: 5.56, minimum.
 - 4. Compressive Strength: 20 psi when tested in accordance with ASTM C 1289.
 - 5. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.
 - 6. Recycled Content: 19 percent post-consumer and 15 percent post-industrial, average.
 - Acceptable Product: ISO 95+ GL Polyisocyanurate Insulation by Firestone or approved equal.
 a. Must be a true 2.0 inches thick.

- D. Tapered polyisocyanurate insulation board for crickets/saddles:
 - 1. FS HH-I-1972/2(1), Class 1; polyisocyanurate insulation.
 - 2. Slope per running foot: 1/2 inch.
 - 3. Minimum thickness: 1/2 inch.
 - 4. Compressive strength: 20 psi
 - 5. Flame spread: <25.
- E. Insulation adhesive to base ply and substrate layer insulation:
 - 0. Low rise foam adhesive
 - 2. $\frac{3}{4}$ " thick beads
 - 3. 6" wide bead spacing in the roof field
 - 4. 4" wide bead spacing at perimeter and corners

2.05 MECHANICAL FASTENERS

- A. Wood to wood:
 - 1. Galvanized, common, annular ring nail.
 - 2. Length: Sufficient to penetrate underlay blocking 1-1/4".
- B. Shingle Nails: Standard round wire type roofing nails, corrosion resistant; hot dipped zinc coated steel, aluminum, or chromated steel; minimum 3/8 inch head diameter; minimum 11 or 12 ga. shank diameter; shank to be of sufficient length to penetrate through roof sheathing or 3/4 inch into solid wood, plywood, or non-veneer wood decking. Contractor must not penetrate interior wood roof decking with roofing nails.
- C. One (1) inch cap nails:
 - 1. Type: Spiral or annular ring shank, twelve (12) ga. minimum, with integral one (1) inch cap.
 - 2. Acceptable manufacturers:
 - a. Hillwood Manufacturing Co., Cleveland, OH.
 - b. Hoffler Wire Products Co., Inc., Nevada City, CA.
 - c. Independent Nail, Inc., Bridgewater, MA.
 - d. W. H. Maze Co., Peru, IL.
 - e. National Nail Corp., Grand Rapids, MI.
 - f. Simplex Nails, Inc., Americus, GA.
- D. Galvanized sheet steel to wood blocking and deck sheathing:
 - 1. FS FF-N-105B(3) Type II, Style 20, roofing nails; galvanized steel wire, flat head, diamond point, round, barbed shank.
 - 2. Length: Sufficient to penetrate wood blocking 1-1/4 inches minimum.
- E. Aluminum sheet metal to wood blocking and deck sheathing:
 - 1. FS FF-N-105B(3) Type II, Style 20, roofing nails; 6061-T913 alloy wire, flat head, diamond point, round, barbed shank.
 - 2. Length: Sufficient to penetrate wood blocking 1-1/4 inches minimum.
- F. All Purpose Fasteners, insulation plate
 - 1. Insul-Fixx #12, plastic or metal plate by Fabco RIF, Elyria, OH.
 - 2. Permaseal, coated No. 12 PH deck screw by Powers Rawl.
 - 3. Olympic Fastener #12-10, plastic or metal plate by Olympic Manufacturing Group, Agawam, MA.
 - 4. Permaseal, coated No. 12 PH deck screw by Powers Rawl.

2.06 ROOFING MATERIALS

- A. Asphalt Shingle:
 - 1. ASTM D3018,
 - 2. ASTM D3462
 - Conforming to ASTM D 3018 Type I Self-Sealing; UL Certification of ASTM D 3462, UL 997 110-mph Wind Resistance, and UL Class A Fire Resistance; glass fiber mat base; ceramically colored/UV resistant mineral surface granules across entire face of shingle; full two-layer laminated four-tab shingle, plus additional random tabs.
 - a. 30 year guarantee
- B. Related materials:
 - 1. Ice dam protection:
 - a. ASTM D 1970 sheet barrier of self-adhering rubberized asphalt membrane shingle underlayment having internal reinforcement, and "split" back plastic release film; provide material with warranty equal in duration to that of shingles being applied asphalt mastic.
 - 2. Shingle underlayment:
 - a. Tyvek (or equal) synthetic roofing underlayment.
 - 3. Sealants:
 - a. Coping sealant:
 - 1) FS TT-S-00227E(3), Type II, Class A; multi-component, non-sag epoxidized polyurethane sealant.
 - b. Reglet sealant:
 - 1) Reglet Joint Sealant
 - 4. Lumber:
 - a. Southern Pine; No. 2 grade; free from warping and visible decay; pressure treated with chromated copper arsenate (CCA) to meet AWPB, LP-22, 0.40 retention, and marked.
 - 5. Plywood:
 - a. Plywood shall have a maximum moisture content of 19% by weight on a dry weight basis. Unless kiln-dried after treatment, wolmanized plywood in not acceptable due to moisture content.

2.07 METAL FLASHINGS

- A. Counterflashing and Step Flashing:
 - 1. Kynar coated sheet steel: ASTM A 526-85, 24 gage, thick steel.
- B. Metal Fascia/Control Heads and down spout
 - 1. 22 ga. cleat
 - 2. 24 ga. Kynar coated sheet steel
- C. Plumbing Vents:
 - 1. ASTM B 29-79 (1984), four (4) lb. sheet lead.
- D. Termination bar:
 - 1. Metal-Flash Termination Bar Flashing:
 - a. 1/8 x 1 inch aluminum bar
 - b. 1/8 x 1 inch stainless steel bar.
- E. Termination bar sealant:
 - 1. Metal cleaner: No. 200 Cleaner
 - 2. Metal primer: Primer No. 6

- 3. Reglet joint sealant
- F. Counterflashing:
 - 1. Kynar coated sheet steel: ASTM A 526-85, 26 gage, thick steel.
- G. Flashing boots:
 - 1. Pre-formed flashing boots
 - a. Quick Applied (QA) Pre-formed flashing boots
- H. Work shall be in accordance with Architectural Sheet Metal Manual, Third Edition, as issued by Sheet Metal and Air Conditioning Contractors' National Association, Inc., (SMACNA).

2.08 MASONRY

A. None.

2.09 SYSTEM PERFORMANCE REQUIREMENTS:

A.	LAMINATED SHINGLES Property	Typical Value	Test Method
	Asbestos content Fiberglass reinforcing mat 30 year warranty	None	ASTM D 276-87
	Wind Rating Self-sealing asphalt strip	70 mph	
	Nominal Size:	13 1/4" x 38 3/4"	
	Exposure:	5 5/8"	
	Shingles per Square:	66	
	Bundles per Square:	3 bundles of 22 shingles	
	Coverage per Square:	99.9 sq. ft.	
в.	PVC MEMBRANE		
	Testing	<u>Minimum Values</u>	<u>Typical Values (SI Units)</u>
	Thickness, min, mm (in.)	0.060"+/- 10%	
	Sheet – overall	0.060"+/- 10%	0.060"+/- 10%
	Coating over scrim	0.406" (0.015)	0.406" +/- 10%
	Tensile strength, min, MPa (psi)	1,500	
	Breaking strength, min, kN (lbf)	45	45
	Elongation, ultimate, min, %	NA	
	Elongation at break, min, %	250	270
	Tensile set, max, %	NA	
	Seam strength, % of tensile strength	75	

2.10 VAPOR RETARDER ON STEEL DECKS

- A. SA 32 mil (0.8 mm) self-adhesive vapor barrier that can also serve as temporary roof protection. Self-Adhered is available in rolls 44.9 inches x 133.8 feet (1.14 x 40.8 m).
- B. SA Primer WB A polymer emulsion water based primer designed to improve the adhesion of SA vapor retarder on approved substrates. Application temperature must be 41°F (5°C) and above. The coverage rate will range from 163 400 ft2/gal (4 9.8 m²/L) for non-porous surfaces to 82 135 ft2/gal (2 3.3 m²/L) for porous surfaces. The VOC content is 3 g/L.
- C. SA VB needs to be installed along vertical surface of walls and or penetrations even with base layer of insulation. Perimeter walls need to be caulked along top surface of VB to ensure adhesion to wall substrate.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify conditions as satisfactory to receive work.
- B. Do not begin roofing until all unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions.
- C. Verify that work of other trades penetrating roof deck or requiring men and equipment to traverse roof deck has been approved by Owner, manufacturer, and roofing contractor.
- D. Check projections, curbs, and deck for inadequate anchorage, foreign material, moisture, or unevenness that would prevent quality and execution of new roof system.

E. SOLAR PANEL COORDINATION:

- 1. StraightUp Solar shall test and map the existing array.
- 2. StraightUp Solar shall de-energize and lockout the electrical disconnect switch associated with the solar array.
- 3. StraightUp Solar will remove solar modules, rails, L-feet, and conduit and wiring from the roof surface at the Administration building.
- 4. Modules and rail will be stored in rented storage containers located in the parking lot. Containers will be procured and secured by StraightUp Solar.
- 5. Roofing Contractor shall remove solar attachment points when removing the shingles and save the flashings and components in containers provided by StraightUp Solar for re-use, as appropriate.
- 6. Roofing Contractor shall provide StraightUp Solar's project manager at least 5-businessdays notice of when synthetic underlayment is expected placed on the area of the roof where the solar array will be located to begin scheduling their resources.
- 7. StraightUp Solar will map and install QBases over the synthetic underlayment as shown in the specifications and secure the post with EPDM sealing washer.
- 8. StraightUp Solar shall provide flashings and EPDM collars to the Roofing Contractor to complete the remaining steps of the installation specifications necessary to provide a waterproof seal and warranty to Clayton School District, as required.
- 9. Once roof shingles are completely installed, Roofing Contractor shall coordinate scheduling of re-installation of solar array components with StraightUp Solar project manager.

- 10. StraightUp Solar shall procure and install attachment points and flashings for installation of the conduit supports as part of the work required to reinstall the remaining solar array components.
- 11. StraightUp Solar shall re-energize and test the solar array upon completion.

3.02 GENERAL WORKMANSHIP (SHINGLES)

- A. Substrate: Free of foreign particles prior to laying shingle base roof membrane. Deck surface must be swept prior to felt installation.
- B. Wrapper and packaging materials: Not to be included in roofing system.
- C. Entrapped debris and aggregate: Not permitted within new roof assembly. Its discovery is sufficient cause for rejection.
- D. Mechanical fasteners:
 - 1. Driven manually or mechanically straight with head seated firmly against the shingle surface not cutting or breaking shingle surface.
 - 2. Length: Sufficient to penetrate plywood sheathing thickness through underside 3/4".
- E. Protection:
 - 1. Contractor shall be responsible for installing clear plastic sheeting in those areas where decking will be replaced or repaired.
 - 2. Contractor shall be responsible for covering equipment, floor areas, etc., where dust and debris is falling from deck.
 - 3. Contractor is responsible for immediate clean-up of any dust and debris that falls onto the floor or onto equipment, desks, etc.
 - 4. Contractor shall be responsible for protection of property, interior and exterior, during course of work. Lawns, shrubbery, paved areas, and interior of the building shall be protected from damage. Repair damage at no extra cost to Clayton School District.
 - 5. Contractor shall be responsible for protection of interior (to include personnel, inventory, furniture) contents. Contractor is responsible for identifying and marking off areas on floor below work being conducted on roof.
 - 6. Contractor is responsible for clean-up and posting floor guards and personnel to monitor potential falling debris.
 - 7. Provide at site, prior to commencing removal of debris, a dumpster or dump truck to be located adjacent to building where directed by Clayton School District.
 - 8. Roofing, flashings, membrane repairs, and insulation shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather on that day.
 - 9. Preparation work shall be limited to those areas that can be covered with installed roofing material on same day or before arrival of inclement weather on that day.
 - 10. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement. Move equipment and ground storage areas as work progresses.
 - 11. Protect building surfaces at set-up areas with tarpaulin. Secure tarpaulin. Remove dumpster from premises when full and empty at approved dumping or refuse area. Deliver empty dumpster to site for further use. Upon job completion, dumpster/chute shall be removed from premises. Spilled or scattered debris shall be cleaned up immediately. Removed material to be disposed from roof as it accumulates.
 - 12. Seal base sheet at perimeters, projections, and other roof penetrations at end of each day. **Note:** Base sheet itself, if required in an emergency basis, is not considered adequate waterproofing protection. If base sheet is utilized on an emergency basis, the roof area covered by the base sheet shall be covered the next day with the full contingent of roofing plies.

- At end of each working day, completed segment shall be sealed with water stops along edges to prevent water entry. <u>All projections, penetrations and tie-ins shall be made watertight at</u> <u>the end of each day</u>.
- 14. Cover windows with protective covering prior to removal of roofing material.
- 15. Do not allow debris to fall through deck panel joints.
- F. Deck Surface preparation:
 - Deck to be as clean as possible. Ensure the substrate is in good condition. If deck is wet allow sufficient amount of time for the moisture to dry. <u>No torches to be used to dry deck of</u> <u>moisture!</u>
- G. 1. SA 32 mil (0.8 mm) self-adhesive vapor barrier that can also serve as temporary roof protection. Self-Adhered is available in rolls 44.9 inches x 133.8 feet (1.14 x 40.8 m).
 - a. SA Primer WB A polymer emulsion water based primer designed to improve the adhesion of SA vapor retarder on approved substrates. Application temperature must be 41°F (5°C) and above. The coverage rate will range from 163 400 ft2/gal (4 9.8 m²/L) for non-porous surfaces to 82 135 ft2/gal (2 3.3 m²/L) for porous surfaces. The VOC content is 3 g/L.
 - b. SA VB needs to be installed along vertical surface of walls and or penetrations even with base layer of insulation. Perimeter walls need to be caulked along top surface of VB to ensure adhesion to wall substrate.
- H. Mechanical fasteners roof membrane:
 - 1. Seated firmly in discs or bars with fastener heads flush or below disc's or bar's top surface.
 - 2. Length: Sufficient to engage substrate 11/2 inch.
 - 3. Manufacturer approved and FM I –130 approved.
- Insulation: Form continuous insulation joints parallel to, but not directly over, deck panel joints.
 4'X4' boards only
- J. Base flashing height:
 - 1. Not less than eight (8) inches above finished roof surface.

3.03 PREPARATION

- A. Protection:
 - 1. Contractor shall be responsible for protection of property during course of work. Lawns, shrubbery, paved areas, and building shall be protected from damage. Repair damage at no extra cost to Owner.
 - 2. Contractor is responsible for clean-up and protecting personnel entrances against potential falling debris.
 - 3. Provide at site prior to commencing removal of debris, a dump container or dump truck.
 - 4. Roofing and flashings shall be **installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather.** <u>Complete coverage with shingles is</u> <u>considered watertight</u>.
 - 5. Preparation work shall be limited to those areas that can be covered with installed roofing material on same day or before arrival of inclement weather.
 - 6. Arrange work sequence to avoid use of newly constructed roofing walking surface.
 - 7. Move equipment and ground storage areas as work progresses.
 - 8. Protect building surfaces at set-up areas with tarpaulin. Secure tarpaulin. Remove dump container from premises when full and empty at approved dumping or refuse area. Deliver empty dump container to site for further use. Upon job completion, dump container and tarpaulin shall be removed from premises. Spilled or scattered debris shall be cleaned-up immediately.

Contractor is required to utilize a rolling magnet to pick up scattered nails. Removed

material to be disposed from roof as it accumulates.

- 9. Seal roof system at perimeters, projections, and other roof penetrations at end of each day.
- 10. Cover windows with protective covering prior to removal of roofing material.
- 11. Do not allow debris to fall through deck sheathing joints and penetrations.
- B. Surface preparation:
 - 1. Remove existing roofing shingles.
 - 2. Remove deteriorated plywood deck sheathing.
 - 3. Remove roof and flashings to substrate around roof penetrations.

3.04 CARPENTRY

- A. Metal curb flashings:
 - 1. Raise curb. Clean flange.
 - 2. Replace rotted blocking, if necessary.
 - 3. Mechanically attach wood blocking to existing blocking, if present.
 - a. Width: Same as existing.
 - b. Blocking thickness: Equal to final insulation thickness.
 - c. Vertical height: 8" min. above roof field.
 - 4. Fasteners shall be installed in two (2) rows staggered. Spacing in any one (1) row shall not exceed twenty-four (24) inches.
 - 5. Offset blocking layers twelve (12) inches; weave corners.
- B. Pitch pan/flashing collar locations:
 - 1. Attach wood blocking to structural deck at all pitch pan locations; adhesive required.
 - a. Blocking thickness: Equal to final insulation thickness.
 - b. Width: Four (4) inches, nominal.
 - 2. Offset blocking layers twelve (12) inches; weave corners.
- C. Wood blocking and roof edge metal flange fastening pattern:

Х	Х	X	6"X	Х	Х	Х	Х	Х	Х	Х
Х	Х	Х	X6"X	(Х	Х	Х	Х	Х	х

3.05 ROOF DECK REPAIRS

A. Wood Deck Repair:

- 1. Remove deteriorated deck areas until sound base is reached.
- B. Replace all deteriorated wood deck planking secured to structural framing 6" o.c. with 8d nails sufficient to penetrate the wood structural supports.
- C. Install one (1) panel clip per side to insure 1/8" spacing between adjacent panels.

D. Metal Roof Deck Repairs:

- 1. Deck Reinforcement: Install sheet steel reinforcement profiled to existing decking configuration over all rusted openings 16" or less. If two (2) or more rusted openings exist in same panel, replace panel.
- 2. Deck protection: Apply rust inhibiting paint over surface rust after cleaning loose surface rust from deck panel.

E. Metal Deck Replacement:

- 1. Replace with 22 gage metal roof panel of the same style and profile as existing panels. Minimum length: <u>Three (3) span</u> panels.
- 2. Erect metal roof panel according to SDI Design Manual. If unable to lap, butt to adjacent deck with rib configuration cut-outs, creating an overlap to existing panel. Minimum bearing on steel supports: 1".
- 3. Mechanically fasten side laps 18" o.c. maximum.

3.06 INSTALLATION – EAVE/VALLEY ICE DAM PROTECTION

- A. Place eave edge and gable edge metal flashing tight with fascia boards. Weather-lap joints 2 inches. Secure flange with nails spaced 8 inches on center.
- B. Apply Ice Dam Waterproofing Shingle Underlayment as eave protection fully adhered to wood sheathing, avoiding any wrinkles. If wrinkles develop, cut wrinkle and lay flat and install a piece of the Ice Dam membrane over the cut in the membrane.
- C. Extend eave protection membrane minimum 72" inches above drip edge and roughly 18" on each side of corresponding valley.

3.07 THERMAL INSULATION

- A. Install base layer 1.5" polyisocyanurate insulation board with FM 1-90 (minimum16 fasteners per 4x8) fastening pattern. Fully adhere 1/4" tapered insulation with 2 part low rise foam in a 1-90 bead pattern.
 - 1. Firmly butt each insulation board to surrounding boards.
 - 2. Eliminate open joints and uneven surfaces.
- B. Maximum insulation gap: 1/8 inch.
- C. Fill insulation board joint gaps larger than 1/4 inch with roof insulation.
- D. Maximum elevation variation between boards at joints: 1/8 inch.
- E. Cut and fit insulation boards where roof deck intersects vertical surfaces. Cut board 1/4 inch from vertical surface.
- F. Stagger joints at least six (6) inches.
- G. Filler size: Eighteen (18) inches in length or width, minimum.
- H. All insulation boards will be weighed down with appropriate weight loads on all 4 corners during the installation of insulation boards. Weights to remain until foam has cured.
- I. Remove all low rise foam clots from between insulation boards. This includes the surface of the board.

3.08 COVER BOARD INSTALLATION

A. Attachment of Cover Board:

- 1. Apply the dual component polyurethane adhesive at the manufacturer's written instructions for installing the specified cover board to the specified polyisocyanurate insulation.
- 2. The dual component polyurethane adhesive shall be dispensed in 12 inches on center bands in the field of the roof. In the corners and perimeters of the roof area, the number of ribbons per unit width or area over the field rate by:
 - a. 70% in the perimeter resulting in a maximum on center spacing equal to 60% of the field spacing (field ribbons at 12" on center, the perimeter spacing shall be 7" on center).
 - b. 160% in the corner resulting in a maximum on center spacing equal to 40% of the field spacing (field ribbons at 12" on center, the corner spacing shall be 4.8" on center.).
- 3. After allowing low rise urethane foam to rise ³/₄ inch to 1 inch, lay cover board in to position and walk into place. After walking into place, the cover board shall be pressed firmly into the adhesive layer with using an approved weighted roller by frequent rolling in two or more directions.
- 4. The cover board shall be completely adhered to the top layer of the specified insulation board. There shall not be any elevation change or raise of the corners or sides of the cover board as compared to the sides of the adjacent cover board sides. The cover board shall lay flat or level as compared to the edges of the adjacent cover board.
- 5. Using a blower or a broom, clean the cover board thoroughly prior to applying membrane adhesive. No debris is allowed under roofing membrane.
- 6. After installation of the cover board, the cover board shall lay level to the adjacent sides of the cover board. Should the cover board have more than 1/8 inch deviation or rise to the adjacent cover board, the Installer will held responsible for replacing the unacceptably installed cover board. All cost related, i.e. replacement of specified insulation, cover board, membrane, etc., to the replacement of the unacceptably installed cover board will be at no cost to the Owner. The replacement of the unacceptable cover boards shall be completed prior to the installation of the membrane.

3.09 CRICKETS

- A. Install pre-manufactured crickets between drains, at end walls, and on up-slope of projections to provide positive slope to drain.
 - 1. Adhere crickets to substrate with low rise foam adhesive with 1-90 bead pattern.
 - 2. Slope: 1/2" Minimum.

3.10 ROOF SYSTEM APPLICATION(Shingles)

- A. Install one (1) ply synthetic underlayment over deck, shingle fashion. Overlap each sheet six (6) inches, lap ends four (4) inches minimum with plastic cap nails (staples not acceptable).
- B. Install Owner approved fiberglass self-sealing asphalt shingles roof system in accordance with accepted manufacturer's instructions, UL & ASTM Class A wind resistance standards and fire rating. Replacement area shall be roofed with shingles at the end of each workday, without exception.
 - 1. Six (6) nails per shingle tab
 - 2. Apply 1" diameter spots of asphalt roofing cement under each tab corner.(Two Total)
 - 3. All nails shall be driven straight and laying flush with the top surface of the shingle tab.
 - 4. Do not underdrive or overdrive nails. Overdriven shingles must be removed/replaced and renailed properly
 - 5. Nails shall be in a straight line across the shingle tab.

6. Chalk lines will be expected every 36" to verify straight application lines.

- B. Shingle application:
 - 1. 1ST COURSE: Apply a full Highland Slate shingle at the lower left corner of the roof, flush with the starter course left corner. Fasten with 6 nails.
 - 2. 2ND COURSE: Cut 4 1/2" off the left end of a full shingle and apply remaining 31 1/2" piece over left edge of 1st course. Fasten with 6 nails and ensure 8" exposure.
 - 3. SUCCEEDING COURSES: Begin application of the 3rd course with a full shingle. Fasten with 5nails, leaving the right end unfastened until later.
 - Begin the 4th course using a shingle with 4 1/2" cut off its left end. Fasten with 5 nails. To begin the application of subsequent courses, alternate full shingles [36"] and cut shingles [31 1/2"] up the rake edge, fastening as described.
 - 5. REMAINING COLUMNS AND COURSE COMPLETION: Apply a full shingle against the right edge of each shingle in previous column. When applying a shingle against a covered shingle, carefully lift the right edge of the shingle above and slip the new shingle under it. Fasten as usual with 6 fasteners; then, fasten the loose right edge of the shingle above.

3.11 FLASHINGS (Shingle Roof)

- A. Metal fascia as required:
 - 1. Remove and replace all gutters, downspouts and or control heads and replace with new.
 - 2. Remove existing edge flashing and replace.
 - 3. Replace rotted blocking, as required.
 - 4. Install roofing synthetic underlayment onto wood with plastic cap nails.
 - 5. Fabricate and install 26 ga. Kynar coated sheet steel drip edge.
 - a. Fascia/rake edge width: 2" 3" sufficient to extend onto roof deck surface minimum 2-1/2".
- B. At plumbing vents:
 - 1. Remove existing stack flashing.
 - 2. Ensure that existing vent stack is no less than 12" above roof. Install extension lengths, as necessary to provide 12" or code approved height.
 - 3. Fabricate and install plumbing vent flashing from lead. Flange: Four (4) inches wide minimum; extend completely around periphery of vent flashing. Set flange into mastic. Neatly dress flange with wood block.
 - a. Pipe outside diameter greater than two (2) inches: Bend lead inside pipe one (1) inch minimum with pliers or rubber/plastic mallet; replace cracked lead.
 - b. Pipe outside diameter two (2) inches or less: Cut lead at vent top; fabricate and install integral lead cap.
 - 4. Pipe stack height: 12" min. above roof field membrane.
 - 5. Seal flange with asphalt mastic.
 - 6. Install shingles around lead flashing.

3.12 PVC ROOF SYSTEM APPLICATION

- A. Starting at the low point of the roof, place the membrane panels without stretching over the acceptable substrate. Position subsequent membrane sheets in the same manner, overlapping the ends of adjoining sheets a minimum of 3" and side laps a minimum of 6". Install panels to ensure that laps shed water.
 - 1. Where PVC Membrane has been cut to expose reinforcing membrane, PVC Cut Edge Sealant or PVC General Purpose Sealant must be used to encapsulate exposed edge.

3.13 MEMBRANE LAP SPLICING

- A. Lap splice areas that have been contaminated must be wiped down with a dry or damp (manufacturer's membrane cleaner only) clean cloth prior to heat welding and allow to completely dry.
- B. All field and flashing splices on the horizontal surface shall be completed using an automatic heat welder that has been designed for hot air welding of thermoplastic membranes.
- C. Hand held welders are only to be used on vertical welds or where an automatic welder is not practical or cannot be used.
- D. Seams made with the automatic welder shall be a minimum of 1-1/2" wide. Seams made with hand welders shall be a minimum of 2" wide. Use 2" side silicone or silicone coated steel hand rollers to assure proper mating of surfaces as hand heat welding proceeds.
- E. Probe all completed welds using a flat screwdriver or cotter pin puller type tool to verify seam integrity. Do not probe welds until they have had time to cool to ambient conditions. Any welds found to be insufficiently welded need to be repaired on a daily basis.

3.14 MEMBRANE SECUREMENT

- A. Secure membrane at all locations where the membrane terminates or goes through an angle change greater than 1" in 12" except for round pipe penetrations less than 18" in diameter and square penetrations less than 4" square.
 - 1. Mechanically fasten Seam Plates with Fasteners in accordance with RMT Details.
 - 2. Install PVC membrane as flashing.

3.15 FLASHING - PENETRATIONS

- A. General:
 - 1. Remove all existing flashings (i.e., lead, asphalt, mastic, etc.)
 - 2. Flash all penetrations passing through the membrane.
 - 3. The flashing seal must be made directly to the penetration.
- B. Pipes, Round Supports, etc.
 - 1. Flash with PVC Pipe Flashings where practical
 - 2. Flash using PVC unsupported Flashing membrane when Pre-Molded Flashing is not practical.
- C. Structural Steel Tubing
 - 1. Use a field fabricated pipe-flashing detail provided that the minimum corner radius is greater than1/4" and the longest side of the tube does not exceed 12". When the tube exceeds 12: use a standard curb detail.
- D. Roof Scuppers
 - 1. Mark a 48" area on the deck.
 - 2. Install tapered edge strip around drain to create 48" inch sump. Miter corners. Adjust edge strip thickness so that final tapered edge strip thickness at existing roofing is even with roofing surface.
 - 3. Hand weld PVC field membrane to PVC coated metal scupper.
 - 4. Caulk all PVC membrane inside of scupper.
 - 5. Installation of 4-6" P&S membrane on corners of scupper or as needed.

- E. Pipe Clusters and Unusual Shaped Penetrations
 - 1. Fabricate penetration pockets to allow a minimum clearance of 1" between the penetration and all sides.
 - 2. Secure penetration pockets per Details.
 - 3. Fill penetration pockets with 2 part Pourable Sealer, so as to shed water.
- F. Hot Pipes
 - 1. Protect the PVC components from direct contact with steam or heat sources when the in-service temperature is in excess of 140°F. In all such cases flash to an intermediate insulated "cool" sleeve per details.
- G. Flexible Penetrations
 - 1. Provide a weather tight gooseneck set in Water Block Seal and secured to the deck.
 - 2. Flash in accordance with Details.

3.16 FLASHING PARAPETS, MECHANICAL EQUIPMENT CURBS, SKYLIGHTS, ETC.

A. General:

Using the longest pieces practical, flash all walls, parapets, curbs, etc., a minimum of 8" high per Details.

- B. Evaluate Substrate:
 Evaluate the substrate and overlay per specifications as necessary.
- C. Remove all existing flashings.
- D. Remove foreign material to provide a smooth, sound surface for new flashings.
- E. Apply PVC Bonding Adhesive at about the same time to both the membrane flashing and the surface to which it is being bonded so as to allow approximately the same drying time. Apply Bonding Adhesive by rolling the adhesive on to the mating surfaces evenly, avoiding globs or puddles.
- F. Allow PVC Bonding Adhesive to flash off until tacky. Touch the Bonding Adhesive surface with a clean, dry finger to be certain that the adhesive does not stick or string. As you are touching the adhesive, pushing straight down to check for stringing, also push forward on the adhesive at an angle to ensure that the adhesive is ready throughout its thickness. If either motion exposes wet or stringy adhesive when the finger is lifted, then it is not ready for mating. Flash off time will vary depending on ambient air conditions.
- G. Roll the flashing into the adhesive evenly and carefully so as to minimize wrinkles.
- H. To ensure proper contact, compress the flashing to the substrate with a stiff push broom or roller.
- I. Complete the splice between membrane flashing and the main roof sheet by hot air welding. Provide lap splices in accordance with Details.
- J. Provide termination directly to the vertical substrate as shown in Details.
- K. Install PVC T-Joint covers at field and flashing splice intersections as required by Manufacturer.
- L. Install intermediate flashing attachment as required by Specifications and Details.

3.17 WALKWAY INSTALLATION

A. Provide walkways composed of Manufacturer's system recommended material around all HVAC units and equipment requiring scheduled maintenance, ladder accesses and scuttle access hatch.

3.18 ADJUSTING AND CLEANING

- A. Repair of deficiencies:
 - 1. Installations of details noted as deficient during Final inspection must be repaired and corrected by applicator, and made ready for re-inspection, within five (5) working days.

B. Clean-up:

- 1. Immediately upon job completion, roof membrane and flashing surfaces shall be cleaned of all debris.
- 2. Clean adjacent buildings of current roofing related debris.
- 3. Remove roofing and roofer related debris from Clayton School District property work site.

END OF SPECIFICATIONS









EXISTING METAL DECK AND NAILBASE TO REMAIN IN PLACE SYNTHETIC BASE PLY MEMBRANE NEW DIMENSIONAL SHINGLES 24 GA. KYNAR COATED FASCIA METAL 22 GA. CONTINUOUS CLEAT	KED BY:
	FING AND OOFING ANTS, INC. COURT #18 0 63011 DRAWN BY: KFO CHEC
	ATT RMT ROOF WATERPR WATERPR CONSULT 410 SOVEREIGN (MANCHESTER, M (636)-391-2185 (636)-391-2185
	ADMINISTRATION BUILDING ROOF REPLACEMENT SCHOOL DISTRICT OF CLAYTON, MISSOUR ROOF DETAIL
	PROJECT NUMBER
	SHEET A102 of 7





