

Invitation to Bid

OWNER: Woodhaven-Brownstown School District

ROOF PROJECTS: Yake Elementary School

CONSULTANT: The Avrie Group, Inc.
David M. Chwalibog, President
248-676-2300
248-676-2311
dave@avriegrup.com
www.avriegrup.com

WOODHAVEN-BROWNSTOWN SCHOOL DISTRICT

Bid Proposal Partial Roof Replacement Yake Elementary School

Woodhaven-Brownstown School District is accepting sealed bids for Partial Re-Roofing of Yake Elementary School.

A **mandatory** pre-bid meeting shall be held on **March 25, 2011 at 1:00 p.m., EST.**, at Yake Elementary School, located at 16400 Carter Road, Woodhaven, MI 48183. The bid packet will be available at the pre-bid meeting only.

Two (2) copies of the sealed bid along with one (1) original should be submitted to Lani Rozga, Executive Director, Business Services, Woodhaven-Brownstown School District, located at 24821 Hall Rd., Woodhaven, MI 48183 by **3:00 pm, April 5, 2011**. The bids will be publicly opened at this time and the proposals must contain the wording "**YAKE ELEMENTARY ROOF PROJECT 2011**" on the envelope/package.

In compliance with Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, the Americans with Disability Act of 1990, and the Elliott-Larsen Civil Rights Act of 1977, it is the policy of the Woodhaven-Brownstown School District that no person shall on the basis of race, color, religion, national origin or ancestry, gender, age, disability, height, weight, or marital status be excluded from participation in, be denied the benefits of, or be subjected to discrimination during any program, activity, service or in employment. For information, contact the:

Office of the Superintendent

INSTRUCTIONS TO BIDDERS

1. FORM OF PROPOSAL

- A. The proposal, **in triplicate**, shall be submitted on the form provided herein with all items of the form properly filled out.
- B. Any questions regarding this project, technical or not, **shall be submitted in writing (request for interpretation form)**, C/O David M. Chwalibog, The Avrie Group, Inc., 248-866-8430 or dave@avriegrup.com, **no later than 72 hours prior to bid opening**. All questions will be answered in writing with a copy to **all** bidders.

2. BID BOND

- A. A **bid bond** in the amount of **5%** of the bid made to Woodhaven-Brownstown School District shall accompany the proposal. The amount of the bid bond shall be forfeited to the Owner upon failure of the successful bidder to enter a contract within thirty- (30) days after acceptance of the proposal.

3. RIGHT TO REJECT

- A. Woodhaven-Brownstown School District Board of Education reserves the right to reject any and all bids, or to waive irregularities as its interest may require.

4. AWARD OF CONTRACT

- A. Woodhaven-Brownstown School District Board of Education reserves the right to determine which bid is best suited for its use, to accept any or all parts of a bid, and assign all or part of the contract to one of more of the qualified bidders.

5. AWARD DATE

- A. The date of the contract award shall be the date on the Purchase Order issued by Woodhaven-Brownstown School District.

6. WITHDRAWAL OF BID

- A. No bidder may withdraw his bid for a period of **180 days** from the date of opening the bids.

7. CONTRACT

- A. Within ten days after being notified of the acceptance of the proposal, the bidder to whom the award is made will be required to enter into a written agreement in the form hereto specified with the WOODHAVEN-BROWNSTOWN SCHOOL DISTRICT and furnish two bonds with an approved indemnity company, as surety, as follows:
 - 1) **PERFORMANCE BOND:** A Surety Bond in the full amount of the contract, running to Woodhaven-Brownstown School District, demanding faithful performance of all provisions of the Contract and the satisfactory completion of the work within the time stipulated in the contract.
 - 2) **PAYMENT BOND:** A Surety Bond in the amount of **10% of the contract**, running to Woodhaven-Brownstown School District insuring the payment of all bids by the bidder to Subcontractor and for labor and material.

8. REQUIREMENTS FOR SIGNING BIDS

- A. Bids, which are not signed by the individual making them, should have attached thereto a power of attorney evidencing authority to sign the bid in the name of the person for whom it is signed.
- B. Bids, which are signed for a partnership, should be signed by all of the partners or by an attorney in fact. If signed by an attorney in fact, there should be attached to the bid a power of attorney evidencing authority to sign the bid, executed by the partners.
- C. Bids, which are signed for a corporation, should have the correct corporate name thereto and the signature of the president or other authorized officer of the corporation below the corporate name following the work "By".

9. ADDENDUM

- A. The bidder may, during the bidding period, be advised by Addenda of additions or alterations to the Specifications and Drawings. All such changes shall be included in the work and shall become part of the Contract Documents.

10. VOLUNTARY ALTERNATES

- A. Base bids are requested and required in accordance with the detailed specifications.
- B. Voluntary alternates, which, in the bidder's judgment will result in a better job or an equally satisfactory job at a lower cost, are allowed. The Owner reserves the right to reject any and all alternates. A Voluntary Alternate Form must be submitted with any request to deviate from the standard of quality herein.**
- C. Such alternates are to be described in detail, together with any addition or deduction to the base price, to permit proper evaluation (see instructions in General Conditions).

11. EXAMINATION OF SITE

- A. The bidder shall visit the various sites of the work to fully inform him of the existing conditions and materials and labor required to complete the project. No additional compensation will be allowed to complete the work due to the bidder's failure to acquaint him with the existing conditions.

12. START/COMPLETION TIME

- A. The work shall be scheduled to commence on or after July 15, 2011 and must be completed on or before September 1, 2011.**

13. PAYMENT

- A. The contractor shall submit **bi-monthly** invoices for work completed. These will be paid on a regular basis, less an appropriate retention. Final payment will be made upon successful completion of all punch list items and issuance of all warranties.

14. DAYS AND HOURS OF WORK

- A. Work may be done Monday through Saturday from the hours of 6:00 a.m. to 6:00 p.m. If the Contractor wishes to work at other times, he shall submit a request in writing to The Avrie Group, Inc.

15. QUALITY – APPEARANCE - TIMELINESS

- A. Woodhaven-Brownstown School District has high standards for excellence. These include quality, attention to appearance and image, and timely completion of the specified work.
- B. The standards are reflected in the specifications and other documents within this proposal. The Owner will expect the Contractor to meet these standards, which will be enforced by Woodhaven-Brownstown School District personnel and The Avrie Group, Inc.
- C. Some examples of these standards are listed below:
 - Planning ahead so that the work can be completed within the established time limits.
 - Doing the work correctly the first time.
 - Keeping equipment clean, presentable and well maintained.
 - Keeping a flexible schedule and cooperating in a reasonable manner with The Avrie Group, Inc. and Woodhaven-Brownstown School District.
 - Daily cleanup of the work area to keep it in a neat, safe and presentable appearance.
- D. Woodhaven-Brownstown School District elicits the full support and cooperation, of the Contractor to complete the contract work for the price submitted.

16. PREVAILING WAGE

- A. See <http://www.milmi.org/> for 2011 prevailing wage and overtime requirements for this project. **This is a prevailing wage required project.**

CONSTRUCTION BID DISCLOSURE STATEMENT – FAMILIAL RELATIONSHIP

Pursuant to MCL 380.1267, a sworn and notarized statement disclosing any familial relationship that exists between the Owner and any employee of the bidder and any member of the Woodhaven-Brownstown School District Board or the Woodhaven-Brownstown School District Superintendent must be accompanied with the bid. **Bids without this disclosure statement shall not be accepted.**

The Woodhaven-Brownstown School District Superintendent is: Barbara Lott

The Woodhaven-Brownstown School District Board Members can be found at http://www.woodhaven.k12.mi.us/gen_info.htm

The Following are the familial relationships:

There are none.

STATE OF MICHIGAN

COUNTY OF _____)

The undersigned, authorized representative of bidder (insert name) _____

does hereby acknowledge that bidder has read the foregoing disclosure statement and the statements herein contained are true.

Signature of Bidder Representative

Print Name

Title

Subscribed and sworn to before me this ____ day of _____, _____.

Notary Public, _____ County, Michigan
My commission expires: ____/____/_____

Voluntary Alternate Request Form

PROJECT NAME: _____ LOCATION _____

ROOF AREA (S): _____ ROOF SLOPE: _____

MANUFACTURER SUBMITTING: _____ SYSTEM NAME: _____

MEMBRANES: Name each membrane and supply date of original introduction in its current formulation.

MEMBRANE NAME: _____ DATE OF 1st PRODUCTION: _____

a) Field Membrane _____

MEMBRANE NAME: _____ THICKNESS: _____ WEIGHTS: _____

a) Field Membrane _____ MILS _____ lbs. per 100 sq. ft.

MANUFACTURER DECLARATION: YES _____ NO _____ ANY OR ALL MEMBRANE PLIES AS LISTED ABOVE HAVE BEEN OR ARE CURRENTLY PRODUCED BY MANUFACTURER (S) OTHER THAN THE SPECIFIED SUPPLIER (MADE-TO-SPEC. RE-BRANDED, RE-LABELED, ETC.). IF YES, PROVIDE INFORMATION ABOUT THE PRODUCER (S) OF THIS MEMBRANE (S) AS REQUIRED BY SUBMITTAL REQUIREMENTS IN SPECIFICATION.

Include with this submittal form: (testing approvals as required by the job conditions shall be highlighted)

- a) Copy of the UNDERWRITERS LABORATORIES (UL) testing for the proposed roof-system over the designed roof assembly and roof slope conditions. Indicate (by-highlighting on the report) the UL approval rating for the proposed roof system.
- b) Copy of the FACTORY MUTUAL (FM) testing for the proposed system over the designed roof assembly, roof slope and wind conditions. Indicate (by highlighting on the report) the FM approval rating for the proposed roof system.
- c) Original sample, not photocopy, of the manufacturer's Roof Membrane Guarantee to be supplied the Owner upon completion of the proposed roof system installation.
- d) Provide current copy of manufacturer's product catalog product information sheets and installation guide. Indicate (in writing) the manufacturer's product to be considered for substitution alongside each product listed in the specifications.
- e) List of Approved Roofing Applicators within the immediate geographical area, with date of approval.

LIST THREE (3) PROJECTS OF EQUAL SIZE AND DEGREE OF DIFFICULTY IN WHICH THE ABOVE PROPOSED ROOF SYSTEM HAS BEEN PERFORMING SUCCESSFULLY FOR AT LEAST TEN (10) YEARS UNDER SIMILAR CLIMATIC CONDITIONS, WITHIN THE STATE OF MICHIGAN:

	PROJECT #1	PROJECT #2	PROJECT #3
PROJECT NAME	_____	_____	_____
PROJECT ADDRESS	_____	_____	_____
PROJECT LOCATION	_____	_____	_____
PROJECT SIZE	_____	_____	_____
MEMBRANES USED	_____	_____	_____
GUARANTEE DATE	_____	_____	_____
PROJECT OWNER	_____	_____	_____
OWNER REP	_____	_____	_____
OWNER PHONE	_____	_____	_____
SPECIFIER	_____	_____	_____
SPECIFIER PHONE	_____	_____	_____

Indicate, whether or not, membrane and/or supplies for the above projects had been produced by others under a re-labeling agreement, or produced at an outside manufacturing facility under a leasing or regular manufacturing agreement:

YES _____ NO _____

I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT. I AFFIRM THAT I HAVE KNOWLEDGE AND/OR ACCESS TO PERSONS WITHIN THE MANUFACTURING COMPANY (PROPOSING SUBSTITUTION) WITH PRODUCT AND PROJECT KNOWLEDGE IN ORDER TO MAKE THIS SUBMITTAL:

SIGNATURE: _____ Date _____ Phone () _____

PRINT NAME: _____ TITLE _____

(Omissions TO THE PRODUCT, PROJECT AND TESTING INFORMATION AS REQUIRED, can be deemed non-responsive and grounds for product rejection for use on this project. Additional information and/or clarification of enclosed information may be required for further evaluation.)

WOODHAVEN-BROWNSTOWN SCHOOL DISTRICT
BID PROPOSAL FORM

CONTRACTOR NAME: _____

PARTIAL ROOF REPLACEMENT

Yake Elementary School

The Undersigned having examined the Bid Documents, including the Invitation to Bid, General Conditions, Technical Specifications and Plans/Drawings, and being familiar with all conditions, affecting this proposed project, hereby proposes to furnish all labor, material, tools, equipment, utilities, transportation or other facilities and services necessary to perform and complete the construction of the proposed project in accordance with the Bid Documents for the sums and under the conditions as follows:

BASE BID- The undersigned agrees to the performance of the Work as stated for the following Base Bid Sums (the amounts shall be in both words and figures with the amount in figures governing in the event of discrepancy):

Yake Elementary School Roof System Base Bid (all sections):

_____ Dollars (\$ _____).

Alternate #1 (all sections):

_____ Dollars (\$ _____).

Manufacturer of roof system bid: _____

COMMENTS:

UNIT PRICES

1. Deck Repair – Steel: _____ Square Foot
2. Deck Replacement – Steel: _____ Square Foot
3. Wood Replacement:
 - 1" x 6" _____ Lineal Foot
 - 1" x 8" _____ Lineal Foot
 - 1" x 10" _____ Lineal Foot
 - 1" x 12" _____ Lineal Foot
 - 2" x 4" _____ Lineal Foot
 - 2" x 6" _____ Lineal Foot
 - 2" x 8" _____ Lineal Foot
 - 2" x 10" _____ Lineal Foot
 - 2" x 12" _____ Lineal Foot
4. Additional work requested by building owner shall be established on a time and material basis. This rate shall be given as a unit cost:
 - 1) Labor: \$_____/hour
 - 2) Material Cost: _____%
5. Installation of new drains (cast iron components only): _____/each plugged.
6. Flat stock sheet metal (minimum 16 gauge): _____/Square Foot.
7. All unit prices are **installed** price, labor and material included.

MISCELLANEOUS BID INFORMATION

- 1. This proposal includes the requirements as set forth in the addenda issued during the bidding period, if any, as follows:

Addendum Number	Date Issued
_____	_____
_____	_____

- 2. If notified of the acceptance of this proposal within thirty- (30) days of the date of bid, the undersigned agrees to execute a contract for the above work up to one hundred twenty (120) days after date of proposal.

- 3. Please provide estimated number of **work** days to complete project _____

- 4. Bid bond included? _____ Safety Plan included? _____

- 5. Current workers compensation modification rate: _____

- 6. Provide at least three (3) Michigan School references with contact person and phone number:

- 1. _____
- 2. _____
- 3. _____
- 4. _____

- 7. Certified contractor letter included with bid form?

ADDITIONAL WORK

The BASE BID includes all overtime charges, if required, to complete the specified project work.

It is understood that, if additional work is required, the Contractor will provide a detailed cost breakdown for quantities of material and required labor, (hours and rates) to complete the work. This would be applicable for work not covered by UNIT PRICES.

The percentages we will use in computing our lump sum prices for additional work are as follows:

	Percentage
1. Overhead and profit	_____ %
2. Insurance taxes, benefits (labor only)	_____ %
3. Sales/use tax (material)	_____ %
4. Handling fee (subcontractors)	_____ %

Respectfully submitted,

Contractor's Name

Address

If Bidder is an individual, sign here:

Individual

If a Corporation, officers sign here:

President

Secretary

(SEAL)

If a partnership, partner sign here:

GENERAL CONDITIONS

DEFINITIONS

1. The Contract Documents consist of the Bid Form, Appendix A, Invitations to Bid, Instructions to Bidders, the General Conditions of the Contract, the Supplementary Conditions, and Specifications, including all modifications thereof incorporated in the Documents before their execution. **THESE DOCUMENTS FORM THE CONTRACT BETWEEN OWNER AND CONTRACTOR.**
2. The Owner, the Contractor, and AGI (The Avrie Group, Inc.) mentioned as such in the Agreement. They are treated throughout the Contract Documents as if each were of singular number.
 - **Schools shall be referenced as YES for Yake Elementary School.**
 - **The "Owner" is Woodhaven-Brownstown School District or WBSD.**
3. The term Subcontractor, as employed herein, includes only those having a direct contact with the Contractor and it includes one who furnishes material worked to a special design according to plans or Specifications of this work, but does not include one who merely furnishes materials not so worked.
4. The term "work" of the Contractor or Subcontractor includes labor or materials or both.
5. "Best" means the first grade of quality of the material specified.
6. All time limits stated in the Contract Documents are of the essence of the Contract.
7. When the words **approved, satisfactory, equal, proper, as directed**, etc., are used, approval, by the Owner and/or Owner's Representative or Owner's Inspector is understood.
8. **Local code and the law of the place of building shall govern the construction of this Contract.**
9. The term Owner in these Documents shall pertain to the Owner's Representative for this project.

EXECUTION, CORRELATION AND INTENT OF DOCUMENTS

1. The Owner and the Contractor shall sign the Contract Documents in duplicate.
2. The Contract Documents are complimentary and what is called for by any one shall be as binding as if called for by all. The intention of the Documents is to include all labor and materials, equipment, and transportation necessary for the proper execution of the work. Materials or work described in words, which so applied, have a well-known technical or trade meaning shall be held to refer to such recognized standards.

MATERIALS QUALIFICATIONS/SUBSTITUTIONS

1. The specified materials are named to denote the kind and quality required, whether or not the words "or approved as" are used. These materials shall serve as standards and all proposals shall be based upon the same. Any changes during the project shall receive the necessary field or change order.
2. **Request for substitutions will be accepted from Roof Contractor only. Request for substitutions from parties not bidding on the project, as a primary contractor will not be considered.**

3. To substantiate the equality or performance of any alternate under actual field use, and after approval of shop drawings, a bidder offering "approved as" materials shall submit a list of three (3) jobs of similar size with his bid, where the proposed alternate materials have been used, under similar conditions as specified.
4. Written application with explanation of why substitutions should be considered is required.
5. A detailed roof analysis of the roofs being bid shall be provided. Accredited testing laboratory certificate comparing substitute's physical/performance attributes to those specified is required.
6. Only substitutes approved in writing by building owner prior to scheduled bid date will be considered.
7. Building owner reserves right to be final authority on acceptance or rejection of any substitute.

ALTERNATE MATERIAL SUPPLIED INFORMATION

1. Prime bidders requesting substitutions shall obtain the following items from the proposed alternate material supplier and submit them in the submittal envelope five (5) days prior to the bid date:
 - a. Smallest standard package of any adhesive, coating, mastic, sealant, or ply sheet.
 - b. Individual product identification, including supplier's literature and MSDS sheets.

DETAILED DRAWINGS AND INSTRUCTIONS

1. The Owner's Representative shall furnish, with reasonable promptness, additional Instructions by means of Drawings or otherwise, necessary for the proper execution of all work. All such Drawings and Instructions shall be consistent with the Contract Documents, true developments thereof, and reasonably inferable there from. In case of conflict between the construction Contract and any information elsewhere, the Construction Contract shall take precedence and be the Controlling Document.
2. The work shall be executed in conformity therewith and the Contractor shall do no work without proper Drawings and Instructions.
3. Immediately after being awarded the Contract, the Contractor shall prepare an estimated Progress Schedule and submit it for the Owner's approval.

COPIES FURNISHED

1. Unless otherwise provided in the Contract Documents, the Contractor will be required to obtain all copies of Specifications reasonably necessary for the execution of the work.

DRAWINGS AND SPECIFICATIONS OF THE WORK

1. The Contractor shall keep one copy of all Drawings and Specifications of the work, in good order, available to the Owner and to his Representative.

SAMPLES

1. The Contractor shall furnish for approval, with reasonable promptness, all samples as directed by the Owner. The Owner shall check and approve such samples, with reasonable promptness, only for conformance with the design concept of the project and for compliance with the information given in the Contract Documents. The work shall be in accordance with approval samples.

PROTECTION OF WORK AND PROPERTY

1. The Contractor shall continuously maintain adequate protection of all his work from damage and shall protect the Owner's property from injury or loss arising in connection with his contact. He shall make good any damage, injury or loss, except such as may be directed due to errors in the Contract Documents or caused by agents or employees of the Owner, or due to causes beyond the Contractor's control and not to his fault or negligence. He shall adequately protect adjacent property as provided by law and the Contract Documents.
2. *The Contractor shall take all necessary precautions for the safety of the employees on the work site and shall comply with all applicable provisions of Federal, State, and Municipal safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to, the premises where the work is being performed.* He shall erect and properly maintain at all times, as required by the conditions and progress of the work, all necessary safeguards for the protection of workmen and the public and shall post danger signs warning against the hazards created by such features of construction, but not limited to, as protruding nails, hoists, well holes, elevator hatchways, scaffolding, window openings, stairways, and falling material, and he shall designate a responsible member of his organization on the work, whose duty shall be the prevention of accidents. The Contractor shall report the name and position of any person so designated to the Owner.
3. **The interior of the building shall be protected from the elements, particularly water, at all times. An emergency telephone number will be provided to the Owner in case of leakage problem. When contacted, the Contractor will respond with assistance WITHIN 1 HOUR. Shop floors and equipment shall be protected during construction, as not to damage due to water, debris, and traffic. All open ceiling areas shall have interior contents protected with tarpaulin.**
4. The Contractor shall provide a radio equipped safety person inside the building when the existing roof is removed, insulation is installed and when structural deck is replaced and/or repaired. The safety person shall be dressed in neat and clean street clothes. Work clothes and shoes shall not be worn in the building.
5. The Contractor will determine where interior items subjected to falling debris or adhesives shall be covered. If, in the opinion of the Owner, the Contractor does not prove the required level of protection, the Owner shall do so and deduct the cost of providing the additional protection from the contract. Regardless of the extent of protection, the Contractor will restore any construction damage to the building interior or furnishings to the satisfaction of the Building Owner. Payment will be withheld until corrections are completed.
6. The Contractor will take all reasonable precautions to protect the work from the ravages of the elements. All material stored at the site shall be set up off the ground or roof deck on adequate blocking and covered with tarpaulins. All installed insulation will be covered by a completed membrane prior to leaving the project daily.

7. Roof tractor and trailer, insulation, rolls of membrane and various loads shall be kept at minimum weight so that existing and new insulation is not crushed.
8. No ladders, material or equipment will provide access to the roof after work hours. Do not store insulation pallets or other material directly against the building, which will provide access to the roof area.

SUPERINTENDENT, SUPERVISOR

1. The Contractor shall keep a competent superintendent and any necessary assistants, all satisfactory to the Owner, on his work during its progress. The superintendent shall not be changed except with the consent of the Owner, unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employ. The superintendent shall represent the Contractor in his absence and all directions given to him shall be binding as if given to the Contractor. Important directions shall be confirmed in writing to the Contractor. Other directions shall be so confirmed in writing in each case.
2. The Contractor shall give efficient supervision to the work, using his best skill and attention. He shall carefully study and compare all Drawings, Specifications and other Instructions and shall at once report to AGI. Any error, inconsistency or omission, which he may discover, but he shall be liable to the Owner for any damage resulting from errors or deficiencies in the Contract Documents.

CHANGE IN WORK

1. The Owner, without invalidating the Contract, may order extra work or make changes by altering, adding to or deducting from the work, the Contract Sum being adjusted accordingly. All such work shall be executed under the conditions of the original Contract except that any claim for extension of time caused thereby shall be adjusted at the time of ordering such change.
2. In giving Instruction, The Avrie Group, Inc. shall have authority to make minor changes in the work, not involving extra cost, and not inconsistent with the purpose of the building, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless pursuant of a written order from the Owner.
3. The value of any such extra work or change shall be determined in one or more of the following ways:
 - a. By estimate and acceptance in a lump sum.
 - b. By unit price named in the Contract or subsequently agreed upon.
 - c. By cost and percentage or by cost and a fixed fee.
4. Such extra work shall be presented to Owner's representative, at which time, a formal change order form will be presented to Owner for approval. Copies will be provided to all parties.

CLAIMS FOR EXTRA COST

1. If the Contractor claims that any Instructions by Drawings or otherwise involve extra cost under this Contract, he shall give the Owner written notice thereof within a reasonable time after the receipt of such Instruction, and in any event before proceeding to execute the work, except in an emergency endangering life or property, and the procedures shall then be as provided for change in the work. No such claim shall be valid unless so made.
2. All extras shall be executed by way of a "Change Order" written by the Owner's Representative with all parties executing the Documents.

DELAYS AND EXTENSION OF TIME

1. If the Contractor is delayed at any time in the progress of the work by an employee of either, or by any separate Contractor employed by the Owner, or by changes ordered in the work, or by strikes, lockouts, fire, unusual delay in transpiration, unavoidable casualties, or any cause beyond the Contractor's control, or by delay authorized by the Owner pending arbitration, or by any cause which the Owner shall decide to justify the delay, then the time of completion shall be extended for such reasonable time as the Owner may decide.
2. No such extension shall be made for delay occurring more than seven days before claim therefore is made in writing to the Owner. In case of a continuing cause of delay, one claim is necessary.
3. If no schedule or agreement stating the dates upon which Drawings shall be furnished is made, then no claim for delay shall be allowed on account of failure to furnish Drawings until two weeks after demand for such Drawings and not then unless such claim is reasonable.
4. The Contractor agrees not to make and hereby waives any claim for damages and agrees that the sole right and remedy therefore shall be an extension of time.
5. The Contractor agrees to complete work and execute punch list items in no **greater** than 14 days after the project is deemed completed by the Owner's representative.

CORRECTION OF WORK BEFORE FINAL PAYMENT

1. The Contractor shall promptly replace and re-evaluate his own work in accordance with the Contract and without expense to the Owner and shall bear the expense of making good all work of other Contractors destroyed or damaged by such removal or replacement.

LIENS

1. Neither the final payment nor any part of the retained percentage shall become due until the Contractor, if required, shall deliver to the Owner a complete release of all liens arising out of this Contract, or receipts paid in full in lieu thereof and, if required in either case, an affidavit that so far as he has knowledge of information, the releases and receipts include all labor and materials for which a lien could be filled; but the Contractor may, if the Subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner, to indemnify him against any lien. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

MUTUAL RESPONSIBILITY OF CONTRACTOR

1. Should the Contractor cause damage to any separate Contractor on the work site, the Contractor agrees, upon due notice to settle with such Contractor by agreement or arbitration, if he will so settle. If such separate Contractor sues the Owner on account of any damage alleged to have sustained, the Owner shall notify the Contractor, who shall defend such proceedings at the Contractor's expense and, if any judgment against the Owner arises there from, the Contractor shall pay all costs incurred by the Owner.
2. To insure the proper execution of his subsequent work, the Contractor shall measure work already in place and shall report at once to the Owner any discrepancy between the executed work and the drawings.

USE OF PREMISES

1. The Contractor shall confine his apparatus; the storage of materials and the operations of his workmen to limits indicated by law, ordinances, permits or directions of the Owner and shall not unreasonably encumber the premises with his materials.
2. The Contractor shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.
3. A designated area will be used for transition from staging and parking to rooftop operations.
4. Portable restrooms shall be provided by the Contractor and located only at areas designated by Owner.
5. Electric power and water will be supplied by WOODHAVEN-BROWNSTOWN SCHOOL DISTRICT.

CUTTING / PATCHING

1. The Contractor shall do all cutting, fitting or patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by work of other Contractors shown upon, or reasonably implied by the Drawings and Specifications for the completed structure, and he shall make good after them as the Owner may direct. Any cost caused by defective or ill-timed work shall be borne by the party responsible therefore.
2. The Contractor shall not endanger any work by cutting, excavating, or otherwise altering the work and shall not cut or alter the work of any other Contractor without the consent of the Owner.

CLEAN UP DURING CONTRACT AND AT COMPLETION

1. The Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by his employees or work, and at the completion of the work, he shall remove all his tools, scaffolding, and surplus materials and shall leave his work "broom clean" or its equivalent, unless more exactly specified. In case of dispute, the Owner may remove the rubbish and charge the cost to the several Contractors, as the Owner shall determine to be just. Immediately upon completion, all clean up shall be performed to the satisfaction of the Owner's Representative and the Owner.
2. The Contractor is responsible for the legal removal and disposal of all rubbish and assumes unequivocally all responsibility for all materials once removed from the Owner's property. The Contractor shall deliver to the Owner, or the Owner's Representative upon completion of the project, an affidavit of consent to dump or a waste manifest for all materials disposed of.

MATERIALS AND WORKMANSHIP

1. All materials, fixtures, fittings, appliances, and apparatus shall be of the latest patterns of standard manufacturer, the best of the various kinds specified, and free from all defects, which would injure the efficiency, durability, or appearance, and will be subject to and shall receive the approval of the Owner before being used. All materials shall be brought to the job in their original containers and unopened. No scrimping of materials will be allowed.
2. Where the term "or approved as" is used in these Specifications or on the Drawings, with reference to the manufacturer, grade or quality of materials, it is meant, "approved as" in the opinion of the Owner.
3. **No roofing material used to complete this project shall contain asbestos.**

LOCAL RULES

1. The Owner has certain rules and the Contractor and his personnel shall abide by them. The Contractor shall contact the Owner's Representative for specific information regarding the rules governing all operations for this project.

CONCURRENT OPERATIONS

1. **Because other activities of the Owner will be proceeding at the same time as the work covered by this Specification, the Contractor shall cooperate with the Owner's Representative to ensure that all Contract work progresses in a manner which does not conflict with other activities.**

WORKMANSHIP

1. All workmen shall be thoroughly experienced in the particular class of work in which they are employed. All materials shall be securely fastened in place in a watertight, neat, and workmanlike manner every working day.

SAFETY

1. The Contractor shall comply with all MIOSHA standards.
2. The Contractor shall comply with all applicable provisions of the Occupational Safety and Health Act throughout the duration of the specified project. Including, but not limited to, the use of guard rails/warning line, safety monitor, and personal fall protection.
3. A safety officer shall be assigned by mutual agreement of the Owner and Contractor and shall be responsible to maintain all safety procedures.
4. Submit with bid your companies' safety program (if not already on file with The Avrie Group, Inc.).
5. A semi permanent, ten (10) foot fence, gated and locked, shall contain all hot, flammable, and hazardous material at all times. All concrete or asphalt is to be covered with EPDM where designated by AGI.
6. **The Contractor shall have safety personnel on the interior of the building at all times during the duration of the project.**

INSPECTIONS

1. The Owner shall require the material manufacturer to provide an examination of the work in progress as required for a Warranty.
2. The Manufacturer's Representative shall be responsible for:
 - a. Rendering any inspection services the Owner or The Avrie Group, Inc. may request.
 - b. The Avrie Group, Inc. shall be informed after periodic inspections as to the progress and the quality of the work as observed, but shall have no authority to approve or authorize any change order or extra cost during the project.
 - c. Calling to the attention of the Contractor, those matters observed which he considers to be in violation of the Contract requirements.

- d. Reporting to The Avrie Group, Inc. in writing any failure or refusal of the Contractor to correct unacceptable practices called to his attention.
- e. Supervise the taking of test cuts and the restoration of such areas if required.
- f. Confirming, after completion of the work and based on his observations and tests, that he has not observed application procedures in conflict with Specifications other than those that may have been previously reported. Final payment will not be released until the Owner has received this confirmation.
- g. The presence and activities of the Materials Manufacturer's Field Representative shall in no way relieve the Contractor of his contractual responsibilities. In the event of a dispute, The Avrie Group, Inc. shall have final authority.

NON-COMPLIANCE

1. Non-compliance with the terms of this Specification and ensuing Contract can result in either the cancellation of the Contract or complete replacement of the defective areas at the Contractor's expense.
2. Responsibility For Measurements and Quantities: **The bidding Contractors shall be solely responsible for the accuracy of all the measurements and for estimating the material quantities required to satisfy these Specifications.**

WAIVER OF LIEN

1. Waiver of lien for major materials suppliers shall accompany each payment request after the first payment request to conform and acknowledge disbursement of the payments. Waivers of lien shall be properly completed and shall list the cumulative amounts of payments received by the date of the waiver. All bills will be itemized. **No additional payments will be issued without the properly completed waivers of lien. There will be no exceptions.**

WARRANTY (Conventional roof system)

1. **The Contractor, after all work has been completed and inspected, shall give the building owner a five (5) year labor and material warranty. The manufacturer shall issue a twenty (20) year no-dollar-limit warranty covering labor and materials. These shall be non-prorated warranties and cover the entire waterproofing membrane and all associated new metal installed.**

CONSTRUCTION MATERIALS

1. Materials shall be of the type, size, and quantity specified and in perfect condition when installed. It shall be protected from all injury until final acceptance of the projects. All materials shall be compatible to each other and shall be supplied or accepted by the manufacturer, as mentioned in the Specifications.

TRASH REMOVAL

1. The Contractor shall remove all debris from the roof area to an appropriate dumpster, and it shall be delivered to an approved landfill and legally dispose of. All dumpster needs shall be handled by the roofing Contractor. Under no circumstances shall any construction debris be placed in the owner's dumpsters or left on site.
2. **A debris chute or crane with dump box and proper roof protection shall be used at all times. A tarpaulin shall be secured to side of building and at ladder access points to protect existing walls, windows, and metal.**
3. A Waste manifest shall be delivered to AGI upon Contractor receipt.

PAYMENT

1. **Upon delivery of all materials, verification and start of work, the Owner will accept full billing for materials supplied by Contractor.**
2. Pay applications, on Form AIA Document G702 or like, shall be submitted bi-monthly to the AGI and Owner's representative for approval and processing. **Please include purchase order number on all invoices.**
3. Final payment shall be withheld until all provisions of the Specification and General Conditions are met, including all necessary clean up, and the Owner receives written verification of completion and receipt of all warranties. Final payment will be 10% of the Contract amount.
4. Any request for extra work should be submitted in writing and numbered sequentially with supporting invoices included.

HEALTH AND SAFETY

1. Contractors shall comply with the provisions of the Occupational Safety and Health Administration, Federal Act of 91-596 of 12/29/70 and all DER and EPA regulations and with any other safety and health regulation for the area in which the work is performed (See General Conditions "Safety").

HAZARDOUS MATERIALS

1. If any hazardous materials will be used by the contractor in this contract, it is the contractor's responsibility to furnish Material Safety Data Sheets prior to start of project (submittal package).

* * * END OF SECTION * * *

SUPPLEMENTARY CONDITIONS

1. The "Supplementary Conditions of Contract" are not intended to minimize or alter the General Conditions, but rather to augment its requirements.

The General Conditions and these Supplementary Conditions shall apply to the project as a whole and shall have the same force and effect upon, and to be equally applicable to, each Contractor with whom the Owner shall have entered into a Contract to perform a part or parts of the work.

These aforesaid General Conditions and Supplementary Conditions shall likewise bind any Subcontractor employed in the work.

2. **Contracts in the Work:** The work will be executed under a single inclusive Contract to cover and include all work required and called for in the Specifications and Drawings.
3. **The Agreement:** The Agreement will be executed upon a standard Form of Agreement between Owner and Contractor, incorporating therein the General Conditions of the Contract.
4. **Time of Completion:** Submittals to be done under this Contract shall be started within ten (10) days after award of Contract. The project will be fully and finally completed prior to, or on the completion date. A pre-job conference will be scheduled after award.
5. Specific start dates will be agreed upon at time of pre-construction meeting.
6. **NON-CONFORMANCE OF SCHEDULE PENALTY: \$500.00/Day**
Shall be in effect where delay in meeting schedule causes owner to incur additional costs not originally anticipated. A schedule will be determined, in agreement, with owner and contractor prior to start. This schedule will be part of the contract documents.
7. **Continuity of Work:** The Contractor shall determine that the work is being performed and progressing in accordance with the Progress Schedule agreed upon and shall promptly notify the Owner of any real or anticipated hindrance or delay in the progress of the work by any cause.
8. Weekly meetings will be held with the Contractor, Owner, and AGI.
9. **Permits: The Contractor shall furnish and pay all permits, and licenses required for proper execution and completion of the work of his Contract. The Contractor shall pay all local, state, or federal taxes that are applicable.**
10. **Temporary Utilities:** The Owner shall provide and pay for all temporary electrical power and water required in the work. Any extension required beyond existing facilities will be at the Contractor's own cost. Contractor's storage shall be confined to those areas designed by the Owner. Access into the site for construction purposes shall be confined to the entrances designated by the Owner.
11. **Standard of Quality:** The various materials and projects mentioned in the Specifications are given to establish a standard of quality and cost, with no intent to limit that product, but rather to set up same as the standard desired or acceptable, and establishing a basis for equality. The Contractor shall use no other materials on this project unless submitted and approved in the manner specified in the General and Supplemental Conditions.

12. Contractor's Insurance's: Contractor's and Subcontractor's Insurance: The Contractor shall not commence work under the Agreement until he has obtained all insurance required under this Article and such insurance has been approved by and submitted to the Owner, nor shall the Contractor allow any Subcontractor to commence work on his Subcontract until the insurance required of the Subcontractor has been obtained and approved by Owner.

The following types of insurance, limits of liability, and policy extensions are required of the successful bidder:

Workers' Compensation and Employer's Liability Insurance

Coverage A – Statutory
 Coverage B - \$300,000 Per Accident

Broad Form Comprehensive General Liability Insurance (including Premises Medical, Elevators, Contractor's Protective)

Liability, Blanket Contractual, Products & Completed Operations (including Broad Form Extensions)

Each Occurrence

Combined single limit for bodily injury and property damage liability.	\$1,000,000
General Aggregate	\$2,000,000
Products & Completed Operation Aggregate	\$2,000,000
Personal Injury & Advertising Injury	\$1,000,000
Fire Legal Liability	\$ 50,000

Sub-contractors Operations, Products – Completed Operations and Contractual Liabilities, plus such excess coverage as may be appropriate for the limits listed:

Comprehensive Business Automobile Liability Insurance (owned, hired, and non-owned automobiles)

Bodily/Injury	\$500,000 each Person \$500,000 each Occurrence
Property Damage	\$500,000 each Occurrence

Furnish owner with Contingent Liability Insurance Policy with coverage and liability limits the same as for Broad Form Comprehensive General Liability Insurance specified above. *

Furnish owner with contingent Property Damage Insurance Policy with coverage and liability limits the same as for Property Damage specified above. Woodhaven-Brownstown School District should be names as being an additional insured on the policy. *

The contractor shall not commence work under the Contract until he has obtained all insurance stated in these specifications and the owner has reviewed all insurance and Certificates of Insurance evidencing compliance with the insurance requirements with dates enforced during time of the contract.

Insurance affords is primary as respects to Woodhaven-Brownstown School District's interest; and, any other insurance maintained by the ISD is to be excess of that required of the vendor, contractor, service provider and will not contribute with that insurance required.

All insurance shall be carried with companies authorized to do business in the State of Michigan. Each Contractor shall furnish proof of coverage in the form of certification issued by the insuring companies before commencement of appointed work.

WOODHAVEN-BROWNSTOWN SCHOOL DISTRICT and The Avrie Group, Inc., shall be identified on the Certificate as "additional named insured" under Commercial General Liability policy and Umbrella Liability policy for the same coverage as indicated on this certificate.

Deductible payable by Contractor and subcontractor(s) is \$5,000.00, if responsible.

Material stored off-site shall not be covered under the Owner's property insurance unless the payment terms specifications assume responsibility for coverage by the Owner's property insurance.

The Contractor shall deliver the required bonds to the Owner not later than three days following the date the Agreement is entered into, or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to the commencement of the work, submit evidence satisfactory to the Owner that such bonds will be furnished.

The Contractor shall carefully observe the following special terms.

- 1) If the Contractor observes any asbestos or other toxic material problem, he shall immediately notify the Owner so corrections can be made. The Contractor shall not proceed until the problem is corrected.
- 2) The Owner anticipates the Contractor's insurer(s) for general liability and worker's compensation insurance will monitor the Contractor's site safety program. The Owner expects to receive a copy of the reports from the Contractor.
- 3) **All overtime necessary to complete the work according to the stated schedule shall be included in base bid.**
- 4) The Owner has contracted The Avrie Group, Inc. to monitor the Contractor's quality of application. The Contractor will timely receive a copy of the Owner's inspection reports. The Contractor agrees to keep the Owner's observation service advised of construction progress so inspections can be conducted as desired.
- 5) The Owner reserves the right to require evidence of payment by the Contractor of any taxes or premiums which are levied by Federal, State, or Local Governments upon labor and materials for the work of this contract.
- 6) The Contractor shall pay the contributions measured by wages of his employees required by the Social Security Act, and/or Public Laws of Michigan, and shall accept exclusive liability for said contributions. The Contractor further shall indemnify and hold harmless the owner and AGI on account of any contributions measured by the wages of aforesaid of the employees of the Contractor assessed against the Owner under the authority of said Act and Public Laws of said State.

13. Fire and Extended Coverage Insurance: The Owner, from the commencement of the work and to the final acceptance thereof, shall maintain or cause to be maintained fire insurance on all insurable work and materials included in the Contract against loss or damage by fire and lightning and those perils covered by an extended coverage endorsement, including vandalism and malicious mischief, in such amounts as shall fully protect the Owner and the Contractor as their respective interest may appear. Such insurance policy or policies shall be non-accessible and shall be for the benefit of the Owner and the Contractor as their respective interests may appear. Upon the request of the Contractor, the Owner shall furnish a memorandum or certificate of insurance policy or policies then in force. The Contractor may effect and maintain such other or additional insurance as he may see fit. Re-building, replacement or repair after any loss covered by insurance shall be properly performed by the Contractor without awaiting the collection of the proceeds of insurance or the determination of the distribution thereof. The occurrence of a loss by fire or other causality covered by insurance shall not relieve the Contractor from the responsibility of completing his portion of the work in accordance with his Contract and the plans and Specifications applicable thereto. This provision, with respect to the Fire Insurance, in no way shall relieve the Contractor of his liability to complete the work of the Contract notwithstanding any damage which may occur to the building or the material upon the site by fire or other causality which may occur before delivery to, and final acceptance by, the Owner.
14. Protection: The Contractor shall provide all protection, etc., which may be required by Federal, State or Municipal laws and shall maintain all lights, signals and protections of all kinds for the full period of his operations. **The Contractor shall protect and preserve the adjoining property, etc.** The Contractor shall protect all private roads and walks, and shall maintain them during the course of the work. He shall repair all damage to it at his own expense.
- A. Water Protection: The Contractor shall at all times protect the building from damage from rainwater or wet cutting. He shall provide all materials, labor and equipment to provide this protection. Tie-in shall be inspected and approved daily by owner and/or representative.
- 1) Interior protection is the contractor's responsibility. Open ceiling areas (gyms, etc.) shall be tarped and equipment covered with the same.
- B. Weather Protection: The Contractor shall at all times protect against weather - rain, wind, storms, frost or heat - so as to maintain the existing building and all work, materials, apparatus and fixtures free from injury or damage.
- C. Dust and/or debris protection: Contractor shall protect interior contents to not allow excessive damage or maintenance due to dust and debris.
- D. Damage: Any "work" damaged by failure to provide protection as required above, shall be removed and replaced with **new work (material and labor) at the Contractor's expense**. Areas covered include, but not limited to:
- 1) **Concrete walkways**
2) **Asphalt parking lots**
3) **Sod and/or landscaping (bushes, flower beds, fences, etc.)**
4) **Underground irrigation, electrical lines, and sewer pipes.**
15. The Contractor shall file a Waiver against Liens with the Owner on a form as prescribed by the Owner's Representative and provided with the Contract Documents.
16. The Contractor shall indemnify and save Owner, its agents and employees harmless against, or and from any loss and expense by reason of the liability imposed by law upon the Owner, its agents and employees, for damages because of personal injury, including death at any time resulting therefrom, sustained by any person or on account of damages to property, including loss of use thereof, arising out of, or in consequence of, or by reason of any occurrence in work performed by the Contractor.

17. In hiring of employees for the performance or work under this Contract or any Subcontractor there under, the Contractor, or any person acting on behalf of the Contractor, shall not by reason of race, creed, or color, discriminate against any citizen of the State who is qualified and available to perform the work to which employment is related.
18. No person shall be employed to do work under this Contract except competent and first-class workmen or mechanic. No workmen shall be regarded as competent and as first-class, within the meaning of this Act, except those who are duly skilled in their respective branches of labor.
19. Safety: Contractors shall abide by all OSHA/MIOSHA Local, State, Federal and Owner's Safety requirements.
 - A. After July 4, 1991, a full time employee shall be in attendance of ground level equipment operations at all times while the project is in operation.
 - B. The Contractor is required to have one person in the facility for the duration of the workday to insure adequate interior protection is provided and disruption to normal building operations is minimized.
 - C. Special parking during these times will be designated by the Owner.
20. **No smoking or alcoholic beverages are permitted on the Owner's property. Owner's utilities are available for use by the Contractor or Subcontractor in reasonable quantities. However, lunchroom and toilet facilities will not be available and provisions shall be made by the Contractor for temporary toilets to be provided for workmen unless modified by site management.**
21. The following local rules shall be adhered to:
 - A. No tank top tee shirts or shorts.
 - B. Company ID tags and or uniforms shall be visible at all times.
 - C. Do not enter the buildings with equipment, tools, carts, etc. at any time.
 - D. Excessive noise, foul language, lude behavior and other negative actions are prohibited.
 - E. Do not remain in or on premise beyond normal business hours (6:00 a.m. - 6:00 p.m. Mon.-Fri.) unless stated otherwise.
 - F. Access roads, Sidewalks, entrances, overhead doors, vestibules, stairways, corridors and halls shall not be obstructed or encumbered unless proper notification is received by The Avrie Group, Incorporated.
 - G. There shall be no tolerance for non-compliance of any of these local rules. Violating the rules constitutes failure to comply with the contract, and the contractor can be removed at owner's discretion.

* * * END OF SECTION * * *

SUMMARY OF WORK

1. PART 1 - GENERAL

1.1. SUMMARY OF WORK

A. Remove existing insulation, roof membrane/ballast and sheet metal on roof areas designated on roof plan. Install new tapered insulation/saddles, board insulation, roof system, flashing and sheet metal as directed in project specifications.

B. Work includes:

*** Any ACM shall be handled per NRCA, EPA and OSHA/MIOSHA requirements.

1. All suspect decking will be reported to The Avrie Group, Inc. and handled as per the unit prices quoted in Contract Documents.
2. Install polyiso board insulation and tapered polyiso insulation with insulation adhesive (manufactured by membrane manufacturer) per specifications and manufacturer requirements.
 - a. Over gym area only, insulation must be adhered to existing structural deck. No fasteners are permitted.
3. Install roof membrane system as specified.
 - a. Install new walk pads on new roof. Install walk pads to transition to all new and existing HVAC equipment.
4. All flashing shall be minimum 8 inches in height. Include the cost to raise curbs in your base bid. All flashing shall **go up and over all curbs and/or penetrations**.
5. All new metal must meet ANSI/SPRI Standard ES-1. See Sheet Metal section.
6. All perimeter metal is to remain in place. Carefully install base flashing and NEW counter flashing under existing metal and over new termination bar. Remove all "interior" roof related metal components and install new metal in accordance with SMACNA requirements. Fill any masonry voids to match existing. **Color and thickness shall match existing and be approved by owner, in writing, prior to installation.**
7. Replace existing drains with cast iron bowls and domes (if not existing). **All drains shall be free flowing then plugged during construction (preventing debris from obstructing drainage)**. Drains that are obstructed will be cleaned and made free flowing at the expense of the roofing contractor.
8. All roof areas will be secured in a watertight condition each day before the contractor vacates the site. **A two (2) hour fire watch is mandatory**.
9. Contractor shall provide and pay for all labor, materials, equipment, tools, construction machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the work as required by the Contract Documents.
10. Contractor shall keep off of new roof systems adjacent to work areas at all times. Any damage to the new roof system shall be repaired at the contractor's expense.
11. **Alternate 1:** Remove existing ballast and membrane and install new Duro-Last, 50 mil, membrane (mechanically attached) over existing insulation. Include cost of 5,000 sq. ft. of new insulation board to match existing (replace damaged insulation board). Include cost of 20 year NDL warranty. All other requirements must be met herein. Include cost of

infrared scan in the base bid/alternate I to be provided by AGI prior to start of project - \$3,150.00.

1.2. INTENT OF THE SPECIFICATIONS

- A. The intent of these specifications is to describe the materials and methods of construction required for the performance of the work. In general, it is intended that the drawings shall delineate the detailed extent of the work. When there is a discrepancy between drawings, referenced specifications, and standards and his specification, this specification shall govern.

1.3. PROTECTION

- A. The Contractor shall use every available precaution to provide for the safety of the owner; visitors to the site, and all connected with the work under the Contract.
- B. All existing facilities both above and below ground shall be protected and maintained free of damage. **Existing facilities shall remain operating during the period of construction** unless otherwise permitted. All access roadways shall remain open to traffic unless otherwise permitted.
- C. Semi-permanent ten (10) foot fence and/or barricades shall be erected to fence off all construction areas from school personnel, civilian traffic and non-authorized person.
- D. Safety Requirements.
 - 1. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
 - 2. Comply with federal, state and local and owner fire and safety requirements.
 - 3. Advise owner whenever work is expected to be hazardous to owner employees and/or operations.
 - 4. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.
 - 5. Maintain proper fire extinguisher within easy access whenever power tools, roofing kettles, and torches are being used.
 - 6. ALL SAFETY REQUIREMENTS OF THE BUILDING OWNER SHALL BE FOLLOWED. NO EXCEPTIONS WILL BE PERMITTED. SAFETY ORIENTATION MEETING REQUIRED PRIOR TO PERFORMING ANY WORK.
 - 7. Contractor shall have safety personnel on the interior of the building at all times during the duration of the project.
- E. Grounds shall be thoroughly inspected for underground cable, sewer, and/or sprinkler systems. Contractor is responsible for all/any damage to these systems and shall repair at their own cost.

1.4. HOUSEKEEPING

- A. Keep materials neat and orderly.
- B. Remove scrap, waste and debris from project area **ON A DAILY BASIS**.
- C. Maintenance of clean conditions while work is in progress and cleanup when work is completed shall be in strict accordance with the "General Conditions" of this contract.

D. Fire protection during construction (meet up to date MIOSHA requirements).

* * * END OF SECTION * * *

REGULATORY REQUIREMENTS

1. PART 1 – GENERAL

1.2. RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other sections in these Specification.

1.3. TAXES

- A. Contractor shall pay all sales, consumer, use and other similar taxes required by law.

1.4. PERMITS AND FEES

- A. The Contractor shall apply for and secure all incidental permits, governmental fees and licenses necessary for proper execution and completion of the Work.

1.5. GOVERNING CODES

- A. Work performed under this specification shall be in compliance with applicable codes, laws, and ordinances of the municipal, state, and federal departments concerned. The Contractor shall provide materials and workmanship required by such regulations whether or not specifically noted herein or shown on the drawings.

1.6. NOTICES

- A. The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the Work. If Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules and regulations, and without providing notice building owner's representative, Contractor shall assume full responsibility and shall bear all costs.

1.7. REGULATORY REQUIREMENTS

- A. Adhered to all state and local building codes (**IBC**) as it relates to this project.

*****Perimeter metal system shall meet or exceed ES-1 requirements per International Building Code 2005.**

- B. Shall comply with Factory Mutual 1-60 approved roof system **standard**.
- C. Shall comply with ASTM E-108 **Class A** approved roof system.

* * * END SECTION * * *

REFERENCES

1. PART 1 - GENERAL

1.1. RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other sections of these Specifications.
- B. REFERENCE STANDARDS
- C. Referenced specifications and standards published by national societies, associations, and institutes shall be considered as part of this specification. In all cases, the referenced specification or standard shall be of the most recent publication date. Abbreviated identifications for the particular organizations involved are as listed below:
 - 1. ASTM American Society for Testing and Materials
 - 2. NRCA National Roofing Contractors Association
 - 3. OSHA Occupational Safety and Health Administration
 - 4. SMACNA Sheet Metal and Air-conditioning Contractors National Association
 - 5. EPA Environmental Protection Agency

* * * END OF SECTION * * *

CHANGE ORDER PROCEDURE

1. PART 1 - GENERAL

1.1. DESCRIPTION

A. Work included:

1. Make such changes in the Work, in the Contract Sum, in the Contract Time of Completion, or any combination thereof, as are described in written Change Orders signed by the Owner and the Project Manager and issued after execution of the Contract, in accordance with the provisions of this Section.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and other sections of these Specifications.
2. Changes in the Work are described further in the General Conditions.

1.2. QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance program such measures as are needed to assure familiarity of the Contractor's staff and employees with these procedures for processing Change Order data.

1.3. SUBMITTALS

- A. Make submittals directly to the Project Manager at his normal place of business.
- B. Submit the number of copies called for under the various items listed in this Section.

1.4. PRODUCT HANDLING

- A. Maintain a "Register of Bulletins and Change Orders" at the job site or with superintendent, accurately reflecting current status of all pertinent data.
- B. Make the Register available to The Avrie Group, Inc. Project Manager for review at his request.

1.5. PROCESSING CHANGES INITIATED BY THE OWNER

- A. Should the Owner contemplate making a change in the Work or a change in the Contract Time of Completion, the Project Manager will issue a "Bulletin" to the Contractor.
1. Bulletins will be dated and will be numbered in sequence.
 2. The Bulletin will describe the contemplated change, and will carry one of the following instructions to the Contractor:
 - a. Make the described change in the Work at no change in the Contract Sum and no change in the Contract Time of Completion.
 - b. Make the described change in the Work, credit or cost for which will be determined in accordance with the General Conditions.
 - c. Promptly advise the Project Manager as to credit or cost proposed for the described change. This is not an authorization to proceed with the change.
- B. If the Contractor has been directed by the Project Manager to make the described change in the Work at no change in the Contract Sum and no change in the Contract Time of Completion, but the Contractor wishes to make a claim for one or both of such changes, the Contractor shall proceed with the change and shall notify the Project Manager as provided for the General Conditions Section "Change in Work".

- C. If the Contractor has been directed by the Project Manager to make the described change subject to later determination of cost or credit in accordance with the General Conditions Section "Change in Work", the Contractor shall:
 - 1. Take such measures as needed to make the change;
 - 2. Consult with the Project Manager and reach agreement on the most appropriate method for determining credit or cost for the change.
- D. If the Contractor has been directed by the Project Manager to promptly advise him as to credit or cost proposed for the described change, the Contractor shall:
 - 1. Analyze the described change and its impact on costs and time;
 - 2. Secure the required information and forward it to the Project Manager for review;
 - 3. Meet with the Project Manager as required to explain costs and, when appropriate, determine other acceptable ways to achieve the desired objective;
 - 4. Alert pertinent personnel and subcontractors as to the impending change and, to the maximum extent possible, avoid such work as would increase the Owner's cost for making the change, advising the Project Manager in writing when such avoidance no longer is practicable.

1.6. PROCESSING CHANGES INITIATED BY THE CONTRACTOR

- A. Should the Contractor discover a discrepancy among the Contract Documents, a concealed condition as described in the General Conditions Section "change in Work", or other cause for suggesting a change in the Work, a change in the Contract Sum, or a change in the Contract Time of Completion, he shall notify the Project Manager as required by pertinent provisions of the Contract Documents.
- B. Upon agreement by the Project Manager that there is reasonable cause to consider the Contractor's proposed change, the Project Manager will issue a Bulletin in accordance with the provisions described above.

1.7. PROCESSING BULLETINS

- A. Make written reply to the Project Manager in response to each Bulletin.
 - 1. State proposed change in the Contract Sum, if any.
 - 2. State proposed change in the Contract Time of Completion, if any.
 - 3. Clearly describe other changes in the Work required by the proposed change or desirable therewith, if any.
 - 4. Include full backup data such as subcontractor's letter of proposal or similar information.
 - 5. Submit this response in single copy.
- B. When cost or credit for the change has been agreed upon by the Owner and the Contractor, or the Owner has directed that cost or credit be determined in accordance with provisions in the General Conditions, the Project Manager will issue a "Change Order" to the Contractor.

1.8. PROCESSING CHANGE ORDERS

- A. Change Orders will be dated and will be numbered in sequence.
- B. The Change Order will describe the change or changes will refer to the Bulletin or Bulletins involved, and will be signed by the Owner and the Project Manager.
- C. The Project Manager will issue three copies of each Change Order to the Contractor.
 - 1. The Contractor promptly shall sign all three copies and return two copies to the Project Manager.
 - 2. The Project Manager will retain one signed copy in his file and will forward one signed copy to the Owner.
- D. If the Contractor disagree with the stipulated change in Contract Sum or change in Contract Time of Completion, or both:
 - 1. The Contractor promptly shall return two copies of the Change Order, unsigned by him, to the Project Manager with a letter signed by the Contractor and stating the reason or reasons for the Contractor's disagreement.
 - 2. The Contractor's disagreement with the Change Order shall not in any way relieve the Contractor of his responsibility to proceed with the change as ordered and to seek settlement of the dispute under pertinent provisions of the Contract Documents.

* * * END OF SECTION * * *

PROJECT MEETINGS

1. PART 1 - GENERAL REQUIREMENTS

1.1. RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other sections of these Specifications.

1.2. PROJECT MEETINGS

- A. Pre-Job Conference:
 - 1. Scheduled by project manager within 3 days after notice of award.
 - 2. Attendance: Representative of owner, roofing manufacturer, and contractor.
 - 3. Agenda:
 - a. Designation of responsible personnel.
 - b. Walk-over inspection.

1.3. PROGRESS MEETINGS

- A. Will be scheduled by The Avrie Group, Inc. representative weekly, as needed.
- B. Attendance: Owner, Contractor, Job Superintendent, Roofing Material Supplier, and Sub-Contractors, as appropriate.
- C. Minimum Agenda:
 - 1. Review of work progress.
 - 2. Field observations, problems, and decisions.
 - 3. Identification of problems, which impede planned progress.
 - 4. Maintenance of progress schedule.
 - 5. Corrective measures to regain projected schedules.
 - 6. Planned progress during succeeding work period.
 - 7. Coordination of projected progress.
 - 8. Maintenance of quality and work standards.
 - 9. Effect of proposed changes on progress, schedule, and coordination.

1.4. PRE-FINAL INSPECTION

- A. Contractor shall inform material supplier and building owner's representative prior to application of flood coat and gravel. Pre-final inspection will then be scheduled.
- B. Installations or details noted as deficient during inspection shall be repaired and corrected by applicator.
- C. Once repairs have been made, contractor shall inform material supplier and building owner's representative so a second inspection can be scheduled.
- D. Material supplier shall provide written approval of roofing system prior to application of flood coat, surfacing application and/or gravel surfacing.

1.5. FINAL INSPECTION

- A. Scheduled by roofing material manufacturer upon job completion.
- B. Attendance: Owner or designated representative, contractor, roofing material manufacturer.
- C. Minimum Agenda:
 - 1. Walkover inspection.
 - 2. Identification of problems, which may impede issuance of warranty.

* * * END OF SECTION * * *

PRE-CONSTRUCTION CONFERENCE

1. PART 1 - GENERAL

1.1. DESCRIPTION

- A. Work included: To help clarify construction contract administration procedures, the Project Manager will conduct a Pre-construction Conference prior to start of the Work. Provide attendance by the designated personnel.
- B. Related work: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Submittals, and other sections of these Specifications.

1.2. QUALITY ASSURANCE

- A. For those persons designated by the Contractor, his subcontractors, and suppliers to attend the Pre- construction Conference, provide required authority to commit the entities they represent to solutions agreed upon in the Conference.

1.3. SUBMITTALS

- A. To the maximum extent practicable, advise the Project Manager at least 24 hours in advance of the Conference as to items to be added to the agenda.
- B. The Project Manager will compile minutes of the Conference, and will furnish three copies of the minutes to the Contractor and required copies to the Owner. The Contractor may make and distribute such other copies as he wishes.

1.4. PRECONSTRUCTION CONFERENCE

- A. The Conference will be scheduled within 10 working days after the Owner has issued the Notice to Proceed, but prior to actual start of the Work.
- B. Attendance:
 - 1. Provide attendance by authorized representatives of the Contractor and major subcontractors.
 - 2. The Project Manager will advise other interested parties, including the Owner, and request their attendance.
- C. Minimum agenda: Data will be distributed and discussed on:
 - 1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, and the Project Manager;
 - 2. Channels and procedures for communication;
 - 3. Construction schedule, including sequence of critical work;
 - 4. Contract Documents, including distribution of required copies of Drawings and revisions;
 - 5. Processing of Shop Drawings and other data submitted to the Project Manager for review;
 - 6. Processing of field decisions and Change Orders;
 - 7. Rules and regulations governing performance of the work; and
 - 8. Procedures for safety and first aid, security, quality control, housekeeping, and related matters.

* * * END OF SECTION* * *

QUALITY CONTROL

1. PART 1 – GENERAL

1.1. RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other sections of these Specifications.
- B. Related Sections: GENERAL CONDITIONS “SUBSTITUTIONS” & SUBMITTALS

1.2. QUALITY CONTROL

- A. Contractor shall:
 - 1. Be experienced in waterproofing membrane and green roof installation and qualify as a certified contractor of the manufacturer/system being specified. **Letter from manufacturer verifying quality status is required with bid.**
 - 2. Be acceptable by owner and AGI.
- B. Roofing manufacturer shall:
 - 1. Be an Associate Member in good standing with National Roofing Contractor's Association (NRCA).
 - 2. Be recognized in roofing, and waterproofing and moisture survey industry.
 - 3. Be approved by owner.
 - 4. Material supplier shall supply a representative to perform periodic inspections throughout the course of the project. Written reports shall be submitted to the owner's representative and copies to the contractor.
- C. Any deficiencies noted during inspections shall be corrected by the contractor and approved in writing by the material supplier's representative.

1.3. RANDOM SAMPLING

- A. During course of work, owner/owner's representative, may secure samples of materials being used from containers at job site and submit them to an independent laboratory for comparison to specified material.
- B. If test results prove that a material is not functionally equal to specified material:
 - 1. Contractor shall pay for all testing.
 - 2. Owner will charge Contractor a penalty up to 20 percent of contract price when all work has been completed before test results become known.
 - 3. Owner will charge Contractor a penalty in proportion to amount of work completed before test results become known. Remaining work shall be completed with specified materials.

2. PART 2 - PRODUCTS

2.1. GENERAL

- A. Comply with Quality Control, References, Specification, and Manufacturer's data. Where conflict may exist, more stringent requirements govern.

- B. Provide primary products, including each type of roofing membrane, base flashings, miscellaneous flashing materials, from a single manufacturer, which has produced that type of product successfully for not less than ten (10) years. Provide secondary products (insulation, mechanical fasteners, lumber, and etc.) only as recommended by manufacturer of primary products for use with roofing system specified.

3. PART 3 - EXECUTION

3.1. SUBMITTALS

- A. **Provide building owner's representative a letter from the roof material manufacturer indicating that applicator is approved to install their products and will provide warranty for this installation.**

* * * END OF SECTION * * *

ROOFTOP OBSERVATION SERVICES

1. PART 1 – GENERAL

1.1. DESCRIPTION

- A. Work included:
 - 1. Rooftop observation services shall be provided by AGI as specified herein for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, and other sections of these Specifications.

1.2. SUBMITTALS

- A. Comply with pertinent provisions of General Conditions.
- B. Secure the Project Manager's advance approval of date and time for rooftop substrata inspection and pre- roofing construction meeting.
 - 1. Notify The Avrie Group, Inc., the roofing subcontractor, and other interested parties, and secure their agreement to attend.
 - 2. At least three calendar days prior to the pre-job conference, notify the Project Manager of the names of persons expected to attend.
- C. Records:
 - 1. Maintain a complete and legible file, in chronological order, containing a copy of each report, certificate, and other communication received relative to the work of this Section.
 - 2. Upon completion of the work of this Section, deliver a copy of the complete file to the Project Manager.

2. PART 2 – PRODUCTS

PART 3 – EXECUTION

COORDINATION

- A. Coordinate as necessary with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- 3.2** A. The Owner shall retain the project management services of AGI. Please include all observation fees in your base bid and/or alternate to be paid upon the execution of contract or purchase order.

- 1. Yake Elementary (All Sections) - \$25,120.00

3.3. PRE-ROOFING MEETING

- A. Not less than three or more than ten calendar days prior to scheduled start of roofing installation, conduct a rooftop inspection and pre-construction meeting at the job site.
 - 1. Except as other wise directed by the Project Manager, the Project Manager will be chairperson of the meeting, will take minutes of the meeting, and will record all agreements reached as a result of the inspection and meeting.

2. Visually inspect all substrata.
 - a. Determine general acceptability, and determine areas requiring further preparation.
 - b. Determine acceptable remedies for unacceptable areas.
3. Discuss proposed schedule for installation of the roofing, and reach agreement as to dates of start and finish of installation of the roofing.
4. Discuss proposed methods for installation of the roofing, and equipment and personnel to be used.
5. Discuss inspection methods to be used, reports to be issued by the roofing inspector, responsibilities and limits of responsibilities of the roofing inspector, and potential problems arising from use of methods not agreed to in the pre-roofing meeting.

3.4. INSPECTION DURING ROOFING INSTALLATION

- A. Verify that materials delivered to the job site are those approved by the Project Manager for use on this Work.
- B. Visually observe installation of roofing including, but not necessarily limited to:
 1. Verify use of installation procedures agreed upon in the pre-roofing meeting.
 2. Call attention of the subcontractor's representative on the job to unacceptable methods and unacceptable results.
 3. Report to the Contractor and to the AGI Supervisor if the subcontractor fails to correct unacceptable methods or unacceptable results.
- C. Make Final visual inspection of the entire roofing installation.
 1. Compile a list of items to be changed.
 2. Deliver a copy of the list to the subcontractor's representative on the job and to others as appropriate.
 3. Verify proper revision or replacement of all items on the list.

3.5. REPORTS

- A. Make daily written reports of roofing activities, delivering copies to the roofing contractor and others as agreed in the pre-construction meeting.
- B. Upon completion of the roofing installation, compile a comprehensive report covering activities performed under this Section, and deliver a copy of the report to the:
 1. Project Manager;
 2. Owner;
 3. Roofing subcontractor; and
 4. Others as agreed in the pre-roofing meeting.

3.6. LIMITS OF ROOF OBSERVER'S RESPONSIBILITIES

- A. During progress of the roofing installation, the roofing observer is required to:
 1. Make visual observations and compile reports described in this Section;
 2. Advise the roofing subcontractor's representative on the job as to unacceptable methods and unacceptable results when so observed by the roofing inspector.

- B. In connection with the roofing installation, “unacceptable methods and unacceptable results” mean methods and results other than:
 - 1. Those recommended by the manufacturer of the approved roofing system materials.
 - 2. Those required by pertinent regulations of governmental agencies having jurisdiction;
 - 3. Those required by these Specifications; and
 - 4. Those agreed upon in the pre-roofing meeting.
- C. The roof observer is not empowered to:
 - 1. Act for, or in lieu of, representatives of the governmental agencies having jurisdiction;
 - 2. Give directions to the Contractor, subcontractor, or workmen on the job;
 - 3. Revise any part of the Contract Documents; or
 - 4. Approve any change in the methods agreed upon in the pre-roofing meeting.
- D. Failure of the roof observer to observe unacceptable methods or unacceptable results during progress of the Work will not absolve the Contractor from his responsibility to complete the Work in accordance with the specified requirements and the agreed methods.

* * * END OF SECTION * * *

MATERIAL AND EQUIPMENT

1. PART 1 – GENERAL

1.1. RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions.
- B. Related sections: *SUMMARY OF WORK*

1.2. 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 manufacturers name.
- 2. Deliver materials in sufficient quantity to allow continuity of work.

B. Storage of Materials:

- 1. Store EPDM and Insulation in dry area protected from water or extreme humidity.
- 2. Stack insulation on pallets.
- 3. Remove plastic packing shrouds. Cover all stored materials with canvas tarpaulin top to bottom. Secure tarpaulin.
- 4. Rooftop storage: Disperse material.

C. Material Handling:

- 1. Handle plies and insulation 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.

D. Environmental Requirements:

- 1. Do not work in rain, snow or in presence of water.

* * END OF SECTION* * *

CONTRACT CLOSE-OUT

1. PART 1 – GENERAL

1.1. DESCRIPTION

A. Work included:

1. Provide an orderly and efficient transfer of the completed Work to the Owner.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and other sections of these Specifications.

1.2. QUALITY ASSURANCE

- A. Prior to requesting inspection by the Project Manager, use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for the requested inspection.

1.3. PROCEDURES

A. Substantial Completion:

1. All roofing and components are in place and final surface applied and are water tight according to specifications with alternates approved by Project Manager and Building Owner.
2. Within a reasonable time after receipt of the list, the Project Manager will inspect to determine status of completion.
3. Should the Project Manager determine that the Work is not substantially completed:
 - a. The Project Manager promptly will so notify the Contractor, in writing, giving the reasons therefore.
 - b. Remedy the deficiencies and notify the Project Manager when ready for re-inspection.
 - c. The Project Manager will re-inspect the Work.
4. When the Project Manager concurs that the Work is substantially complete:
 - a. The Project Manager will give notification in writing, accompanied by the Contractor's list of items to be completed or corrected, as verified by the Project Manager.
 - b. The Project Manager will submit the written statement to the Owner and to the Contractor for their written acceptance.

B. Final Completion:

1. Prepare and submit a written statement at final completion.
2. Certify that:
 - a. Contract Documents have been reviewed;
 - b. Work has been inspected for compliance with the Contract Documents;
 - c. Work has been completed in accordance with the Contract Documents;
 - d. Equipment and systems have been tested as required, and are operational;
 - e. Work is completed and ready for final inspection.

3. The Project Manager will make an inspection to verify status of completion.
 4. Should the Project Manager determine that the Work is incomplete or defective:
 - a. The Project Manager promptly will so notify the Contractor, in writing, listing the incomplete or defective work.
 - b. Remedy the deficiencies promptly, and notify the Project Manager when ready for re-inspection.
 5. When the Project Manager determines that the Work is acceptable under the Contract Documents, he will request the Contractor to make closeout submittals.
- C. Close-out submittals include, but are not necessarily limited to:
1. Project Record Documents.
 2. Operation and maintenance data for items so listed in pertinent other Sections of these Specifications, and for other items when so directed by the Project Manager;
 3. Warranties and bonds;
 4. Evidence of payment and release of liens;
 5. List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.
- D. Final adjustment of accounts:
1. Submit a final statement of accounting to the Project Manager, showing all adjustments to the Contract Sum.
 2. If so required, the Project Manager will prepare final Change Order showing adjustments to the Contract Sum, which was not made previously by Change Orders.

1.4. INSTRUCTION

- A. Instruct the Owner's personnel in proper operation and maintenance of systems, equipment, and similar items which were provided as part of the Work.

* * END OF SECTION * * *

WARRANTIES

1. PART 1 – GENERAL

1.1. WARRANTY – CONTRACTOR

A. The Contractor shall submit at the time of final inspection, and as a condition of final payment, a written guarantee in which he agrees to maintain the entire roof system(s) in a completely watertight condition at no cost to the Owner for five (5) years from date of final acceptance; except the water tightness guarantee shall not be enforced when the Contractor can prove water damage was caused by the Owner.

1. Contractor is obligated to execute an annual inspection to ensure roof performance through first five (5) years with a written executive summary submitted to owner.

1.2. WARRANTY – MANUFACTURER / ROOF SYSTEM

- A. Quotations will include a price for a **twenty (20) year, full system no-dollar-limit warranty**, to be provided by the material supplier. This warranty shall not be pro-rated. This warranty shall include all perimeter metal systems. **No additional cost to customer during period of warranty.**
- B. Upon project completion and material supplier acceptance, material supplier will issue Owner a no-dollar-limit, non pro-rated, **full system warranty to be effective immediately**, not when contractor completes payment to material supplier.
- C. **Warranty shall cover all components installed under this specification. This includes all labor and materials necessary to correct any deficiencies during the life of the warranty.**
- D. The Contractor shall certify by letter from the manufacturer of the roof system, compliance with the above guarantee requirements. Letter shall certify that the Total Systems Warranty required by these specifications will be issued upon proper completion of the roof system installation.
- F. Original copies of the Manufacturer and Contractor warranties shall be sent to The Avrie Group, Inc. for final approval. The Avrie Group will forward original warranties to the Owner.

* * * END OF SECTION * * *

ASBESTOS ABATEMENT AND DISPOSAL

1. PART 1-GENERAL

1.1. RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other sections of these Specifications.

1.2. DEMOLITION AND SALVAGE

A. SUMMARY:

- 1. This portion of the specifications governs the demolition, salvaging (to the extent specified) disposal of materials resulting from the abatement. All demolition and disposal shall meet the local requirements.

2. PART 2-PRODUCTS (NOT APPLICABLE)

3. PART 3-EXECUTION

3.1. DEMOLITION & DISPOSAL

- A. Contractor shall provide written notification to the EPA, a minimum of ten days prior to commencement of the work, that asbestos-containing roofing materials will be removed on this project. Notification shall be on the standard EPA form and copies forwarded to the owner and AGI.
- B. The entire roof area shall be considered the asbestos work area. Contractor shall furnish and install an EPA approved warning sign at the interior or exterior roof access ladder/roof hatch.
- C. During removal of asbestos-containing materials (ACM), only authorized persons of the contractor, representatives of the owner or the consultant shall be allowed on the roof.
- D. During all cutting of the existing ACM, a wetting mist shall be applied to the roof membrane as cutting is being performed.
- E. It is recommended that all workers coming in contact with the ACM during the removal activity wear proper respiratory protection in addition to proper protective clothing. To be in compliance with the Occupational Safety and Health Administration (OSHA), a person shall have prior medical approval and be properly fit tested to wear a respirator.
- F. Cutting and Removal: If the roofing material is removed by cutting with a sharp-edged instrument in a sawing-like manner (using a toothed-edge blade), the EPA recommends that a certified asbestos removal contractor perform the cutting and clean up procedures.
- G. The asbestos-containing roofing material debris-waste shall be removed and placed inside a properly labeled six-mil disposal polyethylene (poly) bag and sealed. The material shall be placed inside a second six-mil disposal poly bag and properly sealed. "Debris/waste: Shall be the dirt, dust debris created during the process of cutting the existing roof membrane into pieces to facilitate removal. All bagged asbestos-containing roofing material debris/waste shall be carefully lowered into appropriate waste containers without damage to the ACM bagging. Prior to leaving the site each individual bag shall have an EPA label affixed with the name of the ACM waste generator and the location of the waste generated.

- H. After cutting and cleaning up the ACM debris/waste, all remaining asbestos-containing roofing material shall be carefully removed and lowered into appropriate waste containers without damage to the above noted previously bagged ACM debris.
- I. Lowering shall be via hand carrying, lift equipment, or enclosed chute. Throwing or dropping asbestos-containing roofing material or bagged ACM debris/waste over the edge will not be permitted.
- J. All ACM debris/waste shall be transported to a disposal site approved by the EPA. Transportation and disposal shall be in accordance with the current EPA-NESHAP regulations. Contractor shall maintain asbestos waste shipment records, with copies furnished to the owner for any asbestos waste removed from the site.
- K. Removal of all asbestos-containing materials will be done in strict accordance with all applicable government and local rules and regulations. The roofing contractor will indemnify the Building Owner and The Avrie Group, Inc. for all expenses, legal fees, third party liability and cost incurred, due to the improper removal and/or disposal of asbestos-containing materials.

* * *END OF SECTION* * *

DEMOLITION AND SALVAGE

1. PART 1 GENERAL

1.1. RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions.
- B. Related sections: *FLASHING AND SHEET METAL*

1.2. DEMOLITION AND SALVAGE

A. SUMMARY:

- 1. This portion of the specification governs the demolition, salvaging (to the extent specified by building owner), and disposal of materials resulting from the demolition.

2. PART 2 – PRODUCTS (NOT APPLICABLE)

3. PART 3 – EXECUTION

3.1. DEMOLITION

- A. Demolition operations shall be performed in such a manner that no damage to existing facilities or injury to persons will result from the performance of the Work.
- B. The contractor shall review and visually survey areas marked for demolition before beginning demolition.
- C. The use of equipment or wrecking devices shall be subject to the approval of building owner; however, such approval does not relieve the contractor of responsibilities described above.
- D. **A debris chute and/or a crane with dump box shall be used. A tarpaulin shall be used to cover all walls adjacent to dumpster and ladder access.**
- E. All dumpsters are to be located on per owner's direction. The contractor will be responsible for any damage caused to areas in close proximity to dumpsters. **Dumpsters are to be removed daily.**

3.2. PREPARATION

A. Protection:

- 1. Contractor shall be responsible for protection of property during course of work. Lawns, shrubbery, paved areas, and building **inside and out** shall be protected from damage. Repair damage at no extra cost to owner.
- 2. Roofing, flashing, and /or insulation shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather. **PHASED CONSTRUCTION IS NOT ACCEPTABLE.**
- 3. At start of each workday, drains within daily work area shall be plugged. Plugs to be removed at end of each workday or before arrival of inclement weather.
- 4. At end of each working day, partial installation shall be sealed with water stops along edges to prevent water entry.
- 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. Provide at site prior to commencing removal of debris, a dumpster or dump truck to be located adjacent to building where directed by owner. Construct an enclosed chute from roof for removal of debris from roof area. Protect building surfaces at chute/set-up areas with 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/daily.** Removed material to be disposed from roof as it accumulates.
7. 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.

B. Surface Preparation:

1. Remove designated roofing and insulation to the structural deck.
2. Remove all base flashings.
3. Remove metal counter flashings as required.
4. Remove unused equipment as designated by building owner's representative.
5. Dispose of all materials unless designated by building owner's representative for re-installation or salvage.
6. Sweep roof deck clean. Dirt, gravel, and foreign materials within flutes of metal deck are not acceptable.

3.3. ASBESTOS

- A. See Asbestos and Abatement page 46-47. Per MIOSHA, OSHA, EPA, DNR and NRCA requirements.

3.4. SALVAGE

- A. Material as specified and recovered from demolition operations shall remain the property of building owner. Other materials shall become the property of the contractor. Material salvaged for building owner shall be placed in storage areas designated by building owner. Material that is not salvaged for building owner shall be removed from the site or discarded in an on-site disposal area designated by building owner.

* * * END OF SECTION* * *

WOOD FRAMING

1. PART 1 – GENERAL

1.1. RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other sections of these Specifications.
- B. Related sections: *FLASHING AND SHEET METAL*

1.2. SUMMARY

- A. This portion of the specification sets forth the general requirements, including the quality and type of materials required for the installation of all lumber used for wood curbs, nailing strips, miscellaneous blocking material, unexposed fillers, fascias, edging strips, etc.
- B. Applicable roof sections:
 - 1. All areas indicated on roof plan.

1.3. STORAGE

- A. All material specified herein shall be stored (after delivery to the site) so that it will be fully protected from damage and weather, and shall be piled to prevent warpage. All lumber shall be fully protected to maintain the original required moisture content as specified in item titled "Moisture Content".

1.4. OTHER REQUIREMENTS

- A. Dimensions indicated on the drawings are nominal dimensions (except where details show actual sizes) and shall be subject to the standard reductions required for surfacing or tolerances permitted by the grading rules. Unless otherwise indicated on drawings, all material shall be S4S (surfaced four sides).

1.5. PROTECTION

- A. All finished work shall be adequately protected against damage from any source.

1.6. COORDINATION

- A. Carpenters shall coordinate their work with that of the other trades so that progress continues interruption.

2. PART 2 - PRODUCTS

2.1. WOOD - FRAMING AND CURBS GRADING RULES, GRADES, AND SPECIES

- A. Lumber: Southern Pine, Yellow Pine, Douglas Fir, Spruce, Ponderosa Pine, Larch or Hemlock and shall meet the following minimum grade requirement of construction standard (75% #1 and 25% #2); free from warping and visible decay. Lumber shall be graded according to the standard grading rules of the Southern Pine Inspection Bureau, the YEST Coast Lumber Inspection Bureau, or the YESTern Wood Products Association.

2.2. MOISTURE CONTENT

- A. All lumber shall be air-dried or kiln-dried before treatment, so that the moisture content is not more than 19%. After treatment, it shall be kiln-dried at temperatures not exceeding 160 degrees F. (71 degrees C) so that the moisture content is not more than 19% at time of shipment.

2.3. DECAY-RESISTANT TREATMENT

- A. Lumber in contact with roofing or acting as fascias, and all other exterior lumber, shall be pressure- treated with a waterborne preservative in accordance with AWWPA Specification P5. Creosote and oil- borne preservatives are not acceptable.
- B. Treating processes, material conditions, plant equipment, and other pertinent requirements shall conform to AWWPA Specifications C1 and C2 for specific kind of lumber and type of preservative to be used. Retention shall be as required for intended use.
- C. All treated lumber shall bear the mark of a code recognized third party agency such as the AWWPA.

2.4. PLYWOOD

- A. Grade: CDX or Cyme exterior Grade.
- B. Description: 5/8" thick.

2.5. MECHANICAL FASTENERS / WOOD TO STEEL DECK

- A. Roofgrip screw with Climaseal coating; plastic disc - Buildex Div. of ITW, Itasca, IL.
- B. Dekfast screw with Senti coating: plastic disc - Construction Fasteners, Inc., Wyomissing, PA.
- C. From Fabco Fastening Systems, YES Newton, PA: Insul-Fixx screw with Fabcote coating; plastic plate, Plate-Fixx screw with Fabcote coat; plastic disc.
- D. Kwik-Deck screw with Oxyseal coating; plastic disc - Atlas Bolt & Screw Div., Trans Union Fastener Corp., Ashland, OH.
- E. Olympic #12-11 Standard Steel Deck Screw or #14-10 Heavy Duty All Purpose Screw with CR-10 coating; three inch diameter plastic - Olympic Manufacturing Group, Inc., Agawam, MA.
- F. Glasfast (plastic disc) - Owens-Corning Fiberglas Corp., Toledo, OH.
- G. Perma Fastener screw with permaseal coating; plastic plate - International Permalite, Inc., Oak Brook, IL.
- H. Screw Length: Sufficient to engage steel deck 1/2 inch.

2.6. WOOD TO WOOD

- A. Type: Galvanized, common, annular ring nail. Length: Sufficient to penetrate underlay blocking 1-1/4 inches.
- B. Acceptable Manufacturers:
 - 1. Hillwood Manufacturing Co., Cleveland, OH.
 - 2. Independent Nail, Inc., Bridgewater, MA.
 - 3. W.H. Maze Co., Peru, IL.
 - 4. National Nail Corp., Grand Rapids, MI.

2.7. WOOD TO MASONRY

- A. Tapcon 1/4" diameter, Phillips pan head anchor - Buildex Div. of ITW, Itasca, IL.
- B. Confas - Construction Fasteners, Inc., Wyomissing, PA.
- C. Con-fixx - Fabco Fastening Systems, Newton, PA.
- D. #14-10 Heavy Duty all Purpose Screw – Olympic Manufacturing Group, Inc., Agawam, MA.
- E. Tru-Fast fastener (stainless steel) - The Tru-Fast Corp., Bryan, OH.

F. Length: Sufficient to provide 1-1/2 inch embedment.

2.8. WOOD TO HOLLOW MASONRY

A. Sleeve Anchor by Hilti Fastening Systems, Tulsa, OK.

B. Rawly Hollow Masonry Anchor by the Rawlplug Co., Inc., New Rochelle, NY.

C. Length: As recommended by manufacturer.

3. PART 3 - EXECUTION

3.1. CARPENTRY

A. At roof edge to receive metal fascia, around all roof top penetration perimeters, and under any flashing component that is to have a roof flange mechanically fastened to roofing substrate.

B. Mechanically attach wood blocking. Blocking thickness: Equal to final insulation thickness. Width: Six inches nominal.

C. Fasteners shall be installed in two rows staggered. Spacing in any one row shall not exceed 24 inches within eight feet of outside corners; spacing shall not exceed twelve inches in any one row.

D. Where required, offset blocking layers twelve inches, weave corners.

E. When preservative treated wood is cut, the cut end shall be treated in accordance with AWPA Specification M4.

F. Lumber shall be accurately cut to the work requirements and shall be well fastened.

G. Bolted fastenings shall have washers of adequate size under both heads and nuts. Nails shall be of correct size and quantity for proper fastening. Oversized nails that will result in splitting shall not be used. All fasteners shall be galvanized per ASTM A 153.

* * * END OF SECTION * * *

ROOF INSULATION

1. PART 1 — GENERAL

1.1. RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other sections of these Specifications.

2.1. SUMMARY

- A. This portion of the specification describes materials and workmanship required for the installation of insulation over base sheets and vapor retarder prior to installing the roofing membrane. All materials described herein shall be furnished and installed by the roofing contractor unless specifically noted otherwise.

1.3. PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Insulation shall be delivered to the site in an undamaged and dry condition. Material received, which is not dry or is otherwise damaged shall be rejected.
- B. Storage under polyethylene or similar non-breathing film stock shall not be permitted.
- C. Proper storage on or off the site shall be the responsibility of the roofing contractor.
- D. Any unused insulation remaining on the roof at the end of the workday shall be returned to storage.

1.4. INSULATION - GENERAL

- A. Insulation boards shall be full size except when cutting is required at roof edges and openings. Boards that are broken, cracked, have been exposed to moisture, or are otherwise damaged shall not be used.
- B. The proper installation and fit of wood nailer, blocking, and other rough carpentry in appropriate locations shall be verified prior to installation of roof insulation.
- C. Caution shall be exercised with construction traffic to avoid damage to new insulation. Breaking or crushing of insulation is unacceptable and any damaged insulation shall be replaced at the roofing contractor's expense.
- D. Insulation shall be laid with end joints staggered and all joints tight. However, boards shall not be forced into place. **Any gaps in the insulation joints 1/4" or wider need to be filled with mastic or insulation.**
- E. No more insulation shall be applied during any work period than can be covered by all plies of roofing during the same work period. At the end of the work period, temporary edge seals shall be installed to protect the roof insulation. Upon resumption of work, they shall be removed.
- F. Insulation surfaces shall be cleared of all debris before roofing is placed.

2. PART 2 — PRODUCTS

2.1. INSULATION

A. Base Layer (LOW SLOPED AREAS):

1. Type: Closed cell Polyiso. Must meet new ASTM C-1289-02 requirements.
2. Thickness: Minimum 1.5 inch.
3. Nominal size: 48" x 96".

B. Second Layer (LOW SLOPED AREAS):

1. Type: Tapered closed cell Polyiso, ASTM C-1289-02 with a perforated black glass reinforced mat laminated to the face. Designed by manufacturer of roof system.
2. Slope: ¼ "per foot.
3. Nominal size 48" x 96".

C. All insulation materials shall be approved by the manufacturer of primary roof materials. Samples should be provided to the manufacturer and written approval from the manufacturer of primary roof materials is required prior to ordering these materials for the project.

2.2 INSULATION SECUREMENT (BASE BID)

A. Over properly prepared deck:

1. Install first layer:

- a. In all areas mechanically attach all insulation boards following Factory Mutual I-60 pattern fastening patterns. Fasteners shall be warranted against corrosion and back out for the life of the roof warranty. No edge joints should meet from layer to layer.
 - 1) Protect interior from all DEBRIS AND BITUMEN.

2. Install second layer:

- a. Fully adhere to first layer of insulation in a uniform and continuous layer of insulation adhesive. Walk insulation boards to insure full and proper adhesion. Stagger all joints from base layer a minimum of six inches.

B. Cut and fit insulation boards where roof deck intersects vertical surfaces. Cut board 1/4 inch from vertical surface.

C. Lay insulation in 48-inch wide courses. No edge joints should meet layer to layer.

D. Fill all voids between boards exceeding 1/4" in width with insulation to mastic.

E. **GYM REQUIRES BOTH LAYERS TO BE INSTALLED WITH ADHESIVE ONLY (EXPOSED DECK).**

3. PART 3 — EXECUTION

3.1. CONDITION OF DECK

- A. Prior to installing insulation, deck shall be inspected by The Avrie Group, Inc. and all deficiencies corrected through change order process (refer to General Conditions).
- B. The roofing contractor shall perform all other work of preparing the deck. When insulation is applied, the deck shall be dry and free of dew, frost, ice, and snow.
- C. The roofing contractor shall notify the building owner's representative of any improper existing conditions.

*** END OF SECTION ***

STEEL DECK REHABILITATION

1. PART 1 - GENERAL

1.1. RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other sections of these Specifications.

1.2. SUMMARY

- A. Metal deck repairs shall be done as required, creating a sound substrate for new roof installation. Deck repairs may only be done with the written approval by building owner's representative.

2. PART 2 - PRODUCTS

2.1. METAL ROOF DECK

- A. Sheet steel: ASTM A611-84, Grade C structural quality; with factory applied prime coat.
- B. Metal roof deck: Gage, rib depth, rib configuration - match existing; three span; lapped and stitched joints.
- C. Butt and finish strips: 20 gauge sheet steel.
- D. Acceptable manufacturers:
 - 1. Bowman Construction Products, Heidelberg, PA.
 - 2. Consolidated Systems, Inc., Columbia, SC.
 - 3. Mac-Fab Products, Inc., St. Louis, MO.
 - 4. Merco Manufacturing, Inc., Dallas, TX.
 - 5. Roll Form Products, Inc., Boston, MA.
 - 6. Roof Deck, Inc., Hightstown, NJ.
 - 7. Southeast Metal Deck, Inc., Chesapeake, VA.
 - 8. United Steel Deck, Inc., South Plainfield, NJ.
 - 9. Verco Manufacturing Co., Phoenix, AZ.
 - 10. Vulcraft Division, Nucor Corp., Charlotte, NC.
 - 11. Wheeling Corrugating Co., Division Wheeling-Pittsburgh Steel Corp., Wheeling, WV.
- E. Metal roof deck fasteners: TEKS by Buildex Div. of ITW, Itasca, IL.
 - 1. Deck side lap stitching: 10-16 x 3/4 inch Hex Washer Head, Teks/1 with pilot point.
 - 2. Deck to bar joist: 12-24 x 7/8 inch Hex Washer Head, TEKS/4.
 - 3. Deck to structural steel: 12-24 x 1-1/4 inch Hex Washer Head, TEKS/5.

F. Rust inhibitive paint:

Test	Typical Value	Test Method
Asbestos Content	0%	EPA 600/M4-82-020
Viscosity (Ford Cup #4)	23-35 seconds	ASTM D 1200
Density @ 77°F	8.5 lbs/gal.	ASTM D 1475
Solids by Weight	30-35%	ASTM D 1644

3. PART 3 - EXECUTION

3.1. METAL ROOF DECK REPAIRS

- A. Deck Reinforcement: Install sheet steel reinforcement profiled to existing decking configuration over all rusted openings 16 sq. inches or less. If two or more rusted openings existing in same deck section, replace deck.
- B. Deck Re-attachment:
 - 1. Mechanically re-attach loose sections of deck to steel support members twelve inches o.c.
- C. Side laps:
 - 1. Nestable side lap: Mechanically fasten 18 inches o.c.
 - 2. Interlocking side lap: Button punch 18 inches o.c.
- D. Deck Replacement:
 - 1. Saw cut at bar joist/beam center, remove decking. Minimum length: Three spans.
 - 2. Erect metal decking according to SDI Design Manual. If unable to lap, butt to adjacent deck. Minimum bearing on steel supports: one inch.
 - 3. Mechanically fasten side laps 18 inches o.c. maximum.
 - 4. Fasten deck to steel support members at ends and intermediate supports with mechanical fasteners twelve inches o.c. maximum.
 - 5. Install six-inch wide sheet steel butt strip where deck ends butt. Mechanically fasten butt strips to steel deck six inches o.c.
- E Deck Protection: Apply rust inhibitive paint over surface rust.

3.2. CONDITION OF DECK

- A. Prior to installing insulation, deck shall be inspected by The Avrie Group, Inc. and all deficiencies corrected through change order process (refer to General Conditions).
- B. The roofing contractor shall perform all other work of preparing the deck. When insulation is applied, the deck shall be dry and free of dew, frost, ice, and snow.
- C. The roofing contractor shall notify the building owner's representative of any improper installations.

*** END OF SECTION ***

ROOF SYSTEM

ALL ROOF SYSTEM DETAILS MUST MEET OR EXCEED MANUFACTURER REQUIREMENTS FOR WARRANTY SPECIFIED

1. PART 1 — GENERAL

1.1. RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other sections of these Specifications.
- B. Related Sections: *FLASHING AND SHEET METAL*

1.2. GENERAL

- A. This portion of the specification sets forth the general requirements and describes materials and workmanship for installing the built-up roofing system.
- B. All materials described herein shall be furnished and installed by the roofing contractor unless specifically noted otherwise.

1.3. INSPECTION

- A. Verify installation conditions as satisfactory to receive work.
- B. Do not install new 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 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 roofing system.
- E. Start of work by the roofing contractor shall imply approval of deck surfaces and site conditions, and no claim in this respect will be considered valid in case of failure of the roofing components within the guarantee period.
- F. The roofing contractor shall notify the owner in writing of any defects in the substrate, and work shall not proceed until defects have been corrected.

1.4. SCHEDULE

- A. Installation of the new roofing system should be scheduled after all other major rooftop construction is complete to minimize potential for damage to the new roofing system by others.

1.5. QUALITY ASSURANCE

- A. The roofing and associated work shall be contracted to a single firm, hereafter called the roofing contractor, specializing in the type of roofing required, so that there will be undivided responsibility for the performance of the work.

- B. Prior to starting work, the roofing contractor shall submit three copies of the manufacturer's technical data, including material specification and installation procedures. Technical data shall include flammability, toxicity, and carcinogenic characteristics (if any) of all materials (MATERIAL SAFETY DATA SHEETS).

1.6. JOB CONDITIONS

- A. Roofing work shall proceed only when weather conditions will permit the work to proceed in accordance with accepted procedures.

1.7. FIRE AND SMOKE PROTECTION

- A. No Kettles shall be located on site without prior approval. They shall not be positioned on roof deck. Fire extinguishers shall be provided for immediate use. **A two-hour fire watch is required when daily operations are concluded.**

1.8. SAFETY PRECAUTIONS

- A. All OSHA safety rules shall be adhered to in the execution of this work. The fumes of hot bituminous materials may be toxic to some workmen. Adequate protection shall be provided to prevent burns and skin irritation.
- B. See Section **General Conditions "Safety"**.

1.9. ROOF TRAFFIC

- A. After work on roof is started, no traffic will be permitted on the roof other than that necessary for the roofing application and inspection. Materials shall not be piled on the roof to the extent that design live loads are exceeded. Roofing materials shall not be transported over unfinished or finished roofing or existing roofs unless adequate protection is provided.
- B. Any damage to existing roofs shall be repaired as directed by the owner's representative at no expense to the owner.

1.10. PROTECTION AGAINST SOILAGE

- A. Surface of walls, walks, pavements, adjacent property, etc., shall be protected as necessary to prevent soiling or other damage resulting from the application of roofing or transporting of materials. If surfaces are stained or damaged in any way, they shall be restored by this contractor, at no cost to the owner, in a manner acceptable to the owner.

1.11. PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Related Section: *MATERIAL AND EQUIPMENT*
- B. Materials shall be delivered to the site in an undamaged and dry condition.
- C. Material received, which is not dry or is otherwise damaged shall be rejected. Storage should be either in a heated building or in a warehouse or similar type structure at ambient temperature and humidity conditions such that the moisture content of felts at time of use does not exceed the equilibrium moisture content (EMC) at 75% RH.
- D. Storage under polyethylene or similar non-breathing film stock shall not be permitted. Rolls of flashing felts shall be stacked on their ends and never in contact with the ground. Bituminous emulsions shall be stored at temperatures above freezing.

- E. Proper storage on or off site shall be the responsibility of the roofing contractor.
- F. Any unused roofing felts remaining on the roof at the end of the workday shall be returned to storage.

1.12. WORK SEQUENCE

- A. **Once work is started, it shall continue without undue delay until that section is completed before starting another. The installation of flashings shall follow application of the roofing without delay.**

1.13. INSPECTION

- A. Related Section: *PROJECT MEETINGS*
- B. Upon completion of the installation, an inspection shall be made by a representative of the owner to as certain that the roofing system has been installed according to the supplier's published specifications and details. The warranty will be issued upon approval of the installation. **This process shall be complete within 21 days of the final inspection.**

1.14. ADJUSTMENT AND REPAIR

- A. Any roofing damaged or misapplied shall be repaired or replaced as required by the owner's representative at no expense to the owner.

1.15. ROOFING WARRANTY

- A. Related Section: *WARRANTIES*
- B. Upon completion and acceptance by the owner, the Roof System Warranty will be issued by the roofing system manufacturer. All sheet metal work executed is included in the manufacturer's warranty.

* * * END OF SECTION * * *

FULLY ADHERED EPDM ROOF SYSTEM

Refer to manufacturer web site for specific project details. All details must meet warranty requirements as specified herein.

1. PART 1 - GENERAL

1.1. SECTION INCLUDES:

- A. Substrate preparation.
- B. Wood nailer installation.
- C. Membrane installation.
- D. Membrane flashing.

1.2. RELATED SECTION:

- A. Roof Insulation
- B. Warranty
- C. Joint Sealers and Caulking
- D. Roof Drains

1.3. REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. D297: Methods for Rubber Products, Chemical Analysis.
 - 2. D412: Test Methods for Rubber Properties in Tension.
 - 3. D471: Test Methods for Rubber Property, Effect of Liquids.
 - 4. D573: Test Method for Rubber, Deterioration in an Air Oven.
 - 5. D746: Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
 - 6. D751: Method of Testing Coated Fabrics.
 - 7. D816: Methods of Testing Rubber Cements.
 - 8. D1149: Test Method for Rubber Deterioration, Surface Ozone Cracking in a Chamber.
 - 9. D2240: Test Method for Rubber Property - Durometer Hardness.
 - 10. E96: Test Methods for Water Vapor Transmission of Materials.

1.4. SYSTEM DESCRIPTION

- A. Non-reinforced elastomeric sheet roofing, directly adhered to manufacturers roof insulation using manufacturers bonding adhesive. The roof insulation is secured to the roof substrate as specified, and approved by the membrane manufacturer.

1.5. SUBMITTALS

General: Submit the following according to Conditions of contract.

- A. Shop Drawings: Submit in accordance with Specifications, indicating roof size, location and type of penetrations, perimeter and penetration details, roof insulation makeup and layout that have been accepted by an authorized manufacturer's representative.
- B. Warranty: Submit two copies of manufacturer's Total System Warranty for elastomeric sheet roofing.
- C. Submit manufacturer's installation instructions.

1.6. QUALITY ASSURANCE

- A. Obtain EPDM single-ply membrane roofing from specified manufacturer. Provide secondary materials only at the approval by The Avrie Group, Inc.
- B. Roofing applicator shall be certified in writing by manufacturer as a current licensed manufacturer Master Contractor or have comparative license through approved as manufacturer.
- C. A single installer shall perform the work of this Section and shall have completed projects of similar scope and complexity.
- D. Provide labeled materials that have been tested and listed by UL in the "Building Materials Directory".

1.7. DELIVERY, STORAGE AND HANDLING

- A. Deliver roofing materials, insulation and accessories in manufacturer's protective containers with labels intact and legible, and comply with manufacturer's instructions for storage and handling.
- B. Handle rolled goods to prevent damage.
- C. Store all materials on clean raised platforms with weather protective covering in accordance with provisions.

1.8. ENVIRONMENTAL REQUIREMENT

- A. Weather Conditions: Proceed with elastomeric sheet roofing work only when weather conditions comply with manufacturer's recommendations and will permit materials to be applied and cured in accordance with those recommendations. Do not exceed temperature limitations recommended by roofing manufacturer.

1.9. WARRANTY

- A. Contractor shall provide a twenty (20) year single source, total system warranty after completion and final inspections have been performed. Warranty shall include but is not limited to insulation, edge metal, membrane and flashing materials as well as workmanship on the part of the roofing contractor.
- B. Contractor warranty: Five (5) year labor and material. **Contractor guarantees positive drainage. Ponded water is unacceptable.**

2. PART 2 - PRODUCTS

2.1. ROOF INSULATION

- A. Insulating materials must be provided by membrane manufacturing to comply with deck substrate, base sheet and roof system specified.
1. Polyiso ASTM C-1289.
 - a. Tapered Insulation system to be designed by Manufacturer.
 - b. Flat stock to be supplied my membrane manufacturer.

2.2. ELASTOMERIC SHEET ROOFING SYSTEM COMPONENTS

- A. Manufacturer: Carlisle Syntec, Firestone Building Products Company, Johns Mansville, or approved equal.
- C. Membrane Material: Nominal .060-inch thick, **Reinforced**, Ethylene Propylene Diene Monomer (EPDM) membrane conforming to the following physical properties:

Property:	Test Method:	Specification:
Specific Gravity	ASTM D-297	1.15 +/- 0.05
Tensile Strength, Minimum, psi (MPa)	ASTM D-412, Die C	1305 (9)
Elongation, Minimum, %	ASTM D-412, Die C	300
Tear Resistance, lbf / in (kN / M)	ASTM D-624, Die C	150 (26.3)
Ozone Resistance, 166 hours @ 100 pphm @ 104°F with 50% extension	ASTM D-1149	No Cracks
Heat Aging, 28 days @ 240°F Tensile Strength, Minimum psi (MPa) Elongation, Minimum %	ASTM D-412 ASTM D-412	1205 (8.3) 200
Brittleness Point, max., °F, °C	ASTM D-2137	-49 (-45)
Water Absorption, change in weight after immersion in water for 166 hours @ 158°F, %	ASTM D-471	+8, -2
Tolerance On Nominal Thickness, %	ASTM D-412	+/- 10
Water Vapor Permeability, Perm-Mils	ASTM E-96	2.0

- C. Roof Flashing:

1. Uncured EPDM membrane.
 2. Self adhering flashing or approved as.
- D. Tape Adhesive: EPDM-based, formulated for compatibility with EPDM membrane and high-solids primer.
 - E. Adhesive Primer: High-solids, butyl based primer formulated for compatibility with EPDM membrane and tape adhesive.
 - F. Splice Adhesive: SA-1065 Butyl-based, formulated for compatibility with EPDM membrane.
 - G. Bonding Adhesive: Neoprene-based, formulated for compatibility with EPDM membrane and a wide variety of substrate materials, including masonry, wood, and insulation facings.
 - H. Pourable Sealer: Two-part urethane, two-color for reliable mixing.
 - I. Termination Bar: 1.3" X 0.10" thick aluminum bar with integral caulk ledge.

2.3. MISCELLANEOUS

- A. Roof Walkway Pads:
 1. EPDM Walkway Pads, 0.30" X 30" X 30" installed with seam tape.
- B. Nailers, Blocking:
 1. Re-roofing: Preservative-treated for rot resistance, No. 2 or better dimensional lumber.

3. PART 3 - EXECUTION

3.1. GENERAL

- A. Furnish and completely install Fully Adhered EPDM Roofing System in accordance with manufacturer published specifications and details. This section is intended as specification on how to install the Fully Adhered System. Reference to the manufacturer's application instructions is necessary to assure that the finished roof system is installed in compliance with manufacturer's requirements.
- B. Roofing contractor selected to bid project shall have installed a minimum 2,000 squares of Firestone EPDM in 2010 and must be a licensed applicator for a period of not less than five years. All Field seams shall be installed using seam tape as outlined in the application section. Splice adhesive is not permitted. **A TOTAL SYSTEM WARRANTY** is required on this project as outlined in the warranty section. Project includes but is not limited to removing existing roofing down to structural deck, replacing any deteriorated decking on a per square foot basis and supplying a fully adhered .060 mil EPDM roofing membrane over a 1/4" per foot slope Tapered insulation system (one and a half (1.5) inch minimum base layer).

3.2. SUBMITTALS

A. Submit Request For Inspection:

After completion of the roof system, submit to manufacturer the Request for Inspection and Approved Roof Drawing showing all pertinent information including location of splices, penetrations, dimensions, building height and edge conditions. An inspection will be subsequently scheduled (if a system warranty is requested) and completed by a field technician to determine compliance with specifications and details. Areas found not to be in conformance will be documented by the field technician and must be corrected by the applicator to meet specifications and details.

B. Submit Completed Repairs For Warranty:

Upon completion of repairs, sign and submit to manufacturer the Completed Repairs for Warranty form within 10 days of inspection.

3.3. JOB SITE CONSIDERATIONS (CAUTIONS AND WARNINGS)

- A. Keep all adhesives, sealants, primers and cleaning materials (e.g., gas, heptane, etc.) away from **ALL** ignition sources (i.e., torches, flames, fire, sparks, etc.).
- B. Consult container labels and Material Safety Data Sheets (MSDS) for specific safety instructions.
- C. All bonding, splicing, and sealing surfaces must be free of dirt, moisture, and any other contaminants.
- D. When the outside temperature is below 50°F, installation of the Adhered System requires some additional precautions:
1. Splice Adhesive consistency will become progressively thicker as the temperature drops. As a result, the desired smooth glossy adhesive surface will not be achievable unless the following precautions for cold weather splicing are followed:
 - a. Start work with sealants and adhesives at room temperature (60°F - 80°F). Insulated, heated boxes may be advantageous.
 - b. Complete a test splice to determine the adhesive flash off time.
 - c. Stop the splicing operation or change cans when the adhesive becomes too thick.
 - d. Certain combinations of temperature and humidity may cause condensation on the surface of the splice adhesive. If this condition occurs, flash the splice with flashing when the ambient air-conditions no longer cause condensation.
 2. Use maximum 10' wide panels during cold weather installations.
 3. Do not use heat guns or open flames in splicing procedures.
 4. Certain combinations of temperature and humidity may cause condensation on the surface of Bonding Adhesive. If this condition occurs, do not mate the surfaces. When the ambient air-conditions no longer cause condensation, apply additional Bonding Adhesive and proceed.
 5. Take care not to damage flashing when using heat guns.

- E. Do not use open flame sources (i.e., propane torches, etc.) to expedite drying of adhesives, sealants, etc., allowing to air dry only.
- F. Do not alter materials.
- G. Deliver materials to job site in their original containers as labeled by the manufacturer.
- H. Follow manufacturer's directions for protection of materials prior to, and during, installation. Do not use materials, which have been damaged.
- I. Care should be used when installing fasteners to avoid penetration of conduits and other piping in and under the deck.
- J. Fumes from adhesive solvents may be drawn into the building during installation through rooftop intakes. Appropriate measures must be taken to assure that fumes from adhesive solvents are not drawn into the building through air intakes.
- K. Insulation's are typically combustible and may constitute a fire hazard if improperly stored or installed. Do not expose to flame or other ignition sources.

3.4. ROOF SUBSTRATE PREPARATION

A. Correct Substrate Defects:

1. Bring defects to the attention of The Avrie Group, Inc., in writing, to be corrected before work commences.
2. Remove existing roof system components as specified. If detrimental components are discovered during installation, they should be brought to the attention of The Avrie Group, Inc. project manager for corrective action under provisions for unanticipated additional work.

B. Project Layout:

The EPDM System shall be installed in a fashion so that field and flashing splices are installed to shed water (shingle type fashion).

C. Remove Moisture:

Ponded water, snow, frost and/or ice, present in more than trace amounts on the deck or existing roof system, must be removed from the work surface prior to installing the Roof System.

D. Prepare Final Surface:

Acceptable substrates to which the Roof System is installed must be properly prepared prior to membrane installation. The surface must be clean, dry, smooth, and free of sharp edges, fins, loose or foreign materials, oil, grease and other materials, which may damage the membrane. All roughened surfaces, which could cause damage, shall be properly isolated from the membrane.

E. Fill Voids:

All surface voids of the immediate substrate greater than 1/4" wide must be properly filled with an acceptable insulation or suitable fill material.

3.5. WOOD NAILER LOCATION AND INSTALLATION

- A. Wood nailers shall be installed as specified.
- B. Wood nailers must be pressure treated (i.e. "Wolmanized" or "Osmostone K-33").

- 1. Position Wood Nailer:

Total wood nailer height shall match the total thickness of insulation being used and shall be installed with a 1/8" gap between each length and at each change of direction.

- 2. Secure Wood Nailer:

Wood nailers shall be firmly fastened to the deck. Mechanically fasten wood nailers to resist a force of 200 lbs. per lineal foot. Refer to attachment requirements as specified by the project designer.

- 3. Taper Wood Nailer:

The wood nailer shall be tapered so that it will always be flush at the point of contact with the insulation.

- 4. Chemical Treating of Wood Nailer:

Chemical treating for fire resistance or other purposes (other than pressure treating for rot resistance, i.e., "Wolmanized" or "Osmostone K-33") may affect the performance of the Firestone membrane and accessories. Consult manufacturer's Technical Services Department regarding compatibility.

- 5. Work by Others:

Make these specifications and details available when nailers are to be installed by others. Work, which compromises the integrity of the system, may jeopardize the warranty for the project.

3.6. MEMBRANE PLACEMENT

- A. Place Membrane and Allow to relax:

- 1. Place membrane panel, without stretching, over the acceptable substrate and allow relaxing for a minimum of 30 minutes before applying bonding adhesive. During cold weather application, it is recommended that only standard ten-foot wide panels be used. (Larger panels have factory folds, which do not relax during cold weather, which in turn make it difficult for proper application).

- B. Fold the Membrane Back:

- 1. After making sure the sheet is placed in its final position, fold it back evenly onto itself so as to expose the underside. (Note: The sheet fold should lay smooth so as to minimize the formation of wrinkles during and after installation.)

- C. Remove Dust and Dirt:

- 1. Sweep the mating surface of the membrane with a stiff broom to remove excess dusting agent (if any) or other contaminants from the mating surface.

D. Apply the Bonding Adhesive:

Apply Bonding Adhesive at about the same time to both the exposed underside of the sheet and the substrate to which it will be adhered so as to allow approximately the same drying time. Apply Bonding Adhesive so to provide an even and uniform film thickness.

1. Apply Bonding Adhesive with a roller:
 - a. Apply Bonding Adhesive and roll the adhesive on to the mating surfaces.
2. Apply Bonding Adhesive by spraying and then rolling:
 - a. Spray on Bonding Adhesive and then roll out with a solvent resistant paint roller.

E. Stop Bonding Adhesives short of splice Area:

1. Care must be taken not to apply Bonding Adhesive over an area that is to be later cleaned and spliced to another sheet or flashing.

F. Apply Bonding Adhesive at specified coverage rate:

1. Refer to container label and Technical Information Sheet for specific application requirements.

G. Test Bonding Adhesive for Readiness:

1. Allow 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.

H. Bond the Membrane to the Substrate:

1. Starting at the fold, roll the previously coated portion of the sheet into the coated substrate slowly and evenly so as to minimize wrinkles.

I. Broom the Membrane:

1. To ensure proper contact, compress the bonded half of the sheet to the substrate with a stiff push broom.

J. Repeat Procedure to Complete the Sheet Installation:

1. Fold the unadhered half of the membrane sheet back onto itself, and repeat the bonding procedure to complete the bonding of the sheet.

3.7. MEMBRANE LAP SPLICING

A. Using **Seam Tape**:

1. Splice Tape is designed for use on field splices only. The three-inch splice tape shall not be used in flashing details.

- a. Position and Fold Back the Lap Edge:
 - 1) Position the sheet at the splice area by overlapping membrane five inches. Once the membrane is in place, mark the bottom sheet 1/2" to 3/4" from the edge of the top sheet every four to six feet with a lumber crayon or similar type marking device. Tack the sheet back with primer at five foot centers and at factory splices or as necessary to hold back the membrane at the splicing area.
- b. Apply Primer to Splice Area:
 - 1) Remove excess amounts of dusting agent on the sheet and at factory splices using a stiff push broom. Stir primer thoroughly before and during use. Dip the scrubber into the bucket of primer, keeping the scrubber flat. Apply the primer using long back and forth type strokes with pressure along the length of the splicing area until surfaces become a dark gray in color. Apply primer to both surfaces at the same time to allow the same flash off time. Change the scrub pad each 200 feet of three (3) inch field splice, or when the pad will no longer hold the proper amount of primer. Additional scrubbing is required at areas that may have become contaminated or have excess amounts of dusting agent, and at all factory splices.
- c. Apply the SeamTape:
 - 1) Position the splice tape (with paper intact) on the bottom sheet, aligning the edge of the release paper with the markings. Immediately roll the splice tape with a three-inch to four-inch wide silicone or silicone sleeved steel hand roller or a short nap three-inch paint roller.
- d. Check the Seam Tape Alignment:
 - 1) When the splice tape has been installed for the entire splice length allows the top sheet to rest on top of the tape's paper backing. Trim the top sheet as necessary to assure that 1/8"to1/2" of the splice tape will be exposed on the finished splice.
- e. Remove Paper Backing:
 - 1) To remove the paper backing from the tape, first roll back the EPDM sheet, and then peel the paper backing off the splice tape by pulling against the weight of the bottom sheet at approximately a 45-degree angle to the tape and parallel with the roof surface. Allow the top sheet to fall freely onto the exposed splice tape. Broom the entire length of the splice as the release paper is being removed.
- f. Roll the Splice:
 - 1) Roll the splice using a one and one half inch to two-inch wide silicone or silicone sleeved steel hand roller, first across the splice, and then along the entire length of the splice.
- g) Special Considerations (End Laps, "T" Joints, etc.):
 - 1) End Laps:
 - a) When the splice is greater in length than the tape, the adjoining splice tape must be overlapped a minimum of one inch.
 - 2) Trim splice tape at "T" Joints:

- a) Trim splice tape so that the edge of splice tape and the edge of the membrane are flush beneath the "T" Joint area.
- 3) "T" Joints:
 - a) Apply a section of flashing or joint cover over the "T" joint area.
- 4) Using splice tape With Cured EPDM as Flashing:
 - a) If cured EPDM is used as flashing, apply an eight-inch long section of flashing or joint cover over the intersection of the flashing and field splice intersection.
 - b) All splice tape products may be used with reinforced membrane.

3.8. MEMBRANE SECUREMENT (BASE TIE-IN) LOCATION AND INSTALLATION

- A. Provide Membrane Securement:
 - 1. Secure membrane at all locations where the membrane terminates or goes through an angle change greater than two inches in twelve inches (i.e. roof edges, curbs, interior walls, etc.), except for round pipe penetrations less than eighteen inches in diameter and square penetrations less than four inches square.
- B. Install Reinforced Perimeter Fastening Strip or Batten Strips into the Structural Substrate or Wood Nailer:
 - 1. Mechanically fasten Reinforced Perimeter Fastening Strips with Firestone fasteners and two inch Seam Plates in accordance with manufacturer's details and specifications.
 - 2. Mechanically fasten Batten Strips with fasteners, in accordance with manufacturers recommended details.
 - 3. Adhere to the manufacturers recommendations to determine the applicable fastener and the associated penetration requirements for the specific substrate conditions.

3.9. 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 Pre-Molded EPDM Pipe Flashings where practical. **DO NOT CUT AND PATCH MOLDED EPDM PIPE FLASHINGS.**
 - 2. Flash using flashing material when Pre-Molded EPDM Pipe Flashing is not practical.
 - 3. Refer to manufacturer's technical information sheet for minimum and maximum pipe diameters that can be successfully flashed with Pre-Molded EPDM Pipe Flashings.

C. Structural Steel Tubing:

1. Use a field fabricated pipe-flashing detail provided that the minimum corner radius is greater than 1/4" and the longest side of the tube does not exceed 12". When the tube exceeds 12", use a standard curb detail.

D. Roof Drains:

1. These specifications apply for installation of cast iron drains only. For all other drain types contact the project manager.
 - a. Remove all existing flashings (including lead flashings), roofing materials and cement from the existing drain in preparation for membrane and Water Block Seal.
 - b. Provide a clean even finish on the mating surfaces between the clamping ring and the drain bowl.
 - c. Taper insulation around the drain to provide a smooth transition from the roof surface to the drain. Use pre-manufactured tapered insulation (with facer or suitable bonding surface) to achieve slope. Slope shall not exceed four inches per foot with non-reinforced membrane and one inch per foot with reinforced membrane.
 - d. Position the EPDM membrane, and then cut a hole for the roof drain to allow 1/2" to 3/4" of membrane extending inside the clamping ring past the drain bolts.
 - e. Make round holes in the EPDM membrane to align with clamping bolts (a paper punch may be used). Do not cut the membrane back to the boltholes.
 - f. Place Water Block Seal on top of drain bowl where the clamping ring seats below the membrane (use a minimum of one half of a 10 oz. tube for a 10 inch drain).
 - g. Install the roof drain clamping ring and clamping bolts. Tighten the clamping bolts to achieve constant compression.

E. Pipe Clusters and Unusual Shaped Penetrations:

1. Fabricate penetration pockets to allow a minimum clearance of one inch between the penetration(s) and all sides.
2. Secure penetration pockets as shown in details.
3. Fill penetration pockets with Pourable Sealer, so as to shed water. Pourable Sealer shall be a minimum of two inches deep.

3.10. FLASHING - WALLS, PARAPETS, MECHANICAL EQUIPMENT CURBS, ETC.

A. General:

1. Using the longest pieces practical, flash all walls, parapets, curbs, etc., to the height as specified by the project designer.

B. Substrate:

1. The following substrates require an overlayment of 5/8" exterior grade or pressure treated plywood mechanically fastened in accordance with The Avrie Group, Inc. requirements.
 - a. Gypsum board
 - b. Textured masonry
 - c. Corrugated metal panels
 - d. Other uneven substrates

C. Existing Flashings:

1. Remove loose or unsecured flashings.
2. Remove mineral surfaced or coated flashings.
3. Remove excessive asphalt to provide a smooth, sound surface for new flashings.

D. Splice to Roof Sheet First:

1. Complete the splice between flashing and the main roof sheet with Splice Adhesive before adhering flashing to the vertical surface. Provide lap splices in accordance with details.

E. Apply Bonding Adhesive to the Vertical Surface:

1. Apply Bonding Adhesive at about the same time to both the flashing and the surface to which it is being bonded so as to allow approximately the same flash off time. Apply Bonding Adhesive evenly to avoid globs.

a. Apply Bonding Adhesive with a Roller:

1. Apply Bonding Adhesive and roll the adhesive onto the mating surfaces.

a. Apply Bonding Adhesive by Spraying and then Rolling:

1. Spray on Bonding Adhesive and then roll out with a solvent resistant paint roller.

F. Apply Bonding Adhesive at Specified Coverage Rate:

1. Apply Bonding Adhesive as specified in the Adhered Application Specification. Note: Coverage rate will differ with various substrates and/or climatic conditions.

G. Test Bonding Adhesive for Readiness:

1. Allow 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.

H. Roll flashing up the Vertical:

1. Roll the flashing into the adhesive evenly and carefully so as to minimize wrinkles. After rolling flashing (when used), peel off the release sheet and discard. Flashing must be contoured to fit the substrate to which it is bonded to minimize bridging or gapping. Use a silicone or silicone sleeved steel roller for rolling in flashing.

I. Broom the Flashing:

1. To ensure proper contact, compress the flashing to the substrate with a stiff push broom.

J. Provide Termination:

1. Provide termination directly to the vertical substrate as shown in details.

K. Install T-Joint Covers at Field and Flashing Splice Intersections:

1. Where a flashing splice crosses a field splice, install a joint cover, a six-inch length of flashing, or a six-inch by six-inch section of flashing.

<u>Wall Height</u>	<u>Intermediate attachment requirements</u>
Up to 5 feet	none
5 feet - 10 feet	One attachment at 1/2 the wall height
Above 10 feet	One attachment every 36 inches

2. Intermediate attachment is not required under the following conditions regardless of wall height:
 - a. The wall surface is smooth without noticeable high spots or depressions (i.e. plywood poured or pre-cast concrete or hollow core block or masonry walls where mortar joints are flush with the masonry surface).

3.12. FLASHING - ROOF EDGE METAL

A. Using EPDM Flashing:

Flash gravel stops or roof edge metals using flashing as follows:

1. Clean the Membrane and Metal Edge:

Remove excess amounts of dusting agent by brooming. Apply primer to the metal edging and membrane as described in scope of work. Allow the primer to flash off.

2. Apply Flashing:

Place the roll of flashing on the roof a few feet ahead of the application starting point, positioned so that it unrolls from the top of the roll (release paper will be on top). Remove approximately two feet to three feet of release paper and apply to the metal flange and EPDM Membrane. Lap adjacent rolls of flashing a minimum of one inch.

3. Roll the Flashing:

With a two-inch to three-inch wide silicone or silicone sleeved steel hand roller, roll the flashing to ensure proper adhesion. Additional attention must be given to factory splice intersections and to any change in plane.

4. Special Considerations (End Laps, "T" Joints, etc.):

- a. Apply six inch length of flashing, a joint cover, or six inch by six inch flashing to the inside edge of the flashing at all overlaps.
- b. Apply six inch length of flashing, a joint cover, or six inch by six inch flashing at all intersections between the flashing and field fabricated splices.
- c. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, an additional piece of flashing shall be applied over the metal lap to the top of the gravel stop, after the initial application of flashing. Seam Edge Treatment shall be applied at the intersections of the two flashing sections.

3.13. MEMBRANE REPAIR

A. Repair Cuts/Punctures in the Membrane, or Wrinkles within 18" of a Splice:

1. A wrinkle running toward a splice or within 18" of a splice must be repaired. The wrinkle must be cut out and patched with a section of EPDM membrane having no factory splices. Provide a splice that extends a minimum of three inches beyond the boundaries of the cut in all directions. If the wrinkle occurs through flashing, then flashing shall be used for repair, however, flashing may not extend onto the roof surface more than six inches. If repairing of the same wrinkle must continue, then EPDM membrane must be used. Install the EPDM repair membrane first, rounding all corners of the repair piece.
2. Repair a cut or puncture in the EPDM membrane with EPDM membrane. The repair must extend a minimum of three inches beyond the boundary of the affected area in all directions. Round all corners of the repair piece (Example: A pinhole will require a minimum six inches by six inches EPDM section).

B. Clean the Membrane:

When repairing membrane, which has been in service for some time, it is necessary to remove accumulated dirt. First scrubbing the membrane with a scrub brush and warm soapy water, then rinsing with clear water and drying with clean cotton cloths make proper membrane preparation. Clean the area using clean cotton cloths with splice wash. Additional cleaning using cleaner is often necessary.

C. Install Splice:

Repairs must be made with splice adhesive.

3.14. TEMPORARY CLOSURE

- A. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the licensed applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.

3.15. ROOF WALKWAYS

A. Lay Out Walkway Pads:

1. Install walkway pads in locations as specified by The Avrie Group, Inc. (entrance of roof to all HVAC equipment), in accordance with manufacturer's requirements. Layout walkway pads so that the flat surface is over the completed EPDM membrane, spacing each pad a minimum of one inch and a maximum of three inches from each other to allow for drainage.
2. If the installation of walkway pads over field fabricated splices or within six inches of a splice edge cannot be avoided, flash in the splice using flashing. The flashing shall extend beyond the walkway pad a minimum of six inches on either side.

B. Attach Walkway Pads to the Membrane:

1. Clean the Mating Surfaces:

- a. Clean the mating surfaces of the walkway pad and the membrane using primer.

2. Apply Three (3) Splice Tape Sections:

- a. Apply three parallel, full-length, sections of splice tape. Place two lengths of the tape approximately flush with two edges and the third approximately down the middle of the pad.

3. Place Walkpad:

- a. Remove the release paper. Turn the walkpad over and place it in the appropriate primer.

4. Apply Pressure:

- a. Walk on the pad to press in place assuring proper adhesion.

3.16. PRODUCTS SUPPLIED BY MANUFACTURER

A. Roofing Membrane - Fully Adhered Construction

1. Roofing membrane to be nominal 60-mil, reinforced, EPDM sheet membrane.

B. Insulation System

1. Roof Insulation to be minimum 1.5" thick Polyisocyanurate.
2. Tapered Insulation: ¼ "slope.
 - a. Polyiso.

3.17. SHEET METAL WORK

- A. High performance roof edge system shall be CERTIFIED by the manufacturer to comply with ANSI/SPRI Standard ES-1. Roof edge shall meet performance design criteria according to the following test standards:

ANSI/SPRI ES-1 Test Method RE-1 Test for Roof Edge Termination of Single-Ply Roofing Membranes: The fascia system shall be tested to secure the membrane to minimum of 100 lbs/ft in accord with the ANSI/SPRI ES-1 Test Method RE-1. Use the current edition of ANSI/SPRI ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

ANSI/SPRI ES-1 Test Method RE-2 Pull-Off Test for Fascia: The fascia system shall be tested in accord with the ANSI/SPRI ES-1 Test Method RE-2. Use the current edition of ANSI/SPRI ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

- B. The fascia product shall be listed in current Factory Mutual Research Corporation Approval Guide approved for [FM-1-645].
- C. The fascia product shall be approved for use in Miami-Dade County and has been designed to comply with Florida Building Code, including the High Velocity Hurricane Zone. Miami-Dade County NOA No. 03-0108.06 Expiration Date 12/11/08

3.18. MANUFACTURER'S FIELD SERVICE

- A. Upon completion of the roof system, an authorized manufacturer's representative will make an inspection of the installation for final acceptance.

3.19. CLEAN UP

- A. The Contractor shall clear the construction areas and shall provide for the removal from the building site of all his construction debris.
- B. All debris shall be removed from the premises promptly and the construction area shall be left clean daily.

* * END OF SECTION * * *

JOINT SEALERS/CAULKING

1. PART 1 - GENERAL

1.1. DESCRIPTION OF WORK

- A. Extent of each form and type of joint sealer is indicated on drawings and by provisions of this section.
- B. The applications for joint sealers as work of this section include the following:
 - 1. Removal of old sealant and all existing material at all coping stone locations.
 - 2. Proper preparation of all surfaces to receive new material.
 - 3. Wall joints (exterior) on or above roof work levels as defined and detailed on drawings.
 - 4. Flashing and coping joints on roof work areas as defined and detailed on drawings.

1.2. SYSTEM PERFORMANCES

- A. Provide joint sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.

1.3. INSPECTION

- A. Verify installation conditions as satisfactory to receive work.
- B. Do not install new sealants until all unsatisfactory conditions are corrected. **Beginning work constitutes acceptance of conditions.**

1.4. SCHEDULE

- A. Installation of the new roofing system should be scheduled after all other major rooftop construction is complete to minimize potential for damage to the new roofing system by others.

1.5. QUALITY ASSURANCE

- A. Installer Qualifications: Engage an installer who has successfully completed, within the last three years, at least three joint sealer applications similar in type and size to that of this project and who will assign mechanics from these earlier applications to this project, of which one will serve as lead mechanic.

- B. Single Source Responsibility for Joint Sealer Materials: Obtain joint sealer materials from a single manufacturer for each different product required.

1.6. SUBMITTALS

- A. Related Section: *SUBMITTALS*
- B. Prior to starting work, the roofing contractor shall submit three copies of the manufacturer's technical data, including material specification and installation procedures. Technical data shall include flammability, toxicity, and carcinogenic characteristics (if any) of all materials.
MATERIAL SAFETY DATA SHEETS.

1.7. JOB CONDITIONS

- A. Sealant work shall proceed only when weather conditions will permit the work to proceed in accordance with the material manufacturer's recommendations.

1.8. PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealers under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturers.
 - 2. When joint substrates are wet due to rain, frost, and condensation or other causes.
- B. Joint Width Conditions: Do not proceed with installation of joint sealers when joint widths are less than allowed by joint sealer manufacturer for application indicated.

1.9. ADJUSTMENT AND REPAIR

- A. Any sealants damaged or misapplied shall be repaired or replaced as required by the contract, at no expense to building owner.

1.10. WARRANTY

- A. Related Section: *WARRANTIES*
- B. Upon project completion and acceptance by building owner a minimum ten year limited warranty will be issued by the Sealant Manufacturer.

2. PART 2 - PRODUCTS

2.1. GENERAL

- A. Comply with quality control, references, specification, and manufacturer's data. Where conflict may exist, more stringent requirements govern.
- B. Compatibility: Provide joint sealers, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.
- C. Colors: Provide color of exposed joint sealers indicated or, if not otherwise indicated, as selected by the owner from manufacturer's standard colors.

- D. General Sealer Performance Requirements: Provide colors, as selected by the owner from the manufacturer's standard colors. Select materials for compatibility with joint surfaces and other indicated exposures, and except as otherwise indicated, select modulus of elasticity and hardness or grade recommended by manufacturer for each application indicated. Where exposure to foot traffic is applicable, select marketing materials of sufficient strength and hardness to withstand stiletto heel traffic without damage or deterioration of sealer system.

2.2. ELASTOMERIC SEALANTS

- A. Two part, non-sag, low modulus, polyurethane joint sealant FS TT-S-00230C, Type II, Class A and ASTM-C-920-79, Type S, Grade NS, Class 25.

2.3. MISCELLANEOUS MATERIALS

- A. Joint Cleaner: Provide type of joint cleaner compound recommended by sealant or caulking compound manufacturer, for joint surfaces to be cleaned.
- B. Joint Primer/Sealer: Provide type of joint primer/sealer recommended by sealant manufacturer for joint surfaces to be primed and sealed.
- C. Bond Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer to be applied to sealant-contact surfaces where bond to substrate or joint filler shall be avoided for proper performance of sealant. Provide self-adhesive tape where applicable.
- D. Sealant Backer Rod: Compressible rod stock of polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam, or other flexible, permanent, durable non-absorptive material as recommended by the sealant manufacturer.

2.4. JOINT SEALANT BACKING

- A. General: Provide sealant backing of material and type which are non-staining, are compatible with joint substrates, sealants, primers, and other joint fillers, and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Plastic Foam Backer Rods: Preformed compressible, resilient, non-waxing, non-extruding strips of plastic foam of material indicated below, and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - 1. Closed-cell polyurethane foam, flexible.
- C. Bond-Breaker Tape

2.5. MISCELLANEOUS MATERIALS

- A. Primer: Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from pre-construction joint sealer-substrate and field tests.

- B. Cleaners for Non-Porous Surfaces: Provide non-staining chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials that are not harmful to substrates and adjacent non-porous materials.
- C. Masking Tape: Provide non-staining, non-absorbent type compatible with joint sealants and to surfaces adjacent to joints.

3. PART 3 - EXECUTION

3.1. MANUFACTURER'S INSTRUCTIONS

- A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified and except where manufacturer's technical representative directs otherwise.

3.2. JOINT PREPARATION

- A. Clean joint surfaces immediately before installation of sealant or caulking compound. Remove dirt, insecure coatings, moisture, and other substances, which could interfere with bond of sealant or caulking compound on each concrete and masonry joint surface as recommended by the manufacturer. Roughen vitreous surfaces and glazed joint surfaces as recommended by sealant manufacturer.
- B. Prime or seal joint surfaces where indicated and where recommended by sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.

3.3. INSTALLATION

- A. Set joint filler units at proper depth or position in joint to coordinate with other work, including installation of bond breakers, backer rods, and sealants. Do not leave voids or gaps between ends of joint filler units.
- B. Install sealant backer rod for liquid elastomeric sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for application indicated.
- C. Install bond breaker tape where indicated and where required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.
- D. Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbit to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove so that joint will not trap moisture and dirt.
- E. Install sealant to depths shown or, if not shown, as recommended by sealant manufacturer, but within the following general limitations, measured at center (thin) section of bead.
 - 1. For normal moving joints sealed with elastomeric sealants but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.
 - 2. For joints sealed with non-elastomeric sealants and caulking compounds, fill joints to a depth in range of 75% to 125% of joint width.
- F. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.

3.4. CURE AND PROTECTION

- A. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength, and surface durability. Advise contractor of procedures required for cure and protection of joint sealers during construction period so that they will be without deterioration or damage (other than normal wear and weathering) at time of substantial completion.

* * * END OF SECTION * * *

SHEET METAL/FLASHING

1. PART 1 — GENERAL

1.1. RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other sections of these Specifications.

1.2. GENERAL

- A. This portion of the specification sets forth the general requirements and describes materials and workmanship for installing the flashings and sheet metal for the EPDM roof system.
- B. All materials described herein shall be furnished and installed by the roofing contractor unless specifically noted otherwise.
- C. This section is for work on all roofs listed.
- D. 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. PART 2 — PRODUCTS

2.1. MECHANICAL FASTENERS

- A. Sheet Metal to Masonry:
 - 1. Tapcon 1/4-inch diameter, Phillips flat head anchor with EPDM washer by Buildex Div. of ITW, Itasca, IL.
 - 2. Zamac Nailin with stainless steel nail by Rawlplug Co., Inc., New Rochelle, NY.
 - 3. Length: Sufficient to provide 1-1/4 inch embedment.
- B. Sheet Metal to Curbs:
 - 1. Fab-lok Fac 10-8 stainless steel screw, aluminum sleeve by Fabco Fastening Systems, Newton, PA.
- C. Stainless Sheet Steel to Wood Blocking:
 - 1. FS-N-105B (3) Type II, Style 20, and Roofing Nails: Galvanized steel wire, flat head, diamond point, round, barbed shank.
 - 2. Length: Sufficient to penetrate wood blocking 1-1/4 inches minimum.
- D. Galvanized Sheet Steel to Wood Blocking:
 - 1. FS-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. Base Flashing to Masonry:
1. Masonry nails by Simplex Nail, Inc., Americus, GA.
 2. Round Cap Masonry Nail by Hillwood Mfg. Co., Cleveland, OH.

2.2. METAL FLASHING

- A. **Termination bar shall be installed under ALL required NEW counter flashing:** ASTM B221-83, 1/8 x 1 inch, aluminum bar, and alloy 6063-T6.
- B. Metal Cleaner: Xylol or MEK.
- C. Metal Primer: Generic asphalt.
- D. Misc. Components: Shop fabricated, 24 gauge, galvanized, pre-finished, Kynar 500 coated metal components including; counter flashing, storm collars, area divider covers, expansion joint covers, etc.
- E. Plumbing Vents and Drains: ASTM B29, four (4) lbs. sheet lead.
- F. Pourable pitch pocket sealer: Generic.
- G. Gravel stop and coping: Shop fabricated, 24 gauge, galvanized, pre-finished, Kynar 500 coated.

* * END OF SECTION * * *



