

May 24, 2019

ADDENDUM ACKNOWLEDGEMENT FORM

To Whom It May Concern:

Concerning the **PSJA ISD CARNAHAN, FRANKLIN, AND BUELL CENTRAL HVAC ADDITIONS TO GYMS BID # 18-19-052**, to be opened at 4:00 p.m., Thursday, May 30, 2019. Please consider the following:

Addendum Number:	Description of REVISED Addendum:
3	QUESTIONS / ANSWERS REQUEST FOR SUBSTITUTION / ADDITION / CLARIFICATION ATTACHMENTS / DRAWINGS

For any questions pertaining to these changes, please contact Emily Garza, Director of Purchasing at (956) 354-2000.

Sincerely,



Emily Garza
Director of Purchasing

With the acceptance of this form, I acknowledge that I have received the above ***"ADDENDUM ACKNOWLEDGEMENT FORM"*** for the **PSJA ISD CARNAHAN, FRANKLIN, AND BUELL CENTRAL HVAC ADDITIONS TO GYMS # 18-19-052**, to be opened at 4:00 p.m., Thursday, May 30, 2019. Please include a signed copy of this ***"ADDENDUM ACKNOWLEDGMENT FORM"*** with your bid/proposal.

Company Name: _____ Authorized Signature: _____

Address: _____ Authorized Signature
(Print): _____

City / State / Zip: _____ Email: _____

Telephone Number: _____ Fax Number: _____

START COLLEGE NOW! COMPLETE EARLY! GO FAR!

Date: May 24, 2019

PROJECT: P S J A I. S. D.
Carnahan, Franklin & Buell
HVAC Additions to Gyms
Bid # 18-19-052

ARCHITECT: EGV Architects, Inc.
220 S. Bridge
Hidalgo, TX 78557
(956) 843-2987



This addendum applies to work designated herein, shall be understood to be and as such shall be part and is included in the contract.

ITEM #1 Questions / Requests for Substitutions

- Refer to attached questions and answers page labeled **ATTACHMENT #1** (1 page).

ITEM #2 Addition, Specifications Section 07213 Pre-Engineered Building Liner System

- Insert herein attached specifications section 07213 Pre-Engineered Building Liner System labeled **ATTACHMENT #2** (4 pages) after section 07210. This is to be installed at the three gyms.
- Install liner fabric on existing metal roof purlins with straps and fasteners as recommended by manufacturer. Liner shall cover all of the existing gym ceiling area at all three gyms.
- GC to coordinate installation with other trades (i.e. existing electrical and new ductwork installation)

ITEM #3 Addition, Specifications Section 07535 Fully Adhered Multi-Ply Roof System

- This roofing system to be applied at low sloped areas of gym's restroom & offices as per roof plan at Carnahan gym only.
- Insert herein attached specification Section 07535 Fully Adhered Multi-Ply Roof System labeled **ATTACHMENT #3** (23 pages) after section 07411.

ITEM #4 Addition, Specifications Section 09056 Moisture Vapor Emission Control

- Add Koster VAP I 2000 Ultra Fast Set by Koster USA as an acceptable product for the moisture vapor emission control.
- Flooring Contractor to provide turn-key project along with the moisture vapor emission control product.
- Warranty shall match that of the product specified.

ITEM #5 Clarification, Drawings, Sheet AB1.0

- Existing light fixtures to be removed and replace at existing location as per Addendum #1, Attachment #7.

ITEM #6 Clarification, Drawings, Sheet AH1.0 (RISER ROOM H101)

- New ceiling height to be at 9'-0"
- Proposed North and west CMU walls to be installed up to deck (approx. 11'-8" high). Seal top of new walls with fire safing insulation.

NOTIFICATION: It is the responsibility of the General Contractor to notify all of his subcontractors of the contents of all addenda.

ITEM #7 Clarification, Drawings, Sheet AH1.1 (Detail #1)

- Refer to attached drawing labeled **ATTACHMENT #4** (1 sheets) for updated roof detail markers and notes.

ITEM #8 Addition, Drawings, Sheet AH1.1 (Detail #9)

- Refer to attached drawing labeled **ATTACHMENT #5** (1 sheets) for existing roof plan and notes.

P S J A I. S. D.

Carnahan, Franklin & Buell HVAC Additions to Gym

Bid # 18-19-052

Electronic Bids due on May 30, 2019, at 4:00 pm

QUESTIONS / REQUEST FOR SUBSTITUTIONS

1. Question: I would like to submit this substitution request for the Moisture Vapor Emission Control (section 09056). We use Koster for our moisture control and the leveling is done with the polyurethane that is in our flooring. Koster is willing to match the warranty offered by MAPEI.
 - Add Koster VAP I 2000 Ultra Fast Set to the list of acceptable manufacturers for the moisture vapor emission control at Carnahan gym floor.

DIVISION 7 THERMAL & MOISTURE PROTECTION
07213 PRE-ENGINEERED BUILDING LINER SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pre-Engineered Building Liner System for Existing Construction.

1.2 RELATED SECTIONS

- A. Division 15 - Mechanical; Rough-in utilities.
- B. Division 16 - Electrical; Rough-in utilities.
- C. Section 16900 - Fire Protection Systems.

1.3 REFERENCES

- A. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM E 96 - Standard Test Method for Water Vapor Transmission of Materials in Sheet Form (Procedure B).
- C. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
- D. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.4 DESIGN REQUIREMENTS

- A. Thermal Resistance of Pre-Installed Roof System: R-Value of Zero.
- B. Liner system shall have a continuous perforated Syseal Liner Fabric inside of building purlins and girts.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. [\[Product Data\]](#): Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation instructions.
- C. Shop Drawings: Indicate locations of connections and attachments, general details, anchorages and method of anchorage and installation.
- D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square or long, representing actual products required for this project.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing product systems specified in this section with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in performing work of this section.
- C. Liner system components to include a ten-year limited material warranty.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products indoors and protect from moisture, construction traffic, and damage.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Thermal Design, Inc., Simple Saver System. P.O. Box 468, 601 N. Main Street, Madison, NE 68748. ASD. Tel: (800) 255-0776 or (402) 454-6591. Fax: (402) 454-2708. Email: sales@thermaldesign.com, www.thermaldesign.com.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01010, Items 1.18 and 1.29.

2.2 MATERIALS

- A. Simple Saver System consists of Perforated Liner Fabric, Straps, and other devices and components in a proprietary insulation system as follows:
 - 1. Liner Fabric: Syseal® type woven, reinforced, high-density polyethylene yarns coated on both sides with a continuous white or colored polyethylene coatings, as follows:
 - a. Product complies with ASTM C 1136, Types I through Type VI.
 - b. **Perforated according to manufacturer of Syseal Liner Fabric.**
 - c. Flame/Smoke Properties:
 - 1) 25/50 in accordance with ASTM E 84.
 - 2) Self-extinguishes with field test using matches or butane lighter.
 - d. Ultra violet radiation inhibitor to minimum UVMAX® rating of 8.
 - e. Size and seaming: Manufactured in large custom pieces by triple extrusion welding from roll goods, and fabricated to substantially fit defined building area with minimum practicable job site sealing.
 - f. Provide with factory triple, extrusion welded seams. Stapled seams or heat-melted seams are not acceptable due to degradation of fabric.
 - g. Factory-folded to allow for rapid installation.
 - h. Color:

- 1) White.
2. Vapor Barrier Lap Sealant: Solvent-based, Simple Saver polyethylene fabric adhesive.
3. Vapor Barrier Tape: Double-sided sealant tape 3/4 inch (19 mm) wide by 1/32 inch (.79 mm) thick.
4. Vapor Barrier Patch Tape: Single-sided, adhesive backed sealant tape 3 inches (76 mm) wide made from same material as Syseal® type liner fabric.
5. Straps:
 - a. 100 KSI minimum yield tempered, high-tensile-strength steel.
 - b. Size: Not less than 0.020 inch (0.50 mm) thick by 1 inch (25 mm) by continuous length.
 - c. Galvanized, primed, and painted to match specified finish color on the exposed side.
 - d. Color:
 - 1) White.
6. Fasteners:
 - a. For light gage steel: #12 by 3/4 (19 mm) inch plated Tek 2 type screws with sealing washer, painted to match specified color.
 - b. For heavy gage steel: #12 by 1-1/2 inch (38 mm) plated Tek 4 type screws with sealing washer, painted to match specified color.
 - c. For wood, concrete, other materials: As recommended by manufacturer.
7. Not used.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that building structure including all bracing and any concealed building systems are completed and approved prior to installing liner system in the structure.
- B. Correct any unsatisfactory conditions before proceeding.
- C. If conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 INSTALLATION - GENERAL

- A. Install pre-engineered building Liner system in accordance with manufacturer's installation instructions and the approved shop drawings.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 ROOF INSTALLATION

- A. Straps:
 1. Cut straps to length and install in the pattern and spacings indicated on shop drawings.
 2. Tension straps to required value.
- B. Syseal Liner Fabric:
 1. Install syseal liner fabric in large one-piece custom fabricated pieces to substantially fit defined building areas with minimum practicable job site sealing.

2. Position pre-folded fabric on the strap platform along one eave purlin.
 3. Clamp the two bottom corners at the eave and also centered on the bay.
 4. Pull the other end of the pleat-folded fabric across the building width on the strap platform, pausing only at the ridge to fasten the straps and fabric in position where plane of roof changes and to release temporary fasteners on the opposite ridge purlins.
 5. Once positioned, install fasteners from the bottom side at each strap/purlins intersection.
 6. Trim edges and seal along the rafters.
 7. All seams must be completely sealed and stapled seams not acceptable.
- C. Insulation:
1. No insulation to be installed.
- D. Seal Syseal Liner fabric to the wall fabric and elsewhere as required to provide a continuous Liner System.

3.4 WALL INSTALLATION

- A. Insulation:
1. No insulation to be installed.
- B. Syseal Liner Fabric:
1. Install syseal fabric in large one-piece custom fabricated pieces to substantially fit defined building areas with minimum practicable job site sealing.
 2. Apply the liner fabric by clamping it in position over eave strap and installing fasteners through the eave strap into each roof strap, permanently clamping the wall fabric between them.
 3. Once in position, draw the liner fabric down over the column flanges to the base angle and install vertical straps along each column and 5 feet 0 inches on center, maximum, fastening to each girt to retain system permanently in place.
 4. All seams must be completely sealed and stapled seams not acceptable.
- C. Seal wall fabric to the roof fabric, to the base angle and up the columns to provide a continuous Liner System.

3.5 CLEANING

- A. Clean dirt or exposed sealant from the exposed Syseal Liner fabric.
- B. Remove scraps and debris from the site.

3.6 PROTECTION

- A. Protect system products until completion of installation.
- B. Repair or replace damaged products before completion of Liner system installation.

3.7 SCHEDULE

- A. Ceiling Insulation general: NO Insulation, perforated Liner System only

END OF SECTION

DIVISION 7 THERMAL & MOISTURE PROTECTION
07535 FULLY ADHERED MULTI-PLY ROOF SYSTEM

PART 1 - GENERAL

1.01 AREAS COVERED

- A. Low slope roof areas as indicated on plans at Carnahan Elementary School Gym.

1.02 INSTALLER QUALIFICATIONS

- A. Roofing Installer must be:
 - 1. Currently prequalified with the Owner in accordance with Owner's prequalification requirements.
 - 2. Currently in good standing with the manufacturer.
- B. It shall remain each Contractor's responsibility to determine his current status with the manufacturer's certification plan.

1.03 QUALITY ASSURANCE

- A. Applicator/Installer:
 - 1. Acceptable to roof material manufacturer for the manufacturer's warranty requirements.
 - 2. Five (5) years successful experience on projects similar in size and scope.
 - 3. Experienced in the type of roofing work required.
 - 4. Successfully completed previous projects warranted by the manufacturer.
- B. Manufacturer Qualifications:
 - 1. A qualified manufacturer that has been UL Listed and has FM Approvals for membrane roofing system similar to that used in this project for a minimum of fifteen (15) years.
 - 2. The roofing membrane manufacturer is defined as a company which makes the primary roofing membrane and flashing membrane in its own factories from raw materials. No "Private Label" material, in which one company's name goes on a product manufactured by others is acceptable for this project.
- C. Manufacturer's Observation Reports: Beginning with the commencement of the roofing system installation for the project and continuing through the completion of the roofing system installation and all its associated components, the Roofing System Manufacturer or their appointed representative shall provide jobsite observations and written observation reports including digital photos as follows and this shall be confirmed in writing by the manufacturer and made part of the roofing submittals.
 - 1. Keep the Architect / Owner informed as to the progress, status, and quality of work as observed.
 - 2. Provide weekly jobsite observations no less than (2) hours per week throughout the installation of the roofing system and its associated components. Reports shall include detailed weekly reports to the Architect, Contractor, and Subcontractor along with digital photographs of work in progress. These reports and photographs shall be descriptive of actual work in progress, status, and

- condition, and be presented in a written format with digital color photographs.
3. Report to the Architect / Owner in writing any refusal or failure of the Contractor to correct installations, practices and/or conditions in conflict with the specifications and/or manufacturer's recommended guidelines called to the Contractor's attention.
4. It will be the sole responsibility of each bidder to ensure these conditions are to be met by the roofing system manufacturer and/or their appointed representative prior to bidding.
- D. Testing Laboratory Services: Test results shall meet or exceed established standards.
- E. Underwriters Laboratories, Inc.; Roofing Covering: Class A fire hazard classification.
- F. Comply with governing local, state, and federal regulations, safety standards, and codes.

1.04 REFERENCES (INCLUDING LATEST REVISIONS)

- A. American Society for Testing and Materials:
 1. ASTM B 209 Specification for Aluminum and Aluminum Alloy Sheet and Plate
 2. ASTM C 719 Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cycle Movement (Hockman Cycle)
 3. ASTM C 794 Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
 4. ASTM C 920 Specification for Elastomeric Joint Sealants
 5. ASTM D 312 Specification for Asphalt Used in Roofing
 6. ASTM D 1863 Specification for Mineral Aggregate Used on Built-up Roofs
 7. ASTM D 2178 Specification for Asphalt Glass Felt Used in Roofing and Waterproofing
 8. ASTM D 2824 Specification for Aluminum - Pigmented Asphalt Roof Coatings
 9. ASTM D 4586 Specification for Asphalt Roof Cement, Asbestos Free
 10. ASTM A 361 Sheet Steel, Zinc-Coated (Galv.) by the Hot-Dip Process for Roofing and Siding
 11. ASTM C 177 Test for Thermal Laboratory Services
 12. ASTM C 728 Perlite Thermal Insulation Board
- B. Federal Specifications:
 1. LLL-I-535B
 2. SS-A-701B
 3. SS-C-153
 4. SS-C-153C
 5. SS-R-620B
 6. TT-C-498C
 7. TT-P-320D
 8. TT-S-00227E
 9. TT-S-00230C
 10. SS-S-001534 (GSA-FSS)
 11. L-P-375
- C. Industry Standards:
 1. The National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual
 2. Single-ply Roofing Institute (SPRI) - A Professional Guide to Specifications

- Manual
- 3. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) - Architectural Sheet Metal Manual
- 4. American Society of Civil Engineers – ASCE 7

1.05 SUBMITTALS

- A. Samples and Manufacturer's Submittals: Submit prior to delivery or installation.
 - 1. Samples of all roofing system components including all specified accessories.
 - 2. Submit samples of proposed warranty complete with any addenda necessary to meet the warranty requirements as specified.
 - 3. Submit latest edition of manufacturer's specifications and installation procedures. Submit only those items applicable to this project.
 - 4. A written statement from the roofing materials manufacturer approving the installer, specifications and drawings as described and/or shown for this project and stating the intent to guarantee the completed project.
 - 5. Manufacturer's Equiviscous Temperatures (EVT) for the specified bitumens.
- B. Shop Drawings: Provide manufacturer's approved details of all perimeter conditions, projection conditions, and any additional special job conditions which require details other than indicated in the drawings. Shop drawings shall be engineered drawings, digital or CAD. Hand sketches, copies or tracings of projects documents are not acceptable. Manufacturer's details are acceptable provided they are job specific and representative of actual conditions.
- C. Maintenance Procedures: Within ten days of the date of Substantial Completion of the project, deliver to the Owner three copies of the manufacturer's printed instructions regarding care and maintenance of the roof.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened containers and rolls with all labels intact and legible including labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions. Materials damaged in shipping or storage shall not be used.
- B. Deliver materials requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.
- C. Deliver materials in sufficient quantity to allow continuity of work.
- D. Handle and store material and equipment in such a manner as to avoid damage. Liquid products shall be delivered sealed, in original containers.
- E. Handle rolled goods so as to prevent damage to edge or ends.
- F. Select and operate material handling equipment so as not to damage existing construction or applied roofing.

- G. Moisture-sensitive products shall be maintained in dry storage areas and properly covered. Provide continuous protection of materials against wetting and moisture absorption. Store roofing and flashing materials on clean raised platforms with weather protective covering when stored outdoors.
- H. Store rolled goods on end.
- I. Protect materials against damage by construction traffic.
- J. The proper storage of materials is the sole responsibility of the contractor and any wet or damaged roofing materials shall be discarded, removed from the project site, and replaced prior to application.
- K. Comply with fire and safety regulations, especially with materials which are extremely flammable and/or toxic. Use safety precautions indicated on labels.
- L. Products liable, such as emulsions, to degrade as a result of being frozen shall be maintained above 40° F in heated storage.
- M. No storage of materials shall be permitted on roof areas other than those materials that are to be installed the same day.

1.07 SITE CONDITIONS

- A. Job Condition Requirements:
 - 1. Apply roofing in dry weather.
 - 2. Do not apply roofing when ambient temperature is below 45° F.
 - 3. Coordinate the work of the contractor with the work to be performed by the Owner's personnel, to ensure proper sequencing of the entire work. The Owner's personnel will be erecting interior protection for equipment, if required. The contractor is to schedule his work so that adequate time is allowed for the Owner's personnel to perform the work. No roof work shall be performed until the Owner's personnel have completed erection of the interior protection in that area.
 - 4. Proceed with roofing work only when weather conditions are in compliance with manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with specifications.
 - 5. Schedule the work so the building will be left watertight at the end of each day. Do not remove more roofing material than can be reinstalled in any working day.
 - 6. All surfaces to receive new roofing shall be smooth, dry, and free from dirt, debris, and foreign material before any of this work is installed. Competent operators shall be in attendance at all times equipment is in use. Materials shall be stored neatly in areas designated by the Owner. Load placed on the roof at any point shall not exceed the safe load for which the roof is designed.
 - 7. The contractor shall take all necessary precautions to protect the roof mat and deck from damage. The contractor shall be responsible for repairing all new areas of damage caused by the negligence of the contractor, at the contractor's expense. The Owner's on-site representative shall determine damage caused by contractor negligence.
 - 8. The contractor shall follow local, state, and federal regulations, safety standards, and codes for the removal, handling, and disposal of asbestos containing materials, if present. When a conflict exists, use the stricter document.

9. Follow insurance underwriter's requirements acceptable for use with specified products or systems.
 10. Due caution should be exercised so as not to alter the structural integrity of the deck. When cutting through any deck, care should be taken so as not to damage the deck or any part of the deck, such as post tension cables, etc.
 11. All kettles shall have an automatic thermostat control, and temperature gauge, all in working order.
 12. The contractor is to verify the location of all interior ducts, electrical lines, piping, conduit, and/or similar obstructions. The contractor is to perform all work in such a manner as to avoid contact with the above-mentioned items.
 13. Surface and air temperatures should be a minimum 45° F during applications of cleaner and waterproof coating and remain above 45° F for a minimum of four (4) hours following applications. Verify compatibility of cleaner with coatings, paints, primers and joint sealers specified. Advise Owner's representative of any problems in this regard prior to commencing cleaning operations.
 14. Temporary Sanitary Facilities: The contractor shall furnish and maintain temporary sanitary facilities for employees use during this project. These will be removed after the completion of the project. All portable facilities shall comply with local laws, codes, and regulations.
- B. Protection of Work and Property:
1. Work: The contractor shall maintain adequate protection of all his work from damage and shall protect the Owner's and adjacent property from injury or loss arising from this contract. He shall provide and maintain at all times any OSHA required danger signs, guards, and/or obstructions necessary to protect the public and his workmen from any dangers inherent with or created by the work in progress. All federal, state, and city rules and requirements pertaining to safety and all EPA standards, OSHA standards, NESHAP regulations pertaining to asbestos as required shall be fulfilled by the contractor as part of his proposal.
 2. Property: Protect existing planting and landscaping as necessary or required to provide and maintain clearance and access to the work of this contract. Examples of two categories or degrees of protection are generally as follows: a) removal, protection, preservation, or replacement and replanting of plant materials; b) protection of plant materials in place, and replacement of any damage resulting from the contractor's operations.
 3. Twenty-four Hour Call: The contractor shall have personnel on call 24 hours per day, seven (7) days per week for emergencies during the course of a job. The Owner's Project Manager is to have the 24 hour numbers for the contact. Contractor must be able to respond to any emergency call and have personnel on-site within two (2) hours after contact. Numbers available to the Owner's Project Manager are to be both home and office numbers for:
 - a) Job Foreman
 - b) Job Superintendent
 - c) Owner or Company Officer
- C. Damage to Work of Others: The contractor shall repair, refinish, and make good any damage to the building or landscaping resulting from any of his operation. This shall include, but is not limited to, any damage to plaster, tile work, wall covering, paint, ceilings, floors, or any other finished work. Damage done to the building, equipment, or grounds must be repaired at the successful contractor's expense holding the Owner harmless from any other claims for property damage and/or personal injury.

- D. Measurements: It will be the contractor's responsibility to obtain and/or verify any necessary dimensions by visiting the job site, and the contractor shall be responsible for the correctness of same. Any drawings supplied are for reference only.
- E. Use of Premises:
 - 1. The contractor is advised that the Owner will occupy the building at all times, and the contractor must provide all safeguards required to protect personnel and to keep noise levels as low as reasonably possible for each operation.
 - 2. The contractor shall:
 - a) Coordinate work in such a manner as to not interfere with the normal operation of the building.
 - b) Assume full responsibility for protection and safekeeping of products stored on premises.
 - c) Agree to hold the Owner harmless in any and all liability of every nature and description which may be suffered through bodily injuries, including death of any persons by reason of negligence of the contractor, agents, employees, or subcontractors.
- F. Cleaning and Disposal of Materials:
 - 1. Contractor shall keep the job clean and free from all loose materials and foreign matter. Contractor shall take necessary precautions to keep outside walls clean and shall allow no roofing materials to remain on the outside walls.
 - 2. All waste materials, rubbish, etc., shall be removed from the Owner's premises as accumulated. Rubbish shall be carefully handled to reduce the spread of dust. A suitable scrap chute or hoist must be used to lower any debris. At completion, all work areas shall be left broom clean and all contractor's equipment and materials removed from the site.
 - 3. All bituminous or roofing related materials shall be removed from ladders, stairs, railings, and similar parts of the building.
 - 4. Debris shall be deposited at an approved disposal site.

1.08 WARRANTY

- A. Twenty (20) Year NDL Total System Warranty: The complete roofing system shall be guaranteed for a minimum of twenty (20) years from the date of Substantial Completion for this project. Guarantee responsibilities shall be as follows:
 - 1. Roofing contractor shall guarantee the entire roofing system for a period of two (2) years from the date of Substantial Completion.
 - 2. The materials manufacturer shall guarantee the entire roofing system as supplied by system manufacturer for a total period of twenty (20) years from the date of substantial completion.
 - 3. Membrane manufacturer shall provide the written warranty as specified.
 - 4. The entire roofing system shall be guaranteed to be watertight and against any failures of workmanship and materials. Repair of the system, including materials and labor, shall be done at no cost to the Owner.
 - 5. Warranty repairs shall be performed by a certified installer. The repairs shall be performed in accordance with the manufacturer's written instructions and recommended procedures so as to not void the warranty.

- B. During the proposal period each Contractor shall make arrangements with the materials manufacturer to provide the required warranty. Refer to Submittals Paragraph for requirements concerning submittals of warranty.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Compatibility: Provide materials that are recommended by manufacturers to be fully compatible with indicated substrates, or provide separation materials as required to eliminate contact between incompatible materials.
- B. Materials herein specified shall be supplied or approved in writing by the manufacturer issuing the warranty.
- C. The white polyester reinforced fleece backed adhered PVC with Elvaloy® roofing system shall only be applied by manufacturer approved and trained roofing contractors.
- D. The manufacturer shall have 15 years UL listing for the membrane to be used on the project. Membrane manufacturer shall have a minimum of 15 years FM approval, and 15 years manufacturing experience with the roofing membrane specified for this project.
- E. All roofing and roof accessories shall be installed in compliance with manufacturer's current specifications and details.
- F. All materials used on the project shall be asbestos free.

2.02 ROOFING MEMBRANE

- A. The white 60 mil polyester reinforced fleece backed PVC with Elvaloy® membrane shall have the following minimum physical properties:

<u>Property</u>	<u>Test Procedure</u>	<u>Physical Properties</u>
Color	ASTM D 751	White
Thickness	ASTM D 751	60 mil (.060")
Thickness over Scrim	ASTM D 7635	.030"
Polyester Fleece Backing		5.5 oz.
Reinforcement Scrim		Polyester
Solar Reflectance Index (SRI)	ASTM E 1980	109

- B. Basis of Design: Flex FB 60 Elvaloy® KEE Roof Membrane as manufactured by Flex Membrane International.
- C. Approved Manufacturer's and Membranes:
 1. Flex Membrane International Corp. / Flex FB 60 Elvaloy® KEE Roof Membrane
 2. The Garland Company / KEE- Stone® FB 60 mil
 3. Tremco Roofing & Waterproofing / TPA FB 60 mil Roof Membrane

2.03 FLASHING MEMBRANE

- A. The flashing membrane shall be a white Elvaloy® polyester reinforced flexible sheet shall have the following minimum physical properties:

<u>Property</u>	<u>Test Procedure</u>	<u>Physical Properties</u>
Color	ASTM D 751	White
Thickness	ASTM D 751	60 mil (.060")
Thickness over Scrim	ASTM D 7635	.031"
Reinforcement Scrim		Polyester
Solar Reflectance Index (SRI)	ASTM E 1980	109

- B. Basis of Design: Flex MF/R 60 Elvaloy® KEE Roof Membrane as manufactured by Flex Membrane International.

- A. Approved Manufacturer's and Membranes:

1. Flex Membrane International Corp. / Flex MF/R 60 Elvaloy® KEE Roof Membrane
2. The Garland Company / KEE-Stone 60 mil
3. Tremco Roofing & Waterproofing / TPA Flashing Membrane 60 mil

2.04 NON-REINFORCED MEMBRANE

- A. The non-reinforced membrane shall have the following minimum properties, or approved equal.
1. Description: Non-reinforced thermoplastic white membrane, thickness approximately 45 mils.
 2. Use: Inside/outside corners, multiangled intersections, sealant pockets and other conditions where molding of the membrane is required.

2.05 CAULKS

- A. Sealant for use at coping joints, reglet joints, etc., shall be a one-component urethane non-sag, gun grade sealant designed for use in active exterior joints, and shall meet or exceed Federal Specification No. 1 TT-S-00230C, Type II, Class A, ASTM C 920. Where joint surfaces are contained or are contaminated with bituminous materials, provide manufacturer's modified-type sealant (modified with coal-tar or asphalt as required), or approved equal.
- B. To seal the leading edge of the membrane, to bond membrane at terminations with metal, and for open seam repair, sealant shall be a thermosetting, solvent free, non-slump, self-fixturing, multipurpose structural sealant which shall meet the following physical and performance properties, M-1 as manufactured by Chem Link Inc., or approved equal.

Properties

Specific Gravity	1.62 (13.5 lbs./gallon)
Viscosity	800,000 cps Brookfield RTV, TF spindle, 4 rpm 70° F.
Shear Strength (ASTM D-1002)	300 psi+ (7 day ambient cure)
Elongation @ break (ASTM D-412)	300% (7 day ambient cure)
Hardness Shore A (ASTM C-661)	50 – 55 (14 day ambient cure)
Tack free time (ASTM C-679)	35 minutes
Low temperature flex	Minus 20° F: PASS
Slump (sag) (ASTM C-639)	Zero slump
Shrinkage (ASTM D-2453)	No measurable shrinkage (14 day cure)
Service temperature	-40° F to 200° F

- C. Polyether sealant: The joint sealant shall be a 100% solid, one-component, gun grade, non sag, polyether-base material. It shall be applicable for use at Kynar 500 coated metal, in, vertical, and overhead joints. The sealant shall cure under the influence of atmospheric moisture to form an elastomeric joint material. Materials shall comply to: ASTM C920, Type S, Grade NS, Class 50, Use T2, NT, M, A, G, and O; Canadian Specification CAN/CGSB-19.13-M87, Classification MCG-2-25-A-N, No. 81026; DuraLink as manufactured by Chem Link, Inc., or approved equal.

Properties

Results

Test Methods

Tensile strength, psi	250-300	ASTM D412
Peal strength, psi	25-30	ASTM C794
Elongation at break, %	750-800	ASTM D412
Hardness, Shore A	17-23	ASTM C661
Lap shear Strength, psi	150-175	ASTM D1002
Low temp. flexibility	Pass-10°F (-23°C)	ASTM D816
	1/4inch mandrel	
Service Temperature	-40°F to 200°F (-40°C to 93°C)	

2.06 SHEATHING PAPER

- A. For use as barrier layer between the wood deck and base ply/insulation; shall be rosin-sized sheathing paper.

2.07 BASE SHEET

- A. Shall be Underwriters Laboratory approved and listed in the FM Global Approval Guide.
- B. Shall be A Styrene Butadiene Styrene (SBS) 80 mils thick, smooth surfaced modified bitumen base sheet, tested in accordance with ASTM D 5147, as approved by field membrane manufacturer.
- C. Basis of Design: Flex SBS 80 mil S/S Base Sheet Roof Membrane as manufactured by Flex Membrane International.
- D. Approved Manufacturer's and Membranes:
1. Flex Membrane International Corp. / Flex SBS 80 Mil S/S Base Sheet
 2. The Garland Company / Stress Base
 3. Tremco Roofing & Waterproofing / POWERply Standard Smooth

2.08 INSULATION

- A. All insulation shall be approved in writing by the membrane manufacturer as to thickness, type, and manufacturer. All insulation must be approved for the specific application, Underwriters Laboratory approved, and be listed in the FM Global Approval Guide.
- B. Polyisocyanurate Roof Insulation: Insulation shall be a minimum of two (2) layers of rigid polyisocyanurate foam board; LTTR-value shall be a minimum of 25.0; meeting Federal Specification No. HH-I-1972/1 or 2 with 20 psi minimum compressive strength and 2.0 pcf minimum density. Board shall be surfaced on two (2) sides with non-asphaltic facer material. No layer shall be less than 1.5" or greater than 2.7" thick.
- C. Tapered Polyisocyanurate Roof Insulation: At structurally flat roof area, provide tapered polyisocyanurate insulation board per Federal Specification No. HH-I-1972/1 or 2, with a 20 psi minimum compressive strength and 2.0 pcf density minimum. Insulation shall be of thickness required for one-fourth inch (1/4") slope per foot to roof drains as shown on drawings. Insulation shall be surfaced on two (2) sides with a non-asphaltic facer material.
- D. Tapered Polyisocyanurate Roof Insulation Crickets: Shall be tapered polyisocyanurate board per Federal Specification No. HH-I-1972/1 or 2, with a 20 psi minimum compressive strength and 2.0 pcf density minimum. Insulation shall be of thickness required for one-half inch (1/2") slope per foot to roof drains as shown on drawings. Insulation shall be surfaced on two (2) sides with a non-asphaltic facer material.
- E. Cover Board: Impact-resistant, nonstructural, specially engineered gypsum and cellulose fiber panels with 95% recycled content; uniform water-resistance throughout core and surface. Board size four feet by eight feet (4' x 8'), thickness 1/2"; conforming to ASTM C 1278, meeting FM 4470 Class 1 criteria, classified by Underwriters Laboratory, and listed in the FM Global Approval Guide. Board will meet the following physical properties, Securock™ Roof Board, as manufactured by USG Corporation, or approved equal.

<u>Test</u>	<u>Typical Value</u>	<u>Test Method</u>
Fire Resistance	Class A	UL 790
Permeance	≤ 30	ASTM C473
Surface water absorption	≤ 1.6 nominal grams	ASTM C473
Water resistance	Maximum 10% weight percentage gain	
Mold Resistance	Minimum rating of "10"	ASTM D3273

2.09 FASTENERS AND PLATES

- A. General: All fasteners and plates for the installation of insulation, and for the installation of the membrane, shall be supplied and warranted by the membrane manufacturer for the specific application.
- B. All fasteners and plates shall be FM Global approved corrosion resistant screws or anchors supplied and warranted by the membrane manufacturer. Fasteners shall be of a type and length recommended by the manufacturer for fastening the insulation and/or protection layer (through the existing roof in reroofing) to the structural roof deck.

2.10 FASTENERS

- A. Fasteners and fastening plates or bars shall be listed in the FM Global Approval Guide, and be as recommended by the fastener manufacturer for the specific application.
- B. Fastener for Brick: Shall be one-fourth inch by two inches (1/4" x 2"), zinc with plated steel or stainless steel nail, one piece unit, flat head, as manufactured by Rawl Zamac Nailin, or approved equal.
- C. Fastener for Wood / Steel Deck: Shall be a #14 fastener, fluorocarbon coated, with CR-10 coating. A minimum .200 diameter shank and .250 diameter thread. To be used with round pressure plates or bar, and having a fluorocarbon CR-10 coating, when subjected to thirty (30) Kesternich cycles (DIN 50018) shows less than ten percent (10%) red rust which surpasses FM Global Approval Standard 4470, as manufactured by Olympic Manufacturing Group, Inc., or approved equal. Fasteners, plates, and/or bars shall be listed in the FM Global Approval Guide.

2.11 COLD APPLIED SUBSTRATE ADHESIVE

- A. Shall have the following minimum properties, as manufactured by Flex Membrane International, or approved equal.

<u>Property</u>	<u>Characteristics</u>
Type	Rubber, asphalt, resin dispersion; Water vehicle
Color Dried Film	Black
Viscosity	Approximately 18,000 cps. (Brookfield at 77° F) Heavy paint consistency -- readily pourable
Solids, Wt. %	Approximately 75%
Application Procedure	Brush, squeegee or roller
Working Period	Remains tacky permitting wet or dry combining over wide range of conditions.
Application Limits (Temp.)	Between 50 and 100° F. However apply at near mid-temperature range whenever possible.
Service After Application	Not affected by extremes in atmospheric conditions. Maintains good bond over range minus 20° F to plus 200° F. Excellent water and moisture resistance.
Caution	Keep from freezing. Store above 40° F
Weight per Gallon Net	Approximately 8.4 lbs.
Container Sizes	5 gallon
Primer Use	When the product is used over cementitious surfaces, the surface must first be primed 24 hours before adhesive applications. The primer should be a solvent base asphalt cut back. The application rate is approximately 3/4 gallon per 100 square feet.

2.12 BONDING ADHESIVE FOR FLASHING

- A. Description: Adhesive is a bonding cement of synthetic rubber for fully adhering membranes to various substrates, produced by Ashland Chemical, or approved equal.

Typical Liquid Properties (Room Temperature)

Color	Amber/Yellow
Base Product	Neoprene
Solids	25%
Specific Gravity	.87
Pounds/Gallon	7.25
Viscosity (CPS)	2500
Solvents	Ketone, Toluene, Aliphatic Hydrocarbon, Zylene
Estimated Coverage	
2 Sided Application	55/70 sq. ft. (2/2.5 mils dry)
DOT Label Required	Flammable Liquid
Code - 584661	

- B. Handling: Contains ingredients which could be harmful if mishandled. Contact with skin and eyes should be avoided and necessary protective equipment and clothing should be worn.

2.13 ASPHALT ROOF PRIMER

- A. To be used only where asphalt to asphalt products are employed; not for use on field membrane and cladded accessories. Shall be quick-dry asphalt-based primer for priming of asphalt roof surfaces or approved equal.

Applicable Federal Specification	SS-A-701B
ASTM	D 41
Flash Point	105° F
Viscosity at 80° F (ASTM D 217)	50-60 K.U.
Weight per gallon	7.4 pounds
Drying time (to touch)	Min. 4 hours

2.14 CANT STRIP

- A. Shall be wood fiber where used for non-structural purposes. Shall be treated solid wood where used for structural purposes meeting NRCA, FM Global and Underwriters Laboratory guidelines. If solid wood cant is used where insulation exists, cant is to be toe nailed into treated solid wood nailer the same height as insulation.

2.15 WOOD

- A. All nailers, cants and wooden curbs shall be fire rated, treated lumber as required by NRCA, FM Global and Underwriters Laboratory guidelines.

2.16 TRIM STRIP

- A. The trim strip shall be six inch (6") wide non-reinforced 45 mil thermoplastic used for capping butted ends of rolls or approved equal. The trim strip shall be seamed with the use of hot-air welding.

2.17 PIPE BANDS

- A. Stainless steel bands with self-locking heads.
- B. Tighten with hand tool for tension control and flush cut off.

2.18 PITCH PAN SEALANT

- A. Shall be one-part, self-leveling polyurethane sealant meeting Federal Specification No. TT-S-00230C, Type I, Class A, ASTM C 920, Type S, Grade P, Class 25, for use in new pitch pans, as manufactured by Flex Membrane International, or approved equal.

2.19 PIPESTANDS (6" OR SMALLER - LESS THAN 9" OFF ROOF SURFACE)

- A. Black, polycarbonate construction with stainless steel roller pin assembly suitable for gas lines and conduit set in finished roof assemblies, Model No. 24R, sized accordingly, as manufactured by Miro Industries, Inc.

2.20 LEAD FLASHING DRAINS

- A. Shall be four-pound (4#) lead, minimum thirty-six inches by thirty-six inches (36" x 36"), used for flashing of internal drains.

2.21 WALKWAY PAD

- A. The walkway pad shall have the following minimum physical properties, and be applied with edges heat or solvent welded, as manufactured by Flex Membrane International, or approved equal.

<u>Property</u>	<u>Test Procedure</u>	<u>Physical Properties</u>
Color		Gray
Size		36" wide x 60' long
Thickness	ASTM D 638	.080" nominal
Reinforcement		1000 Denier Polyester
Tear Strength	ASTM D 751	210 X 200 lbf
Puncture Resistance		96 lbs
Cold Resistance	ASTM D 1043	-40° C
Shore A Durometer		85
Hydrostatic Resistance		400 psi
Dimensional Stability	ASTM D 1240	≤ 1%
Ultraviolet Stability		12,000 hrs. Excellent

2.22 TERMINATION/PRESSURE BARS

- A. Aluminum strip shall be extruded channel bar with a mill finish, width one inch (1"), thickness 0.100" ± .008", leg height one-fourth inch (1/4") top and bottom, leg angle ninety degrees (90°), for perimeter and curb anchorage, having predrilled holes six inches (6") on center, as manufactured by Olympic Fasteners, or approved equal.

2.23 T- JOINT COVERS

- A. Supplied by the membrane manufacturer as a secondary covering to all T – Joints in the installation of thermoplastic roof systems consisting of waterproofing coverings equal to or greater than 60 mils in thickness.

2.24 VERTICAL WALL SHIMMING MATERIAL

- A. Shall be one of the following unless otherwise accepted by Owner's representative: OSB, exterior grade plywood, gypsum core board or concrete core board. Proper selection of material is required to achieve FM Global and UL guidelines.

2.25 SELF-ADHERING UNDERLAYMENT FOR TEMPORARY WATERPROOFING

- A. A premium heavyweight, minimum 60 mil, self-adhering underlayment, to use as a temporary waterproofing barrier and overnight seal.

2.26 DELIVERY AND STORAGE

- A. All materials shall be delivered with appropriate carton and can labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions. Materials damaged in shipping or storage shall not be used.

2.27 PRECAUTIONS

- A. Some of the indicated materials are extremely flammable and/or toxic. Use precautions indicated on can and carton labels.

2.28 MISCELLANEOUS MATERIALS

- A. Other materials shall be as specified or of the best grade for the proposed use as recommended by the manufacturer.

PART 3 - EXECUTION

3.01 REFERENCE

- A. The manufacturer's Technical Specifications shall be considered a part of this specification and should be referred to for more specific application procedures and recommendations.
- B. Application of materials shall be in strict accordance with the manufacturer's recommendations except where more stringent requirements are shown or specified. In the instance of a conflict between these specifications and those of the manufacturer, the more stringent specifications shall take precedence.
- C. General Installation:
 - 1. Protect adjacent areas with tarpaulin or other durable materials.
 - 2. Contractor shall prevent overspray and be responsible for parking lot areas and/or adjoining areas not part of this contract.
 - 3. Contractor shall be responsible for sealing, as required, all openings that may allow bitumen migration or drippage, i.e. pitch dams, envelopes, and filler strips.

4. Prepare surfaces according to manufacturer's or applicator's published instructions. All metal that is to receive bitumen, or come in contact with bitumen or adhesive, shall be first primed with appropriate primer. Any prefinished sheet steel that is to receive bitumen, or come in contact with bitumen or adhesive, shall be scored, scuffed or abraded prior to receiving primer.
5. Use cleaning materials or primers necessary to render an acceptable surface/substrate.
6. All surfaces/substrates shall be clean and dry prior to application of materials.
7. Prior to application of felts and membrane, all foreign matter, gravel, etc., shall be removed from the insulation and/or substrate. Gravel or debris between the insulation/substrate and plies is not acceptable.
8. Ambient temperature shall be 45° F and rising.
9. Stir/Circulate bituminous materials.
10. Wrinkles, buckles, kinks, and fishmouths are not acceptable when laying membrane.
11. Where deteriorated base flashing is removed, primed cant strips shall be installed at the intersection of the deck and the vertical surfaces. All flashings shall be mechanically top-fastened with a termination bar a minimum of six inches (6") on center at the top leading edge, and be a minimum of eight inches (8") in height from finished membrane.
12. Provide a water test of each roof section prior to substantial completion. The test should simulate rainfall of one inch (1") per hour minimum.
13. On slopes greater than one inch (1") in twelve inches (12"), refer to NRCA and/or manufacturer's guidelines for backnailing procedures and follow the more stringent guidelines for all specified materials.

3.02 SUBSTRATE PREPARATION

- A. Tear-off: Remove all built-up roofing, flashing, insulation, and sheet metal down to the roof deck or original substrate. Substrate shall be smooth, free of debris, sharp edges, and other surface irregularities prior to starting roofing application. Substrate repair shall be performed as required to minimum of NRCA standards.
- B. Metal Decks - Reroof:
 1. All loose rust, bitumen, or other foreign material shall be removed from the deck before applying asphalt primer at the minimal rate of one and one-half (1-1/2) gallons per one hundred (100) square feet of area.
 2. Deteriorated metal decking shall be repaired or replaced as required and as recommended by the deck manufacturer on a unit cost basis as approved by the Owner's representative.
 3. The metal deck shall be of like kind, quality, gauge and configuration. The deck span shall not exceed that recommended by FM Global Bulletin 1-28.
 4. If metal deck must be replaced:
 - a) Erect metal decking as recommended by the SDI. Properly align and level on structural supports.
 - b) Allow minimum three inch (3") bearing when supported by structural steel and minimum six inch (6") bearing when supported by masonry.
 - c) Care shall be exercised in the selection of electrodes and amperage to provide positive welds and to prevent blowholes.
 - d) Weld metal shall penetrate all layers of deck material at end laps and side joints and shall have good fusion to the supporting members.

- e) Side lap fasteners shall be No. 12, self-drilling, self-tapping screws.
- f) Install closure strips and angle flashings as required to close openings between deck and walls, columns and openings.
- g) Immediately after installation, touchup welds, burned areas and damaged spots with prime paint.
- h) Expansion/control joints shall be installed so that no one area exceeds two hundred feet by two hundred feet (200' x 200').

3.03 CATEGORY II (NON-FRIABLE) ASBESTOS CONTAINING MATERIALS (ACM) REMOVAL

- A. Owner and Contractor agree to exonerate, indemnify, defend, and hold harmless the roofing material manufacturer from and against all claims, demands, lawsuits, damages, expenses and losses incurred by Contractor's removal of asbestos-containing materials from Owner's building and work site. Contractor must conduct its operations according to applicable requirements including but not limited to those established by:
 - 1. Occupation Safety and Health Administration (OSHA).
 - 2. Environmental Protection Agency (EPA).
 - 3. Department of Transportation (DOT).
 - 4. State or Local Air Pollution Control Authorities/Agencies.
 - 5. State or Local Solid Waste or Hazardous Waste Authorities/Agencies.
 - 6. State or Local Health Department(s).
 - 7. State or Local Building Code Authorities.
 - 8. Other federal, state or local agencies or authorities.
- B. Contractor or Owner shall perform appropriate inspections, surveys and file timely notifications to proper authorities prior to starting roof renovation or demolition activities. Inspectors, project planners, project managers, contractors and workers involved in the roof project shall have appropriate training, licenses and registrations. Contractor and Owner shall be responsible for determining and implementing regulatory compliance activities, including but not limited to work practices, engineering controls, personal protection, air monitoring, testing, hazard communication, material handling, record retention, and arranging for waste disposal/handling.
- C. Contractor must file a Uniform Hazardous Waste Manifest from proper landfill site for each load of asbestos containing material removed. Copies must be sent to Owner and material manufacturer/specifier. Transportation of waste shall be in accordance with applicable Department of Transportation (DOT) requirements.

3.04 RECOVERY BOARD

- A. Manufacturer's Instructions: In regard to attachment, the manufacturer's instructions or specifications shall determine the suitability for an application.
- B. Recovery boards shall be laid on the substrate in parallel rows with end joints staggered and butted as close as possible. All joints shall be tight and at the roof perimeter and roof penetrations, recovery boards shall be cut neatly and fitted to reduce openings to a minimum. All openings one-fourth inch (1/4") or larger shall be filled with insulation.

- C. Recovery board shall be tapered or feathered at drains and scuppers to provide proper drainage (if applicable).
- D. No more recovery board shall be installed than can be covered by the completed roof system by the end of the day or the onset of inclement weather.

3.05 MECHANICALLY FASTENED BASE PLY

- A. Substrate shall be covered with specified base sheet mechanically fastened as follows:

Securement shall conform to the ASCE 7 criteria for wind uplift as dictated by wind zone applicable to location of project. Fasteners and fastening patterns shall be determined by building height, location and geographical area of the United States. It is the contractor's responsibility to consult current publications, literature, and bulletins of IBC and the fastener manufacturer that are in effect at the time of this project.

3.06 INSULATION

- A. Manufacturer's Instructions: In regard to attachment, the manufacturer's instructions or specifications shall determine the suitability for an application. Installation must meet ASCE 7 criteria and meet local governing building codes.
- B. Precautions: The surface of the insulation must not be ruptured due to overdriving of fasteners.
- C. Thermal insulation boards shall be laid on the substrate in parallel rows with end joints staggered and butted as close as possible. All joints shall be tight and at the roof perimeter and roof penetrations, insulation shall be cut neatly and fitted to reduce openings to a minimum. All openings one-fourth inch (1/4") or larger shall be filled with insulation.
- D. Insulation shall be tapered or feathered at drains and scuppers to provide proper drainage (if applicable). Shaving of insulation boards is not acceptable.
- E. No more insulation shall be installed than can be covered by the completed roof system by the end of the day or the onset of inclement weather.
- F. Tapered insulation and crickets, when specified, shall be placed in accordance with the drawings and/or as required to minimum of NRCA standards.

3.07 MECHANICALLY FASTENED INSULATION

- A. Specified insulation shall be loose laid over the substrate using offset joints, so that each layer breaks joints to a minimum of six inches (6") each way with the preceding layer. Then the specified cover board shall be laid over the thermal insulation layers and tapered insulation where applicable and mechanically fastened thru all underlying layers, the existing lightweight concrete and into the to the metal or wood decks to conform to the ASCE 7 criteria for wind uplift as dictated by wind zone applicable to location of project. Fasteners and fastening patterns shall be determined by building height, location and geographical area of the United States. It is the contractor's

responsibility to consult current publications, literature, and bulletins of IBC and the manufacturer that are in effect at the time of this project. Boards shall be staggered and butted as close as possible with voids over one-fourth inch (1/4") to be filled.

3.08 NAILERS

- A. Wooden nailers shall be installed at gravel stops, drip edges, and expansion joints on outside perimeter of building according to NRCA, Underwriters Laboratory and IBC guidelines.
- B. All Construction: Nailers shall be the same height as the new recovery board being installed where required. Nailers shall be raised if necessary by anchoring an additional nailer of appropriate height to the existing nailer if the existing nailer is not to be replaced. Nailers shall be anchored to resist a pull-out force of one hundred seventy-five pounds (175#) per foot. Fasteners shall be no less than two (2) per nailer, and be spaced at three feet (3') on center maximum. Expansion joint nailers shall extend upward a minimum of eight inches (8") above finish roof height.

3.09 WOOD CANTS

- A. Toe of cant shall be level with the surface to receive new roof membrane and in all cases anchored according to NRCA, Underwriters Laboratory and IBC guidelines.

3.10 COLD PROCESS APPLICATION OF BASE SHEET

- A. Cover board shall be covered with SBS 80 mil SS base sheet fully adhered as follows:

All layers shall be applied using modified bitumen adhesive by notched squeegee or spray equipment at the nominal rate of one and one-half to three (1.5 – 3) gallons per one hundred (100) square feet \pm 20 percent. Sheets shall be lapped four inches (4") on the sides and six inches (6") on ends. Sufficient adhesive shall be applied at laps to result in a visible bead of adhesive at completed lap edge. End and side laps shall be rolled with a weighted roller immediately after installation. Specified layers shall be applied in accordance with the manufacturer's recommendations and in accordance with general practices as set forth by the NRCA Roofing Manual. NOTE: Base may not be left exposed more than five (5) days. NO EXPECTATIONS.

3.11 COLD PROCESS APPLICATION OF FLEECE BACKED MEMBRANE

- A. Fully Adhered Application: Fully adhere membrane to acceptable substrate with substrate adhesive applied at the rate of one and one-half to three (1.5 – 3) gallons per one hundred (100) square feet \pm 20 percent or as specified by the manufacturer.
 - 1. The roof surface must be clean, dry and free of foreign material.
 - 2. Position sheets as indicated on approved shop drawings. Membrane shall be applied shingle fashion, perpendicular to the slope of the roof deck.
 - 3. The membrane material shall be unrolled, cut into twelve feet to eighteen feet (12'-18') lengths, placed upside down and allowed to "relax" prior to installation. Then re-roll to apply.

4. Install full width sheets, lapping four inches (4") on the sides and six inches (6") on ends. Stagger adjacent end laps a minimum of eighteen inches (18") apart. Where installed over base sheet, stagger sheet's side and end laps from underlying plies.
5. Starting at the low point or the drains, apply the modified bitumen cold adhesive to the substrate in either method as follows:
 - a. Pour the adhesive on the substrate and spread, using a serrated edged squeegee, applied at the rate of 1-1/2 gal per square.
 - b. Spray, using equipment that will apply the adhesive at a rate equal to one and one-half (1-1/2) gallons per square.
6. Apply the adhesive so that the substrate is coated in a pattern slightly larger than the first sheet being applied.
7. Lap seams shall be done by lapping the selvedge edge over the non-selvedge edge of the previous roll four inches (4"). End laps and selvage laps of the membrane being lapped shall be coated with adhesive so that a visible bead of adhesive appears. Roll all laps with a steel roller to ensure proper adhesion.
8. LAP OPTION: The end laps and side laps may be hot-air welded. The hot-air welding method will provide a watertight lap immediately and is preferable when inclement weather is threatening.
9. Carefully push into place from fold line to overlap, avoiding wrinkles and air pockets. Roll or broom membrane flat.
10. Repeat procedure for other sheet half.
11. T-joint covers are required over all T-joints on installations of thermoplastic roofing membranes equal to or greater than 60 mils in thickness. Center T-joint cover over the T-joint and completely hot air weld the cover to the field membrane.

B. Welded Lap Seaming Procedure: Overlap membrane for attachment method specified and hot-air welded with manufacturer's approved equipment.

1. All surfaces to be weld shall be clean, dry and free of foreign material.
2. All seams must then be checked with a needle probe and any voids repaired with the heat gun.

3.12 FLASHING

- A. Flash all penetrations, metal edge systems, walls, curbs, expansion joints, drains as shown on details and approved shop drawings with white reinforced Elvaloy® flashing membrane.
 1. Mechanically fasten flashing at terminations according to approved details.
 2. Fastening membrane flashing through metal counterflashing is not acceptable.
- B. Any lumber or shimming required for attachment or to make material flashing flush or level with offsets and/or transitions shall be incorporated in the flashing specifications.

3.13 BASE FLASHING (APPROXIMATELY 8" IN HEIGHT MINIMUM)

- A. Base flashings shall be installed using the flashing membrane, with length of run not to exceed twenty linear feet (20').
- B. Wooden nailers or curbs shall be installed at all edges and openings in the roof, mechanically fastened to the deck.

- C. Cant strips shall be installed at the intersection of the deck and all vertical surfaces.
 - D. The roofing field membrane shall extend up over and two inches (2") above the top of cant strips at all vertical intersections or out to the roof's edge.
 - E. All existing substrates receiving flashing membrane shall be clean and primed with primer, prior to application as required.
 - F. All flashings shall be mechanically fastened with a termination bar a maximum of eight inches (8") on center, be a maximum of eight inches (8") above finished roof height, extend a minimum of four inches (4") onto the field of horizontal roof membrane, and not exceed twenty linear feet (20') of run in length.
 - G. After proper termination of the base flashing at a minimum eight inch (8") height (or maximum eighteen inch (18") height), a counterflashing shall be installed according to NRCA and SMACNA guidelines.
 - H. All vertical flashing lap seams of the flashing membrane shall be hot-air welded.
 - I. All flashing membrane shall be adhered with flashing bonding adhesive to the vertical substrate and hot-air welded to the field of roof membrane; hot-air weld vertical laps.
 - J. Flashing laps shall be minimum two inch (2") width, no maximum. Hot-air weld of flashing lap shall be minimum two inch (2") width, no maximum.
 - K. Hot-Air Welding of Flashing Laps:
 - 1. When using a hand-held hot-air welder, the seams should be pressed together using a hand-held roller. The speed and temperature settings of the welding equipment can be affected by the weather conditions at the site of application, therefore, these parameters should be set by trial and error using two (2) pieces of the flashing membrane. Minimum width of hot-air weld two inches (2"), no maximum.
 - 2. Lay the laps together and apply pressure to the welded seam to ensure full adhesion.
 - 3. Allow the seams to set fully, and probe the entire length for voids. Reseal voids immediately with a hot-air gun and roller.
 - L. All hot-air welded seams/laps shall be tested daily with a probe for integrity, no variance.
- 3.14 VERTICAL WALL FLASHING (FOR USE APPROXIMATELY 8-18" ABOVE THE FINISHED ROOF LINE AND EXTENDING UPWARD)
- A. Flashing membrane shall be installed on the vertical beginning a minimum of eight inches (8") above the finished roof line (where the base flashing is terminated), with length of run not to exceed twenty feet (20'). Flashing shall be installed in strict accordance with the manufacturer's recommendations.
 - B. All existing substrates receiving flashing membrane shall be clean and primed with asphalt primer, prior to application.

- C. All substrates receiving welded-seam flashing membrane shall be clean and primed with primer, prior to application when applicable.
- D. The vertical wall flashing membrane shall be set in flashing bonding adhesive according to manufacturer's guidelines.
- E. All vertical flashing lap seams of the flashing membrane shall be hot-air welded.
- F. Flashing laps shall be minimum two-inch (2") width, no maximum. Hot-air weld of flashing lap shall be minimum two-inch (2") width, no maximum.
- G. Immediately following the laying of the flashing membrane, it shall be pressed or rolled in the width direction of the membrane. This will prevent excessive entrapment of air beneath the membrane. The pressing or rolling shall be in the width direction and with the laps so as not to buck the laps.
- H. Any flashing extending further than eighteen inches (18") up onto a vertical surface shall be installed using the strapped method and must be fastened with a termination bar or installed up and over the parapet wall and fastened to the nailer on the outside of the wall.
- I. The flashing membrane shall be run up the wall in sheet widths, run under the coping cap and be terminated on the outside of the wall six inches (6") on center; then the coping cap shall be reset. All side laps are to be hot-air welded.
- J. Hot-air Welding Laps:
 - 1. When using a hand-held hot-air welder, the seams should be pressed together using a hand-held roller. The speed and temperature settings of the welding equipment can be affected by the weather conditions at the site of application; therefore, these parameters should be set by the contractor by using two (2) pieces of flashing membrane. Minimum width of hot-air weld shall be two inches (2").
 - 2. Lay the laps together and apply pressure to the welded seam to ensure full adhesion.
 - 3. Allow the seams to set fully and probe the entire length for voids. Re-seam voids immediately with a hot-air gun and roller.
- K. All hot-air welded seams/laps shall be tested daily with a probe for integrity, no variance.
- L. Any lumber or shimming required for attachment or to make material flashing flush or level with offsets and/or transitions shall be incorporated in the flashing specifications.

3.15 PERIMETER FASTENING

- A. Wood nailers are required for perimeter gravel stops or drip edges. Field membrane and all plies shall be mechanically fastened to nailer on twelve-inch (12") centers maximum.

3.16 EDGING FLASHINGS

- A. An NRCA-approved gravel stop/fascia system shall be installed in strict accordance with published instructions to meet ES-1.

3.17 ROOF DRAINS

- A. Inspect and test drain and drain lines prior to start of work in contact area. Open if blocked or clogged and repair/replace all broken, missing drain components and lines as required. Verify in writing that all drains and lines are free flowing and watertight prior to substantial completion. Comply with local plumbing codes.
- B. Remove strainer and clamping ring. Repair (or replace if damaged) and reset.

3.18 WALKWAY PADS

- A. Fully adhere and heat weld walkway pads where shown on drawings or where required to provide protected pathways from rooftop access points to mechanical or other equipment requiring rooftop maintenance.

3.19 CLEANING

- A. Clean exposed surfaces of excess cement, adhesive, sealants, mortar and paint associated with the new work.
- B. Clean work area of excess roofing materials and installation debris daily.
- C. Repair or replace defaced or disfigured finishes caused by the work.

3.20 MEMBRANE CLEANING

- A. After all membrane has been installed, it shall be cleaned with a cleaning agent compatible with the membrane to return the membrane to like new appearance.

3.21 PROTECTION

- A. Protect all building surfaces against damage from roofing work.
- B. Where traffic must continue over finished, installed roofing system, protect membrane, underlayment accessories and finishes from damage.

3.22 MEMBRANE PROTECTION

- A. Where equipment pads, wood sleepers, or walkway slabs are to be installed over the roofing membrane, an additional layer of the roofing membrane shall be installed between the roofing membrane and the pad, sleeper, or slab. Due caution shall be exercised to prevent roofing membrane damage during placement. Where required, membrane shall be welded to field membrane to prevent slippage.

3.23 PIPING/CONDUIT

- A. Piping/conduit shall be raised to NRCA recommended heights, and new supports furnished. Permanent supports shall be installed upon pads approved by membrane manufacturer. Coordinate work with Owner's representative.
- B. All gas lines, piping, and conduits shall be coated with industrial grade yellow paint.

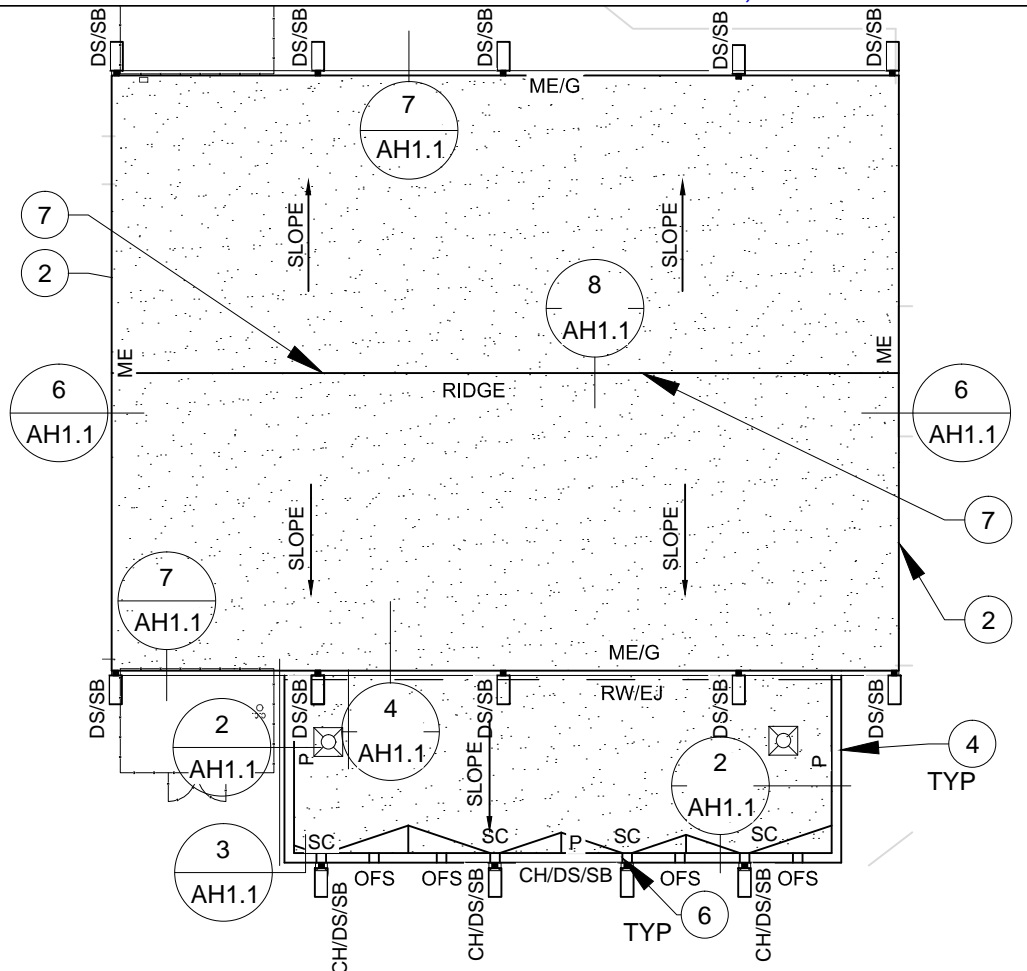
3.24 PIPE/EQUIPMENT SUPPORTS

- A. Designated pipe/equipment supports shall be removed and replaced with new specified pipe supports. Pipe supports shall be placed approximately ten feet (10') on center. New blocks shall be set on a double layer of membrane, and attached to the pipe with suitable strapping. Double layer of membrane shall be adhered to the roof surface.
- B. Gas lines three inches (3") and over must be supported on wood block with pipe roll stands.

3.25 OVERNIGHT SEAL

- A. Shall be performed according to accepted roofing practice as outlined in the NRCA Roofing Manual, SPRI and membrane manufacturer's recommended procedure.
- B. The roofing membrane shall be sealed to the roof deck or existing roof at the end of the day or at the onset of inclement weather to prevent water from flowing into the completed roofing system. Temporary seals shall be removed upon resumption of work.

END OF SECTION 07535



SPECIFIC ROOF NOTES

1. PROVIDE PREFINISHED METAL EDGE FLASHING AS SPEC. AND DETAILED.
2. PROVIDE PREFINISHED RAKE FLASHING AS SPEC. AND DETAILED.
3. PROVIDE ROOF TO RISE WALL EXPANSION JOINT FLASHING AS PER DETAIL 4, SHEET AH1.1 FOR DESIGN INTENT TO PROVIDE WATER TIGHT CONDITION
4. REMOVE THE EXISTING PARAPET COPING IN ITS ENTIRETY WHERE NEW CONSTRUCTION OCCURS. PROVIDE NEW NAILERS TO ACCOMMODATE FOR THE EXPANSION JOINT AS DETAILED. PROVIDE NEW PREFINISHED METAL CAP FLASHING AS DETAILED.
5. CONTRACTOR TO VERIFY WITH OWNER AND MEP ENGINEER AND REMOVE ANY ABANDONED OR NON-FUNCTIONAL ROOF TOP EQUIPMENT. PATCH EXISTING OPENINGS TO MATCH EXISTING AND PROVIDE NEW ROOFING AS SCHEDULED.
6. ENLARGE EXISTING THRU-WALL SCUPPER OPENINGS TO 16" WIDE BY 8" HIGH TYP. AT ALL LOCATIONS. PROVIDE EMERGENCY OVERFLOW SCUPPER OF SAME DIMENSION ADJACENT TO PRIMARY SCUPPER AS DET.
7. REMOVE ROOF VENTS AND REPLACE WITH NEW METAL PANELS TO MATCH EXISTING PANELS IN PROFILE, TYPE, STYLE, AND/OR GAUGE PRIOR TO INSTALLING NEW OVERLAY ROOFING SYSTEM.



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ROOF PLAN (ALTERNATE #3)

SCALE: 1" = 20' (CARNAHAN)

P.S.J.A. ISD - CARNAHAN, FRANKLIN & BUELL
HVAC ADDITIONS TO GYMS

ADDENDUM #3



EGV ARCHITECTS, INC.
220 S. BRIDGE STREET
PO BOX 8627
HIDALGO, TX 78557

TEL: (956) 843-2987
FAX: (956) 843-9726

DATE:

FILE:
DWG/

SCALE:

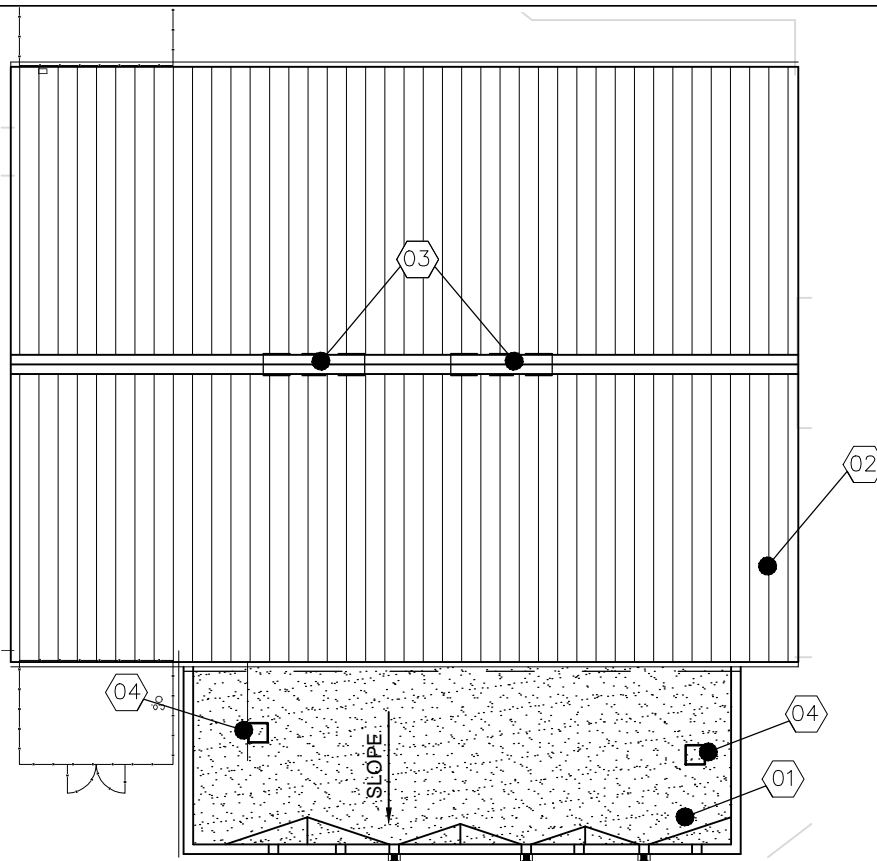
SHEET

AH1.1

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MAY 24 2019



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EXISTING ROOF (ALTERN. #3)

SCALE: 1"=20' (CARNAHAN)

DEMOLITION NOTES:

- 01 EXISTING MODIFIED BITUMEN ROOF TO BE REMOVED DOWN TO DECK. REFER TO ROOF PLAN DETAIL 1/AH1.1 & SPEC 07535
- 02 EXISTING METAL ROOF TO REMAIN & BE OVERLAID WITH NEW ROOFING SYSTEM. SEE ROOF PLAN DETAIL 1/AH1.1 & SPEC 07535
- 03 EXISTING RIDGE VENTS TO BE REMOVED & OPENING TO BE FILLED IN WITH METAL TO MATCH EXISTING BEFORE INSTALLING NEW ROOF
- 04 EXISTING ROOF TOP EQUIPMENT. PROVIDE NEW FLASHING
- 05 ALL EXISTING CONCRETE SPLASHBLOCK TO BE REPLACED
- 06 REMOVE & REPLACE ALL PARAPET COPING, GUTTER, DOWNSPOUTS AND TRIMS

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HVAC ADDITIONS TO GYMS

ADDENDUM #3

DATE:

FILE:
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SCALE:

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1 OF 1



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