



ADDENDUM No. 1
Request for Competitive Sealed Proposals (CSP)
19CSP098 Roof Improvements at Kealing Elementary School

January 24, 2019

Item 1: Updates to Specifications

Item 1:

Updates to Specifications in reference to this project can be found at planroom.millerids.com under 19CSP098

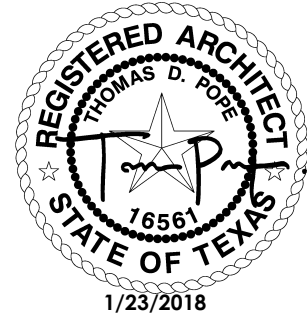
ADDENDUM No. 1

Roof Improvements at Kealing Elementary School
Austin Independent School District
AISD Project No. 18-0013-KEALG

Addendum Date: January 23, 2019

Bid Due Date: February 5, 2019 @ 2:00 P.M.

Notice to Bidder



- A. This Addendum shall be considered part of the Contract Documents for the above-mentioned project as though it had been issued at the same time and incorporated therewith. Where provisions of the following supplementary data differ from those of the original Contract Documents, this Addendum will govern and take precedence.
- B. Bidders are hereby notified that they shall make any necessary adjustment in their estimates on account of this Addendum. It will be construed that each Bidder's proposal is submitted with full knowledge of all modifications and supplemental data specified herein.
- C. Acknowledge receipt of this Addendum by inserting its number and date on the Proposal Form.

Changes to Bid Documents

ITEM 1: Refer to **Specification Section, 07 5400 – Thermoplastic Roof System.** Replace specification section in its entirety with the attached;
07 5400 – Thermoplastic Roof System

END OF ADDENDUM NO. 1

SECTION 07 5400 - THERMOPLASTIC ROOF SYSTEM

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 through Division 49 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Installation of new adhesively applied PVC/KEE roof membrane.
 - 2. Fasteners.
- B. Related Sections
 - 1. Section 01 7830 - Roofing Installer's Warranty
 - 2. Section 06 1050 - Roof Carpentry
 - 3. Section 07 2200 - Roof Insulation
 - 4. Section 07 6200 - Flashing and Sheet Metal

1.3 REFERENCES

- A. American Society of Civil Engineers (ASCE): ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- B. Single-Ply Roofing Institute (SPRI): Application Guidelines and Wind Design Guidelines for Various Single Ply Membranes.
- C. National Roofing Contractors Association (NRCA): Current Roofing and Waterproofing Manual.
- D. Underwriters Laboratories (UL):
 - 1. Roof Materials and Systems Directory. 2009.
 - 2. UL 790: Tests for Fire Resistance of Roof Covering Materials: 1983.
- E. American Society for Testing and Materials (ASTM)
 - 1. ASTM D 570: 1981 (R 1988) Water Absorption of Plastics
 - 2. ASTM D 638: 1991 Tensile Properties of Plastics
 - 3. ASTM D 751: 1989 Coated Fabrics
 - 4. ASTM D 882: 1991 Tensile Properties of Thin Plastic Sheeting
 - 5. ASTM D 1004: 1990 Initial Tear Resistance of Plastic Film and Sheeting
 - 6. ASTM D 1204: 1984 Linear Dimensional Changes of Non-rigid Thermoplastic Sheeting or Film at Elevated Temperature
 - 7. ASTM D 2136: 1984 (R 1989) Coated Fabrics – Low-Temperature Bend Test
 - 8. ASTM D 2565: 1982 Operating Xenon Arc-Type Light Exposure Apparatus With and Without Water for Exposure of Plastics
 - 9. ASTM D 3045: 1974 (1984) Heat Aging of Plastics Without Load
 - 10. ASTM D 4434: 1987 Poly (Vinyl Chloride) Sheet Roofing

11. ASTM E 108: 1991 (Rev. A) Fire Tests of Roof Coatings
12. ASTM G 21: 1990 Determining Resistance of Synthetic Polymeric Materials to Fungi
13. ASTM G 53: 1991 Operating Light – and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials

1.4 SUBMITTALS

- A. Submit under provisions of Division 01 Section – Submittals.
- B. Shop Drawings: Provide layout of insulation, including crickets. Indicate dimensions, layout, spans, joint construction details, methods of anchorage, method and sequence of installation, locations of drainage devices, etc. Show sheet layout for entirety of project, with all side and end laps indicated in the intended locations. Show slope designations for all roof areas. Show on each drawing, seams to be field-welded and those that will be factory-welded.
- C. Product Data: Indicate membrane, base flashing materials, insulation, traffic pads, mechanical fasteners and fastening pattern, and all other proposed materials and accessories.
- D. Manufacturer's Installation Instructions: Include installation sequence, special instructions and Material Safety Data Sheets (MSDS) for all products.
- E. Manufacturer's Certification: Provide current letter(s) on membrane manufacturer's letterhead, signed by an authorized employee or corporate officer, attesting to all following items:
 1. Qualifications: Certify and document items in the Article on Qualifications, and;
 2. Membrane Manufacturer: Certify that the membrane manufacturer directly manufactures the roofing membrane; that the product is not made by a third party and then re-labeled.
 3. Other Products: Certify that selected products of the roofing system meet or exceed specified requirements, including that:
 - a. roofing system components are physically and chemically compatible for installation as designed; and
 - b. all proposed materials, including those by other manufacturers, are acceptable to membrane manufacturer for use in the system; and
 - c. proposed system meets all requirements for issuance of manufacturer's warranty; and
 - d. specifically identify and define any deviations.
 4. Installer: Certify that installer is approved by manufacturer for installation of selected products.

1.5 PERFORMANCE REQUIREMENTS

- A. General Requirements: Provide an installed thermoplastic single ply roofing system, flashings and related work that are watertight and will not permit the passage of liquid water, that will withstand wind loads, thermally induced movement, and exposure to weather without failure.

- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.
- C. Underwriters Laboratories Inc. (UL):
 - 1. UL RMSD – 2011 Roofing Materials and Systems Directory
 - 2. UL 790 – 2011 Fire Resistance of Roofing Coverings Materials
 - 3. Exterior Fire Exposure Classification: Class A, ASTM E 108, for application and slopes shown.
- D. FM Listing, General Performance, Wind Uplift: Provide sheet membrane, base flashings, and component materials that comply with requirements in FM Approvals 4450 and FM Approvals 4470 as part of a roofing system and as listed in the FM Approvals' "RoofNav" for a Class 1 or noncombustible construction as applicable. Identify materials with FM markings. Roofing System shall comply with the following:
 - 1. FM D/S1-29 – 2006 Adhered Single Ply Roof System.
 - 2. Fire Resistance: Class 1A
 - 3. Hail Resistance Rating: SH
- E. American National Standards Institute (ANSI)
- F. American Architectural Manufacturer's Association (AAMA)
- G. Occupational Safety and Health ACT (OSHA)

1.6 QUALITY ASSURANCE

- A. Work of this Section shall conform to the most current editions of the "NRCA Roofing and Waterproofing Manual," "Handbook of Accepted Roofing Knowledge," published by the NRCA; Manufacturer's Installation Instructions; and these Construction Documents.
- B. Maintain one copy of each document accessible to site.
- C. The manufacturer's representative shall make a minimum of two (2) site visits to the project per month at critical stages of the roof installation, and forward written reports of the observations and instructions given to the Contractor during these visits to the Architect. The visits shall be coordinated to take place at the time of the Architect's visits, with one occurring at the monthly pay application meeting. The reports shall include, at the minimum, the following information:
 - 1. Reports shall be typewritten on the manufacturer's letterhead stationery and be provided to the Architect within seven (7) days of the site visit.
 - 2. Reports shall document the Work in progress and list all deficiencies, corrective actions and recommendations.
 - 3. Failure of the manufacturer's representative to provide the required reports is cause for rejection of the Contractor's pay application.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products and systems specified in this Section with minimum five years documented experience, including a minimum of three (3) projects of comparable size, using specified system, installed in the State of

Texas within that five-year period. Manufacturer shall certify, in writing, all materials to be used in the roof assembly as being compatible with their system, whether manufactured by that company or by others.

- B. Installer Qualifications: A qualified firm that has been continuously approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and specified roof system for minimum of five (5) years prior to Bid Date,
1. Certified by roofing materials manufacturer as an approved NDL applicator for minimum of five (5) years prior to Bid Date, and qualified to provide specified warranty on selected systems and flashings.
 2. Successful completion of minimum five (5) projects of comparable size and specified systems during that time.
 3. Workers: All roofers and laborers to be direct employees of Primary Contractor.
 - a. Installer Project Manager and Superintendent: Minimum five years roofing experience and employed by Contractor for a minimum one year prior to Bid Date.
 - b. Installer Non-working Supervisor: Able to communicate effectively with School staff and Applicator's workers and employed by Contractor for a minimum one year prior to Bid Date.
 - c. Installer Tradesmen: Minimum 50-percent of installation crew to have been employed by Contractor for a minimum six months prior to Bid Date.
 4. Assign a qualified, full time, non-working supervisor to be on Project site at all times during installation of Work.
 5. Designate a responsible Project Manager or Superintendent to inspect all installed Work, particularly tie-ins and temporary flashings, at end of each working day and as otherwise required to ensure water-tightness.
 6. Verify Inspection by signature on approved Daily Inspection Form signifying installation is in accordance with specified requirements.

1.8 PRE-INSTALLATION CONFERENCE

- A. Convene a pre-installation conference two weeks prior to commencing Work. Those in attendance shall be the Contractor's Project Manager and Superintendent, Manufacturer's Representative, Owner and Owner's Director of Facilities Representative(s), Architect and his designated representative(s).
1. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 2. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 4. Review structural loading limitations of roof deck during and after roofing.
 5. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
 6. Review governing regulations and requirements for insurance and certificates if applicable.
 7. Review temporary protection requirements for roofing system during and after installation.

8. Review roof observation and repair procedures after roofing installation.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components. Deliver materials in sufficient quantity to allow work to proceed without interruption.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within temperature range required by roofing system manufacturer.
 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Store and protect materials, including roofing insulation from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store all materials in a dry location. Use pallets to support all materials from roof deck. Distribute the load to stay within live load limits of the roof construction. Remove unused materials from the roof at the end of each day's work. Comply with roofing manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck
- E. Maximum Allowable Loading on Roof: 20 pounds per square foot.

1.10 PROJECT CONDITIONS - ENVIRONMENTAL REQUIREMENTS

- A. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit roofing to be installed per manufacturer's written instructions and warranty requirements.
- B. Do not apply roofing membrane to damp or frozen deck surface.
- C. Observe actual and predicted temperatures, relative humidity, wind, wind chill and other weather conditions. Apply roofing system only when all conditions are within ranges acceptable to membrane manufacturer.
- D. Environmental Requirements:
 1. Apply roofing in dry weather.
 2. Do not expose roof components and flashing in inclement weather or when it is predicted 30% or more possibility for inclement weather.
 3. When ambient temperature is below 40 degrees Fahrenheit, expose only enough sensitive cements, sealants, and adhesives as required for use within a four-hour period.
 4. Do not expose membrane and accessories to a constant temperature of 180 degrees Fahrenheit.
 5. Observe wind chill and other cold weather conditions for proper adhesive application.

1.11 SEQUENCING AND SCHEDULING

- A. Coordinate with demolition Work and with Work of other trades to ensure sufficient materials and manpower are available to completely replace and make watertight all roofing removed each day.
- B. Limit installation of roofing to amount that can be completely covered with new roof system by end of each day.
- C. Coordinate installation of associated metal flashings and roof related items as Work of this Section proceeds. Seal all sheet metal flanges in contact with membrane the day it is installed.
- D. Schedule Work to avoid storage on, and traffic over, finished Work.

1.12 WARRANTY

- A. Applicator: Two-Year warranty for installation and Workmanship using the form found in Section 01 7830.
- B. Manufacturer: 20-Year No-Dollar-Limit System Warranty from roof materials manufacturer covering full replacement of all materials and labor.

PART 2 - PRODUCTS

2.1 THERMOPLASTIC MEMBRANE MANUFACTURERS

- A. Sika Sarnafil
- B. Johns Manville
- C. Carlisle
- D. FiberTite
- E. Versico

2.2 SHEET MATERIALS

- A. Single Ply Membrane:
 - 1. Sika Sarnafil: G410: 80 mil
 - 2. Johns Manville: JM PVC: 80 mil
 - 3. Carlisle: Sure-Flex KEE; 80 mil
 - 4. FiberTite: FiberTite-SM; 60mil
 - 5. Versico: VersiFleece KEE; 80 mil
- B. Single Ply Membrane Properties: Polyester fabric reinforced, heat-weldable sheets; fabricated from thermoplastic (PVC/KEE) with permanent, non-migrating plasticizers; minimum thickness listed in 2.1.A; UL Class A.
 - 1. Membrane to be resistant to puncture, tearing, elongation, ultraviolet rays, micro-organisms, and caustic chemicals.
 - 2. Felt/Fleece Backing: Polyester with a weight content of 9 ounces per square yard.
 - 3. Membrane exposed surface color to be white.

2.3 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing materials.
1. Furnish liquid-type auxiliary materials that meet VOC limits of authorities having jurisdictions.
- B. Flashing and Flashing Accessories: As recommended by the Thermoplastic sheet manufacturer's printed instructions for reinforced sheet flashing of same material type and color as sheet membrane.
- C. Fasteners: Manufacturer approved corrosion resistant steel screws of the appropriate size for fasteners for roof membrane and insulation attachment and for sheet metal flashing. Fasteners for the membrane shall be supplied by the thermoplastic manufacturer and are to be installed as recommended by PVC/KEE sheet manufacturer's printed instructions.
- D. Securement Plates: FM approved corrosion resistant steel plates of the appropriate size for the securement of the membrane, insulation and cover boards to approved substrates. Securement plates for the membrane, insulation and cover boards shall be supplied by the thermoplastic manufacturer and are to be installed as recommended by the PVC/KEE manufacturer's printed instructions.
- E. Membrane Bonding Adhesive: Application rates are to be as recommended by thermoplastic sheet manufacturer's printed instructions.
1. Sika Sarnafil: Sarnacol 2121
 2. Johns Manville: JM PVC Membrane Adhesive
 3. Carlisle: Sure-Flex PVC/KEE HydroBond Water-Based Adhesive
 4. FiberTite: FTR-490 Water Borne Elastomeric Adhesive
 5. Versico: PVC Hydro Water-Based Adhesive
- F. Membrane Flashing Bonding Adhesive: Manufacturer's adhesive used to attach the flashing membrane to the substrate, either horizontally or vertically. Application rates are to be as recommended by thermoplastic sheet manufacturer's printed instructions.
- G. Metal Termination Bars: Manufacturer's standard aluminum bars, approximately 1-inch (25-mm) wide, roll formed and pre-punched every 6 inches on center.
- H. Sealants: Membrane manufacturer's approved sealant shall be used to seal penetrations through the membrane system and at miscellaneous sealant applications that are exposed to roof systems components.
- I. Membrane Securement Bar: An approved, heavy-duty 14 gauge, galvanized or stainless, roll-formed steel bar used to attach membrane to the roof deck. The formed steel is pre-punched with holes every 1 inch on center to allow various fastener spacing options.
- J. Sealing Tape: A high performance sealant tape with superior surface tack that remains elastic and is designed to bond the PVC/KEE membrane and a variety of metals. Sealing tape strip is used to seal the metal roof edge of buildings reducing air infiltration into the roof assembly, behind the PVC/KEE membrane flashing at termination details, and to seal the overlaps of the air/vapor retarder membrane.

- K. Miscellaneous Accessories: Provide pourable sealants, performed cone and vent sheet flashings, performed inside and outside corner sheet flashings, T-joint covers, termination reglets and other accessories as recommended by roofing system manufacturer for intended use.
- L. Other miscellaneous materials shall be of the "best grade" available and to be approved in writing by the roofing manufacturer, prior to use, for the specific application.
- M. PVC/KEE-Coated Metal: Manufacturer's standard membrane coated galvanized metal. See Section 07 6200 for fasteners and sealant.

2.4 ROOF WALKWAYS

- A. Walkway: A factory-formed, nonporous, heavy-duty, slip resisting, surface-textured protection pads, approximately 9/16 inch (14 mm) in thickness, as supplied by the PVC/KEE Manufacturer. Color of protection pads shall Light Grey.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine and verify that receiving substrate surfaces of the structure have no defects or errors, which would result in poor or potentially defective application or cause latent defects in workmanship.
 - 1. Do not permit voids greater than 1/4-inch wide in the substrate. Substrates for roofing materials shall be dry and free of oil, dirt, grease, sharp edges, and debris. Inspect substrates, and correct defects before application of roofing system.
- B. Roofing contractor is to verify that roofing openings and penetrations are in place, set, and braced and that roof drains are properly clamped into position and are in a functional condition.
- C. Do not proceed with installation until all unsatisfactory conditions have been corrected. Starting installation shall imply contractor's acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Clean substrate of dust, debris, and other substances detrimental to roofing installation per roofing system manufacturer's written instructions. Remove all sharp projections.
- B. The roofing contractor will be entirely responsible for the complete removal of all dirt, debris, moisture from the roof's substrate. The roof's substrate must be 100% completely dry before the installation of the specified roofing assembly. There will be no exceptions to this requirement.
- C. Fill all gaps and voids between substrate components that are wider than 1/4 inch. Fill all gaps with same materials as the substrate.

- D. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- E. Protect adjacent areas or surfaces from damage as a result of the Work of this section.
- F. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of the roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 MEMBRANE APPLICATION

- A. General: Install in strict accordance with manufacturer's latest published requirements, instructions, specifications, details and approved shop drawings.
- B. Install sheet per ASTM D 5036. It is the responsibility of the roofing contractor to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use of ASTM D5036.
- C. Install PVC/KEE membrane sheet per manufacturer's requirements to obtain manufacturer Twenty (20)-year Standard (NDL) warranty.
- D. Install in strict accordance with manufacturer's latest published requirements, instructions, specifications, details and approved shop drawings.
- E. Start installation of sheet in presence of roofing system manufacturer's technical personnel.
- F. The PVC/KEE membrane is to be adhered with manufacturer's approved adhesive. Membrane overlaps shall be shingled with the flow of water where possible. Tack welding of the PVC/KEE membrane side laps for purposes of temporary restraint during installation is not permitted.
- G. Installation of PVC/KEE membrane:
 - 1. The PVC/KEE membrane shall be adhered to the specified cover board substrate with the PVC/KEE manufacturer's approved adhesive.
 - 2. The means of application and the quantities of the membrane adhesive to be used shall be per the manufacturer's recommendations. Consult manufacturer on proper application rates for adhering the membrane to the acceptable substrates.
 - 3. The adhesive shall be applied in smooth, even coating with no gaps, globs, puddles or similar inconsistencies.
 - 4. Only an area that can be completely covered in the same day's operations shall be coated with adhesive. Do not allow adhesive on the cover board to dry completely. Ambient temperature, humidity and size of the roofing crew will determine the amount of membrane that can be installed with adhesive.
 - 5. Do not applied adhesive when outdoor or substrate temperatures during drying period are expected to fall below 40° F (5° C).
 - 6. Do not apply adhesive when air temperature is within 5° F of dew point.

7. After adhering the PVC/KEE membrane, the PVC/KEE membrane shall be rolled firmly into place by using an approved weighted roller and by frequently rolling the weighted roller in two or more directions.
 8. Contractor is to ensure there are no wrinkles and “fish-mouths” in the PVC/KEE membrane and in the overlap membrane seams.
- H. Mechanically fasten sheet securely at all vertical to horizontal transitions, at points of terminations, and at the perimeter of roof to meet PVC/KEE Manufacturer’s Technical Department’s requirements for properly securing the specified roofing system.
- I. Use fastener tools with a depth locator and torque-limiting attachment as recommended or supplied by fastener manufacturer to ensure proper installation of membrane securement fasteners.
- J. Securement Around Perimeter and Rooftop Penetrations:
1. Around all perimeters, at the base of walls, drains, curbs, vent pipes, or any other roof penetrations, manufacturer’s fasteners and securement plates shall be installed. Fasteners and securement plates shall be installed accord to the manufacturer’s instructions. Fasteners shall be installed using the fastener manufacturer’s recommended fastening tools with depth locators.
 2. PVC/KEE membrane flashings shall extend a minimum of 3 inches past the securement bar or plates and is hot air welded to the PVC/KEE deck sheet.
 3. Mechanically fasten sheet securely at all vertical to horizontal transitions, at points of terminations, at the corners, and at the perimeter of roof to meet the project’s wind uplift requirements.
- K. Spread sealant bed over deck drain flange at deck drains and securely seal roofing sheet in place with drain clamping ring.
- L. Field-seam per to “Seam Installation” Article.

3.4 SEAM INSTALLATION

- A. General:
1. Hot air welding equipment shall be provided by or approved by the roofing manufacturer.
 2. All mechanics intending to use the hot air welding equipment shall have successfully completed a one-day PVC/KEE Manufacturer’s training course prior to starting the referenced project. Copy of the training class attendees shall be submitted to the Owner’s Representative prior to starting the project.
 3. All PVC/KEE membrane and membrane flashing to be welded shall be clean and dry.
 4. Tack welding of the membrane is not allowed. All seams shall be completely hot air welded.
 5. Seam overlaps should be 3 inches (75 mm) wide when automatic machine-welding and 4 inches (100 mm) wide when hand-welding, except for certain details
- B. Hand-Welding:
1. Hand-welded seams shall be completed in two stages. Hot-air welding equipment shall be allowed to warm up for at least one minute prior to welding.
 2. The back edge of the seam shall be welded with a narrow but continuous weld to

- prevent loss of hot air during the final welding.
3. The nozzle shall be inserted into the seam at a 45-degree angle to the edge of the membrane. Once the proper welding temperature has been reached and the membrane begins to "flow," the hand roller is positioned perpendicular to the nozzle and pressed lightly. For straight seams, the 1½-inch (40-mm) wide nozzle is recommended for use. For corners and compound connections, the ¾ inch (20 mm) wide nozzle shall be used.
- C. Machine Welding:
1. Machine welded seams are achieved by the use of PVC/KEE manufacturer's approved robotic hot air welding machine.
 2. All applicable building local and OSHA codes for electric supply, grounding and over current protection observed. Dedicated circuit house power or a dedicated portable generator is recommended. No other equipment shall be operated off the generator.
 3. Metal tracks shall be used over the deck membrane and under the machine welder to minimize or eliminate wrinkles along the seam.
- D. Quality Control of Welded Seams:
1. The Applicator shall check all welded seams for continuity using a rounded screwdriver. Visible evidence that welding is proceeding correctly is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of dark grey material from the underside of the top membrane.
 2. On-site evaluation of welded seams shall be made daily by the Applicator at locations as directed by the Owner's Representative or PVC/KEE Manufacturer's representative.
 3. One inch (25-mm) wide cross-section samples of welded seams shall be taken at least three times a day by the Contractor.
 4. Contractor shall label each seam test cut with the time, date, and location of the test cut.
 - a. Retain test cuts for the PVC/KEE manufacturer's technical representative's inspection and evaluation.
 5. Correct welds display failure from shearing of the membrane prior to separation of the weld.
 6. Repair tears, voids, and lapped seams in roofing that does not meet requirements.
 7. Each test cut shall be patched by the Applicator at no extra cost to the Owner.
 8. All membrane seams, both field and flashings, shall be hot air welded and probed daily.
- 3.5 FLASHINGS AND ACCESSORIES
- A. General: All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and the manufacturer. Approval shall only be for specific locations on specific dates. Flashing shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces. Use caution to ensure adhesive fumes are not drawn into the building.
- B. PVC/KEE Manufacturer's approved adhesive, shall be used to adhere the PVC/KEE membrane flashing to acceptable wall and equipment curb substrates. No bitumen shall be in contact with the PVC/KEE membrane. If bitumen exists, then the manufacturer's

asphalt resistant membrane shall be use for the membrane flashing.

- C. PVC/KEE Manufacturer's Approved Adhesive for Membrane Flashings:
 - 1. Over the properly installed and prepared flashing substrate, contact adhesive shall be applied per instructions found on the Product Data Sheet. The adhesive shall be applied in smooth, even coats with no gaps, globs or similar inconsistencies. Only an area that can be completely covered in the same day's operations shall be flashed. The bonded sheet shall be pressed firmly in place with a hand roller.
 - 2. No adhesive shall be applied in seam areas that are to be welded. All panels of membrane shall be applied in the same manner, overlapping the edges of the panels as required by welding techniques.
 - 3. All flashing membranes shall be consistently adhered to substrates. All interior and exterior corners and miters shall be cut and hot-air welded into place. Where applicable, manufacturer's pre-fabricated corners shall be used.
- D. All flashings shall extend a minimum of 12 inches (0.2 m) above roofing level unless otherwise accepted in writing by the Owner's Representative and PVC/KEE Manufacturer's Technical Department.
- E. All flashings that exceed 30 inches (0.75 m) in height shall receive additional securement. Consult PVC/KEE manufacturer for securement methods.
- F. All PVC/KEE membrane flashings shall be mechanically fastened along the counter-flashed top edge with securement bar; fastened 6-8 inches on center. Seal the top edge and backside of the membrane flashing with Multi-Purpose Sealing Tape and approved sealant. Complete termination per manufacturer's requirements. Provide a metal counterflashing to protect the sealant and multi-purpose sealant tape.
- G. Only an area, which can be completely covered in the same day's operations, shall be flashed.
- H. Daily test lap edges with probe to verify seam weld continuity of all membrane flashings.
- I. Complete all membrane flashing and metal flashing details daily. If any water is allowed to enter under the completed roofing due to incomplete flashings, the affected area shall be removed and replaced at the Applicator's expense.

3.6 PVC/KEE COATED CLAD PERIMETER AND METAL BASE FLASHINGS

- A. General: All flashings shall be installed concurrently with the roofing membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and the manufacturer. Acceptance shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing due to incomplete flashings, the affected area shall be removed and replaced at the Applicator's expense.
- B. PVC/KEE coated metal flashings, shall be formed to match existing conditions and installed per the Detail Drawings.

- C. PVC/KEE coated metal shall be installed to provide adequate resistance to bending and allow for normal thermal expansion and contraction.
- D. Install Multi-purpose sealant tape and termination bar as indicated on project details. The Multi-purpose sealant tape must be applied to clean and dry surfaces.
- E. Secure the PVC/KEE coated metal over the PVC/KEE field membrane and the multi-purpose sealant tape. Fastened the PVC/KEE coated metal with approved stainless steel nails or other acceptable fastener. Fasteners shall be fastened 4 inches on center and staggered 4 inches on center.
- F. Adjacent sheets of PVC/KEE coated metal shall be spaced ¼ inch (6 mm) apart. The joint shall be covered with 2-inch (50-mm) wide aluminum tape. A 4-inch minimum wide strip of PVC/KEE membrane flashing membrane shall be hot air welded over the joint. Check all cover-strip welds with a rounded screwdriver prior to installation of eight-inch cover-strip. Re-weld any inconsistencies before eight-inch cover-strip installation.
- G. An 8-inch minimum wide strip of the 60 mil PVC/KEE membrane flashing shall be hot air welded to the 4-inch wide flange of the PVC/KEE coated metal and to the field membrane. Check all cover-strip welds with a rounded screwdriver. Re-weld any inconsistencies.

3.7 FIELD QUALITY CONTROL

- A. Roofing Applicator: The contractor shall make On-site evaluation of welded seams to locations as directed by the owner's representative or PVC/KEE manufacturer's technical representative. Two-inch wide cross-sections samples shall be taken three times a day minimum through completed seams. Correct welds shall display failure from shearing the membrane prior to separation of weld. The contractor at no extra charge to owner shall patch each test cut. Test seam samples shall be label with locations of seam cut, date of seam cut, and retain for owner' representative or PVC/KEE manufacturer's technical representative for test cut inspections. At the close of project, all seam test cuts are to be submitted to the owner's representative for review.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion of the roofing project.
 - 1. All defects noted non-compliance with the specifications or the recommendations of the thermoplastic manufacturer should be itemized in a punch list. These items must be corrected immediately by the contractor to the satisfaction of the owner's representative and the PVC/KEE Manufacturer.
 - 2. A copy of Final Inspection Report shall be sent to the Owner's Representative within two days after date inspection(s) is performed.

3.8 MANUFACTURER'S FIELD SERVICES

- A. Provide manufacturer's field services under provisions of the appropriate Division 01 Section.
- B. Require site attendance of roofing materials manufacturer's representative during installation of Work.
 - 1. Minimum of two (2) visits to project site each month during critical stages of installation with one visit coinciding with the monthly pay application meeting.

2. Schedule visits to coincide with visits by Architect including each monthly pay application meeting.

3.9 PROTECTION AND CLEANING

- A. Protect sheet membrane roofing from damage and wear during the construction period. Installer is to inspect the completed roofing system for any damage and repair damages found in the roofing system.
- B. Correct deficiencies in or remove roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair sheet flashings to a condition free of damage and deterioration at the time of Substantial Completion and per warranty requirements.
- C. Upon completion of the Work of this Section, dispose of, away from the Site, all debris, trash, containers, residue, roofing remnants and scraps.
- D. Remove all bituminous markings and stains from the finished membrane surface.
- E. The completed Roof shall be washed with water and approved cleaner to remove all dirt and residue from roof membrane.

3.10 TEMPORARY CUT-OFF AND PROTECTION

- A. All flashings shall be installed concurrently with the membrane in order to maintain a watertight condition as the work progresses. When a break in the day's work occurs in the installation of the roofing system, the roofing contractor shall install a temporary watertight seal. The roofing membrane shall be sealed to the substrate so that water will not be allowed to travel into or under the new or existing Roofing. When work resumes, the contaminated membrane shall be removed from the work area and disposed off site. None of these materials shall be reused in the new work.
- B. If inclement weather occurs while a temporary water stop is in place, the contractor shall provide the labor and materials to monitor the temporary water stop and to maintain a watertight condition at all times.
- C. If any water is allowed to enter under the newly-completed Roofing, the affected area shall be removed and replaced at the contractor's expense.
- D. Protect finished Work under provisions of the appropriate Division 01 Section.
- E. Where traffic must continue over finished roof installation, protect surfaces.

END OF SECTION 07 5400