

ADDENDUM NO. 4

Date July 27, 2026

City of Austin

Project Name: Hornsby Bend Biosolids Management Plant Headworks Improvements

C.I.P. No. 3164.075 IFB No.: 6100 CLMC1170

This Addendum forms a part of the Contract and corrects or modifies original Bid Documents, issued on June 15, 2026. **Acknowledge receipt of this addendum in space provided on bid form.** Failure to do so may subject bidder to disqualification.

A. Project Manual Revisions:

1) **Table of Contents, 01015 Construction Coordination and Sequencing**

DELETE date

"03/05/2026"

and REPLACE it with

"7/27/2026"

2) **Table of Contents: after Section 07211, add the following:**

07542 7/27/2026 Thermoplastic Polyolefin (TPO) Roofing

07555 7/27/2026 Fluid Applied Roof Coatings

3) **Section 01015 Construction Coordination and Sequencing**

Replace section in its entirety with attached section.

4) **Section 07542 Thermoplastic Polyolefin (TPO) Roofing**

Add section in its entirety with attached section.

5) **Section 07555 Fluid Applied Roof Coatings**

Add section in its entirety with attached section.

B. Drawing Revisions:

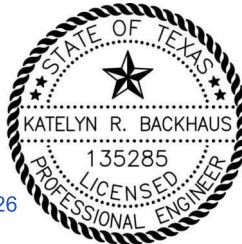
- 1) **Drawing C-5:** Replace with attached drawing.
- 2) **Drawing C-7:** Replace with attached drawing.
- 3) **Drawing C-8:** Replace with attached drawing.
- 4) **Drawing C-14:** Replace with attached drawing.
- 5) **Drawing M-4:** Replace with attached drawing.
- 6) **Drawing M-5:** Replace with attached drawing.
- 7) **Drawing M-6:** Replace with attached drawing.

This addendum consists of 38 page(s)/sheet(s).

Jules Parrish

Digitally signed by Jules Parrish
DN: C=US, E=jules.parrish@austintexas.gov,
O=City of Austin, OU=Capital Delivery
Services, CN=Jules Parrish
Date: 2026.07.28 11:07:27-05'00'

Approved by OWNER



7/27/2026

Katelyn R. Backhaus

Approved by ENGINEER/ARCHITECT (as applicable per license requirements)

END

SECTION 01015

CONSTRUCTION COORDINATION AND SEQUENCING

PART 1 GENERAL

1.01 SCOPE

- A. The Hornsby Bend Biosolids Management Plant (BMP) Headworks is a critical component of the Hornsby Bend BMP treatment process. Any disruption to the existing Headworks' ability to screen sludge will negatively impact the entire plant process. It is imperative that this project remain on schedule and select operations discussed herein remain in operation during construction.
- B. The OWNER and ENGINEER have attempted herein to define operational constraints, provide parameters to consider in the CONTRACTOR's baseline progress schedule, and to provide the CONTRACTOR with sufficient information to best ensure completion in a structured progression to allow sufficient time to complete construction activities.
- C. The OWNER's continuous and unimpeded operation of the plant is of higher priority than construction activities. Schedules of connections, renovations and modifications shall be submitted to the OWNER for approval, and all such items shall be coordinated throughout the entire construction period. The OWNER reserves the right to halt construction and /or instruct the CONTRACTOR to place facilities out of service for construction back into service if necessary to maintain regulatory compliance.
- D. The CONTRACTOR shall not operate any valves, gates or equipment unless directed to do so by the OWNER. The CONTRACTOR shall schedule all valve or gate closures with the OWNER. Existing valves and gates should be expected to not seal completely or properly. The CONTRACTOR shall provide any temporary containment required to perform the work, at no additional cost to the OWNER.
- E. The CONTRACTOR shall not interrupt or remove power or communication from any facility or equipment unless directed to do so by the OWNER. The CONTRACTOR shall schedule all outages and interruptions with the OWNER. Existing switchgear, switchboards, motor control centers, panelboards, overcurrent protective devices, and control panels should be expected to fail and require the CONTRACTOR'S immediate action to return to service.
- F. The CONTRACTOR's proposed construction sequencing plan shall be integral to their Baseline Schedule to the OWNER and ENGINEER to be submitted in accordance with Section 00700, paragraph 2.4.2.1.

1.02 RELATED WORK AND SPECIFICATIONS

- A. Section 00020 – Invitation for Bids
- B. Section 00700 – General Provisions
- C. Section 00810 – Supplemental Conditions

- D. Section 00900 – Addenda
- E. Section 01010 – Summary of Work
- F. Section 01300 – Submittals
- G. Section 01650 – General Requirements for Equipment Commissioning Testing & Startup
- H. Section 16010 – Electrical General Provisions
- I. Section 16030 – Selective Demolition for Electrical

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SHUTDOWN PROCEDURES

- A. Regardless of the requirements outlined herein, shutdown of any process, including power and control systems, at the plant requires close coordination and planning with the OWNER and plant superintendent. The CONTRACTOR shall comply with the operational constraints of the plant during the shutdowns.
- B. This work at the Hornsby Bend BMP Headworks may be concurrent with other work at the plant. Plant outages at Hornsby Bend BMP or other facilities will be coordinated by the OWNER and ENGINEER. In case of conflicts in scheduling work requiring shutdowns or partial outages at multiple facilities, the OWNER will determine which treatment process shutdowns will be delayed.
- C. The CONTRACTOR shall perform all work activities to accommodate normal plant operations with only pre-planned and OWNER approved process interruptions necessary for process unit isolation, process piping, and electrical connections.
- D. The Plant process cannot be interrupted for an extended period of time during any portion of this project. The Headworks process can be offline for no longer than eight (8) hours, once every two (2) weeks (fourteen calendar days). Such instances shall be coordinated between the CONTRACTOR and the OWNER and shall be referred to as "shutdown(s)" herein.
- E. The CONTRACTOR shall notify the OWNER in writing at least twenty-one (21) days in advance and again three (3) days prior to each shutdown, and coordinate with the OWNER the specific items to be isolated and the duration for each. The CONTRACTOR shall obtain written approval from the OWNER prior to each shutdown. Emergency work may be accomplished without obtaining prior permission; however, the CONTRACTOR shall notify onsite operators, OWNER and ENGINEER immediately of any emergencies.
- F. At least twenty-one (21) calendar days prior to planned shutdowns, the CONTRACTOR shall submit to the OWNER for review and approval:
 - 1. A detailed description of the work to be performed.

2. A schedule outlining the duration of each scheduled task and total duration of the shutdown, not to exceed eight (8) hours. Shutdowns shall be scheduled for Tuesday, Wednesday, or Thursday and shall not be scheduled the same week as a City-observed holiday. Weather conditions shall be taken into consideration when scheduling shutdowns.
 3. A list of all equipment and materials required to complete each task.
 4. Documentation that all manpower, equipment and materials necessary to complete each task are available on site.
 5. Emergency plan to take place should an emergency occur during the scheduled duration.
 6. Backup plan, in case during the shutdown the work cannot be completed as planned.
- G. Depending on duration of outage and time of year, AW may need to coordinate on the City's concurrence process. Contractor shall provide supporting documentation as necessary for plant engineer and operators to sufficiently execute the concurrence process.
- H. A minimum of two (2) working days prior to the scheduled shutdown, a special coordination meeting will be held with the CONTRACTOR, OWNER, ENGINEER, Subcontractors and other parties as requested by the OWNER or ENGINEER to review procedures.
- I. Prior to a shutdown and beginning work, the Contractor shall have on-site all materials, equipment and personnel necessary to complete the work in the time scheduled. The CONTRACTOR shall also perform all tasks to the most complete state possible prior to shutdowns.
- J. The OWNER's plant manager and/or their designee shall be responsible for directing shutdown operations. The CONTRACTOR shall provide any labor assistance necessary to complete shutdown operations including but not limited to:
1. Operating gates and valves (under direction and supervision of the OWNER's plant operating staff).
 2. Removing sludge, scale, mud and debris from pipelines. Materials and fluids removed from pipelines shall be taken offsite and disposed according to TCEQ regulations and shall be the sole responsibility of the CONTRACTOR.
 3. Containing, pumping and conveying water that may leak through existing gates and valves. Water shall be pumped and conveyed to the Thickener Complex Lift Station.
 4. Restoring power and controls that may have been inadvertently removed from facilities and equipment during construction.
- K. In the case of failure of the CONTRACTOR to perform the work in the planned shutdown time, the CONTRACTOR may be liable for payment of costs associated with the interruption of the wastewater treatment process.

3.02 ANTICIPATED SHUTDOWNS

- A. The ENGINEER has identified the following construction activities that will require complete shutdown or partial shutdowns of the Headworks and other processes:
 - 1. Complete Process Shutdowns
 - a. MS-1 Electrical preventative maintenance and manufacturer measurement for equipment modification
 - b. Modification of MS-1 to provide feeders for new CoGen Switchgear
 - c. Connection of MS-1 to new service disconnect
 - d. Cable connection from new CoGen Switchgear to existing Govalle and SAR MCC feeders within a junction box.
 - e. Load transfer for FEB sludge transfer pumps, tank mixer, basement sump pumps, and grinder as noted in 3.04.
 - f. Replacement of FEB PLC.
 - 2. Isolated Equipment Shutdowns
 - a. Transfer of power serving existing loads from existing power distribution equipment to new power distribution equipment.

3.03 SPECIFIC CONSTRUCTION ACTIVITIES SEQUENCING

The following sequences are for information only and are intended to represent a general sequence of construction of major activities in which the Work can proceed. The sequences provided below are not intended to represent a complete work plan. The CONTRACTOR is not obligated to follow the sequences as set forth below; however, the plan submitted shall conform to the construction constraints specified herein. All partial shutdowns or diversions must be previously approved by the OWNER and ENGINEER.

- A. CONTRACTOR to keep the existing facilities operational during construction of the new facilities. CONTRACTOR shall not disconnect process-mechanical or electrical components until new facilities are fully commissioned.
- B. The temporary thickening system shall be modified prior to construction of the new headworks. CONTRACTOR shall coordinate with the Owner regarding sequencing of modification of temporary thickening system. Owner will confirm items to be salvaged and returned to Owner. Refer to Section 01020 Allowances.
- C. Electrical Sequencing
 - 1. Set in place all new electrical infrastructure required for the proposed power distribution system, including all switchgear, motor control centers, junction boxes, conduits, cables, and conductors to new and existing loads to remain (DO NOT TERMINATE).
 - a. CoGen Building Electrical Sequencing
 - (i) Install a new service disconnect on the outside of the CoGen building
 - (ii) Install new CoGen switchgear within building
 - (iii) Install cable and conduit between service disconnect and CoGen switchgear
 - (iv) Install conduit between MS-1 and new service disconnect

- (v) Install conduit between new CoGen switchgear and old CoGen switchgear
 - (vi) Coordinate with Austin Energy to de-energize utility transformer
 - (vii) Install cable between MS-1 and new service disconnect
 - (viii) Install cable between new Cogen switchgear and existing CoGen switchgear
 - b. FEB Building Electrical Sequencing
 - (i) Build the new electrical room and install new MCCs while the existing FEB power and controls remains operational
 - (ii) Install conduit between existing motors and new FEB MCCs
 - 2. Test proposed distribution equipment.
 - 3. Transfer loads from existing distribution equipment to proposed distribution equipment.
 - a. Both sets of equipment (new and existing) are to remain energized and loads are to be transferred one at a time. Refer to electrical load transfer constraints as outlined in section 3.04.
 - b. Transferring existing loads from the existing to the new power distribution system shall be limited to four (4) hours per load.
 - c. Note that temporary controls may be required and/or control system modifications will be required for transfer of loads from existing MCC's to new MCCs.
 - 4. Splice existing feeds to GoValle and SAR Complexes using existing CoGen switchgear as junction box.
 - 5. Demolish existing electrical equipment per the constraints noted herein.
- D. Instrumentation and Control Sequencing: LPU-1A and LPU-5 Replacement
- 1. Coordinate with plant operations staff, City SCADA, City IT department, and City SCADA Programming Engineer to develop replacement plan.
 - 2. Provide replacement plan submittal to Austin Water and Engineer for review and approval for both replacements:
 - a. LPU-1A replacement with HBD-FEB-CONTROLPANEL-01
 - b. LPU-5 replacement with HBD-COGEN-CONTROLPANEL-01
 - 3. Before replacement work commences, ensure all connected process loads can be manually/locally operated with the associated unit offline.
 - a. LPU-1A may only be down for one (1) week.
 - 4. Coordinate with Austin Water SCADA and City IT department for any network impact during the replacement work.
 - 5. Trace each panel field wire and identify each wire function. Provide City standard wire tag label for each reused wire. This includes network cable, both fiber optic and CAT6 cable.
 - 6. Install new panels in place. Connect all network cables and test. Make sure there is no issue on network communication for both SCADA network and City network.
 - 7. Test each field wire and equipment function with City SCADA Programming Engineer on the PLC program. Document each test result and submit test report to the Owner.
 - 8. Disconnect all field wires. Remove the existing panel.

9. Schedule the Operational Readiness Test.
10. Update panel wiring on the panel drawing. Provide O&M submittal.
11. The total of panel replacement shall be completed in three (3) days.

3.04 CONSTRUCTION CONSTRAINTS

A. General

1. The CONTRACTOR shall not disconnect power from any sources unless directed to do so by the OWNER.
2. The CONTRACTOR shall maintain access to all plant facilities at all times for plant personnel, chemical delivery and emergency vehicles.
3. The CONTRACTOR shall provide safe, continuous access to process control equipment for plant operations personnel.
4. For removal and replacement of equipment or appurtenances during construction, all replacement equipment and appurtenances must be on site and prepared for installation prior to any demolition activities.
5. Prior to demolition activities, CONTRACTOR shall confirm items to be salvaged and returned to Owner.
6. The CONTRACTOR shall maintain access to plant roads and entrances.
7. The CONTRACTOR shall coordinate with the Owner if additional staging or storage area is necessary outside of the limits shown on the Drawings.
8. The CONTRACTOR shall maintain adequate drainage for the duration of the project. Temporary drainage may be required after the demolition of the existing storm inlet and before the construction of the proposed inlet and storm drain.

B. Existing Subgrade Utilities

1. The CONTRACTOR is responsible for verifying all existing electrical/mechanical/etc. underground utilities/systems whether shown in the Drawings or not at no additional cost to the Owner. The information shown in the Drawings shall not relieve the CONTRACTOR of the responsibility of confirming or finding the existing underground utilities/systems.
2. The CONTRACTOR must exercise extreme care as there are not reliable as-built records identifying the routing of underground utilities/systems and there was minimal subsurface investigation performed before bid.
3. The CONTRACTOR shall be responsible for providing all necessary materials and labor to adequately support existing underground utilities/systems exposed during excavation/construction activities in a manner that will maintain the integrity of the exposed underground utility/system and prevent possible damage to and/or interruption of the utility/system and/or facility/plant operation at no additional cost to the Owner.

C. Contaminated Soils

1. CONTRACTOR shall monitor excavated material and groundwater for contamination and notify owner immediately if contamination is detected. If CONTRACTOR or Owner's Representative detects contamination in excavated material, work in the area shall stop and CONTRACTOR and OWNER shall coordinate per the requirements of Section 01901 – Contaminated Soil and Groundwater.

D. Utilities

1. Provide advance notice to and utilize the services of Texas Excavation Safety System (Texas 811) for location and marking of underground utilities operated by utility agencies other than the OWNER.
2. Maintain electrical, telephone, water, gas, sanitary facilities and other utilities within the existing facility in service. Provide temporary utilities when necessary.
3. New yard utilities were designed using existing facility drawings.
 - a. Field verification of utilities locations was not performed during design.
 - b. Services crossed or located nearby new yard utilities may require relocation and possible shutdowns.
 - c. Pipe alignments as indicated on the Drawings.

E. Influent Pipe Tie-In

1. The CONTRACTOR shall coordinate with the owner for the tie-in to the existing influent piping. As noted on Drawing C-5, Contractor shall provide six (6) plug valves at the influent connections (two per connection) to provide diversion of flows between existing and new headworks for construction sequencing. Refer to 15116 – Plug Valves for valve submittal, installation, and testing requirements. Provide valve box, lid, and required backfill as noted in City Standard Detail 511-AW-01 for each valve.
2. The CONTRACTOR is to provide temporary bypass piping to the existing headworks during the construction of the proposed influent piping until the new Headworks is operational at no additional cost to the Owner.
 - a. Sidestream Influent Sludge Line
 - (i) Diameter is 10" routed to the Headworks area and reduced to 8" before the above-grade feed manifold.
 - (ii) Typical flow rate is approximately 170 gpm.
 - b. SAR WWTP Influent Sludge Line
 - (i) Diameter is 12" routed to Hornsby, reduced to 10" east of the Headworks facility underground, and then reduced to 8" before the above-grade feed manifold.
 - (ii) Typical flow rate can be up to 1000 gpm
 - c. Walnut Creek WWTP Influent Sludge Line
 - (i) Diameter is 12" routed to Hornsby, reduced to 10" east of the Headworks facility underground, and then reduced to 8" before the above-grade feed manifold
 - (ii) Typical flow rate can be up to 1000 gpm.
3. The existing headworks and associated influent pipes to remain in service until the Owner's acceptance of the proposed/new headworks and its influent piping. For bypass piping tie-ins, existing lines may be taken out of service for the durations listed below. No more than one line can be taken out of service at one time. Should the lines need to be taken out of service for longer than the durations listed below, the CONTRACTOR shall provide appropriate bypassing pumping or other Owner/Engineer accepted means to meet the above flows at no additional cost to the Owner.
 - a. The Sidestream influent sludge line can be out of service for up to 8 hours.

- b. The SAR WWTP influent sludge can be out of service for up to 4 hours.
- c. The Walnut Creek WWTP influent sludge line can be out of service for up to 4 hours; however, dependent on concurrent work at Walnut Creek WWTP, this line may be subject to a shorter out of service timeframe.

F. Flow Equalization Basin (FEB) Penetrations

- 1. For construction of new penetrations and infill of existing penetrations, CONTRACTOR shall exercise extreme caution in the FEB.
- 2. CONTRACTOR shall provide ventilation during work requiring occupation of the FEB.
- 3. CONTRACTOR shall provide a means to keep construction materials from falling into FEB.
- 4. CONTRACTOR shall coordinate with plant to lower FEB working level as needed to complete the work. CONTRACTOR may choose to bypass the FEB to perform the work (at no additional cost to the Owner).

G. Electrical Load Transfer (Existing Equipment to Remain)

- 1. Provide adequate lighting in all areas during load transfer.
- 2. Provide adequate heating in all areas during load transfer.
- 3. CoGen air compressors can only be taken out of service one at a time.
- 4. FEB digester pumps can only be taken out of service one at a time.
- 5. FEB sludge transfer pumps, tank mixer, basement sump pumps, and grinder shall have load transfers completed at the same time during a planned process shutdown as noted above.
- 6. FEB odor control blowers can only be taken out of service one at a time.
 - a. FEB supply fans, exhaust fans, and condensing units cannot be taken out of service while either of the odor control blowers are out of service.

3.05 MEASUREMENT AND PAYMENT

- A. All work items installed, provided, constructed, etc. with the exception of the unit price items listed in Section 00300L – Bid Form (Lump Sum), shall not be paid for separately but shall be considered subsidiary to the lump sum bid price for the Project. The cost of all work materials, labor, overhead, insurance, equipment, etc. necessary to finish the work complete in place shall be included in the lump sum bid price for the project.

END OF SECTION

SECTION 07542

THERMOPLASTIC POLYOLEFIN (TPO) ROOFING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SCOPE OF WORK

- A. Scope of work is for the application of TPO Roofing Membrane and patching as necessary to provide a weather-tight roof at the COGEN Building. TPO and TPO patches are necessary due to the removal of existing roof top equipment, installation of new equipment, and to patch existing roof penetrations where existing pipe, conduit and other roof top appurtenances are indicated to be removed, and or where new pipe, conduit and other roof top appurtenances are indicated to be installed.

1.03 SUMMARY

- A. Section Includes:
 - 1. Adhered TPO membrane roofing system.
 - 2. Roof insulation.
 - 3. Insulation accessories and cover board.
- B. Related Sections:
 - 1. Division 06 Section "Rough Carpentry" for wood nailers, curbs, and blocking.
 - 2. Division 07 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counterflashings.
 - 3. Division 07 Section "Joint Sealants" for joint sealants, joint fillers, and joint preparation.

1.04 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Base flashings and membrane terminations.
 - 2. Tapered insulation, including slopes.
 - 3. Roof plan showing orientation of roof deck and orientation of membrane roofing and fastening spacings and patterns for mechanically fastened membrane roofing.
 - 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Samples for Verification: For the following products:
 - 1. Sheet roofing, of color specified, including T-shaped side and end lap seam.
- D. Qualification Data: For qualified Installer and manufacturer.

- E. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of compliance with performance requirements.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.
- G. Maintenance Data: For roofing system to include in maintenance manuals.
- H. Warranties: Sample of special warranties.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for membrane roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.
- C. Source Limitations: Obtain components including roof insulation fasteners for membrane roofing system from same manufacturer as membrane roofing or approved by membrane roofing manufacturer.
- D. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
- E. Preinstallation Roofing Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 - 5. Review structural loading limitations of roof deck during and after roofing.
 - 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 - 7. Review governing regulations and requirements for insurance and certificates if applicable.
 - 8. Review temporary protection requirements for roofing system during and after installation.

1.06 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, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation 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.

1.07 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.08 WARRANTY

- A. Special Warranty: Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, and other components of membrane roofing system.
 - 2. Warranty Period: 15 years from date of Substantial Completion.
- B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of membrane roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 PRODUCTS

1. PERFORMANCE REQUIREMENTS

- a. Accelerated Weathering: Roof membrane to withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
- b. Impact Resistance: Roof membrane to resist impact damage when tested according to ASTM D3746, ASTM D4272, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.

- c. Wind Uplift Resistance: Design roofing system to resist the following wind uplift pressures when tested according to FM Approvals 4474, UL 580, or UL 1897:
 - (i) Roof loading requirements are as indicated in the structural drawings.
- d. FM Approvals' RoofNav Listing: Roof membrane, base flashings, and component materials comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system, and are listed in FM Approvals' RoofNav for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals Certification markings.
 - (i) Fire/Windstorm Classification: Class 1A-120.
 - (ii) Hail-Resistance Rating: FM Global Property Loss Prevention Data Sheet 1-34 VSH.
- e. SPRI's Directory of Roof Assemblies Listing: Roof membrane, base flashings, and component materials comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system, and are listed in SPRI's Directory of Roof Assemblies for roof assembly identical for that specified for this Project.
 - (i) Wind Uplift Load Capacity: 120 psf.
- f. Energy Star Listing: Roofing system to be listed on the DOE's Energy Star "Roof Products Qualified Product List" for low slope roof products.
- g. Energy Performance: Roofing system to have an initial solar reflectance of not less than 0.70 and an emissivity of not less than 0.75 when tested in accordance with ANSI/CRRC S100.
- h. Exterior Fire-Test Exposure: ASTM E108 or UL 790, for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- i. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.02 TPO MEMBRANE ROOFING

- A. Fabric-Reinforced Thermoplastic Polyolefin Sheet: ASTM D 6878, internally fabric or scrim reinforced, uniform, flexible TPO sheet.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. GAF Materials Corporation.
 - b. Approved equal.
 - 2. Thickness: 80 mils, nominal.
 - 3. Exposed Face Color: White.

2.03 ACCESSORY ROOFING MATERIALS

- A. General: Accessory roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.
- B. Sheet Flashing: Manufacturer's standard unreinforced thermoplastic polyolefin sheet flashing, 55 mils thick, minimum, of same color as sheet membrane.
- C. Bonding Adhesive: Manufacturer's standard as required for specified wind uplift loading.

- D. Prefabricated Pipe Flashings: As recommended by the roof membrane manufacturer.
- E. Slip Sheet: Manufacturer's standard, of thickness required for application.
- F. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- G. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.
- H. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.04 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by TPO membrane roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
 - 1. Size: 48 by 48 inches.
 - 2. Thickness:
 - a. Match existing insulation layer thicknesses
- C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- D. Performance Requirements:
 - 1. To meet energy code compliance.
 - 2. Achieve R Value: R-25 or greater.

2.05 INSULATION ACCESSORIES

- A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
- C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
 - 1. Full-spread, spray applied, low-rise, two component urethane adhesive.
- D. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch thick. Fiberglass facer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 2. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
 - 3. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
 - 4. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. 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.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.03 INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation. Install base layer insulation with joints staggered not less than 12 inches in adjacent rows.
- C. Install insulation under area of roofing to achieve required thickness.
 - 1. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.
- D. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.

1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

3.04 ROOFING INSULATION INSTALLATION

A. Installation Over Metal Decks:

1. Install base layer of insulation with joints staggered not less than 24 inches in adjacent rows, and with long joints continuous at right angle to flutes of decking.
 - a. Locate end joints over crests of decking.
 - b. Where installing composite and non-composite insulation in two or more layers, install non-composite insulation for bottom layer and intermediate layers if applicable, and install composite board insulation for top layer.
 - c. Trim insulation to neatly fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - d. Make joints between adjacent insulation boards not more than 1/4 inch in width.
 - e. Fill gaps exceeding 1/4 inch with insulation.
 - f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
 - g. Mechanically attach base layer of insulation using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to metal decks.
 - (i) Fasten insulation according to requirements in FM Approvals RoofNav for specified Windstorm Resistance Classification.
 - (a) Refer to structural for loading.
 - (ii) Fasten insulation to resist specified uplift pressure at corners, perimeter and field of roof.
2. Install upper layers of insulation and tapered insulation with joints of each layer offset not less than 12 inches from previous layer of insulation.
 - a. Staggered end joints within each layer not less than 24 inches in adjacent rows.
 - b. Install with long joints continuous and with end joints staggered not less than 12 inches in adjacent rows.
 - c. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - d. Make joints between adjacent insulation boards not more than 1/4 inch in width.
 - e. Fill gaps exceeding 1/4 inch with insulation.
 - f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
 - g. Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

3.05 INSTALLATION OF COVER BOARDS

- #### A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.
1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 2. At internal roof drains, conform to slope of drain sump.
 - a. Trim cover board so that water flow is unrestricted.

- b. Cut and fit cover board tight to nailers, projections, and penetrations.
- c. Adhere cover board to substrate using adhesive according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - (i) Set cover board in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

3.06 INSTALLATION OF ADHERED ROOF MEMBRANE

- A. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll roof membrane and allow to relax before installing.
- C. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Bonding Adhesive: Apply to substrate and underside of roof membrane at rate required by manufacturer, and allow to partially dry before installing roof membrane. Do not apply to splice area of roof membrane.
- E. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and perimeter of roofing.
- F. Apply roof membrane with side laps shingled with slope of roof deck where possible.
- G. Seams: Clean seam areas, overlap roof membrane, and hot-air weld side and end laps of roof membrane and sheet flashings, to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roof membrane and sheet flashings.
 - 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.

3.07 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings.

3.08 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- B. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.

3.09 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements; repair substrates; and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 07555

FLUID APPLIED ROOF COATINGS

PART 1 EXECUTION

1.01 SCOPE OF WORK

- A. Scope of work is providing patches and repairs to the existing roofing system on the FEB building. Work will include but is not limited to the removal of existing roof hatches, pipe and or conduit penetrations no longer in use, removal or existing equipment, and patches where new equipment, pipe or conduit is indicated to be installed. Repairs will include concrete patches and repairs to the existing concrete deck prior to the application of the Fluid Applied Roof Coating.
 - 1. Feathering of new fluid applied roof coatings is required where new product will meet existing roof coatings to eliminate hard edges in the liquid coating and provide better adhesion to prevent peeling or lifting at sharp boundaries.
- B. Contractor will provide all labor and equipment necessary to install a 100% Silicone Roof Coating System.
- C. Product Data Sheets and installation instructions shall be followed in conjunction with this specification.
- D. Coverage rates indicated in this specification Do Not include calculations for waste. When installing liquid products, the contractor must include a waste factor when calculating quantities of material necessary to meet the project requirements.
- E. Contractor is solely responsible to complete all necessary repairs to the existing concrete deck to restore it to a structurally sound, watertight condition prior to installing the 100% Silicone Roof Coating System.

1.02 RELATED SECTIONS

- A. Related sections may or may not be applicable to this specification.

1.03 REFERENCES

- A. ASTM D6694 Standard Specification for Liquid-Applied Silicone Coating
- B. NRCA Roofing and Waterproofing Manual
- C. Underwriters Laboratories Building Materials Directory
- D. CRRC (Cool Roof Ratings Council)

1.04 SUBMITTALS

- A. Submit Product Data Sheets (PDS) confirming physical and performance properties of each product used in the system.

- B. Submit Safety Data Sheets (SDS) for each product used in the system.
- C. Submit a roof survey including roof type, measurements and descriptions of the condition of the seams, penetrations, drains, gutters, known leaks and a moisture scan or test cuts with an indication of moisture content. Photographs of all conditions should be included in the submission.
- D. Submit a sample copy of the requested warranty type.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall provide a roofing system that meets or exceeds the criteria listed in this section.
- B. Contractor must be a Manufacturer Eligible Contractor approved for the installation of the products utilized in this system specification.
- C. Supplier shall retain batch samples of all coating products used in the system for a minimum of 5 years.
- D. Prior to work commencing, the Contractor shall submit a fully completed Silicone Roof Coating System Warranty Application to the Manufacturer Technical Department. Included shall be an accurately dimensioned roof drawing plus photos of any unusual flashing details or roof conditions.
- E. Contractor shall furnish all insurance, licenses, permits and certifications as required by local authorities and/or the property owner.
- F. Contractor shall ensure that all work performed at the site shall be in accordance with National Roofing Contractors Association (NRCA) Low Slope Roofing Manual recommendations and all other pertinent guidelines issued by the NRCA in reference to other types of construction present at the job site.

1.06 DELIVERY, STORAGE AND HANDLING

- A. All products delivered to the job site shall be in their original unopened containers or wrappings and clearly labeled with the manufacturer's name, product identification and date of manufacture.
- B. Store all materials in a dry, clean area protected from the elements and damage. Place all stored materials on pallets and cover with a tarpaulin. Keep out of direct contact with sunlight.
- C. All liquid products and caulks shall be stored at temperatures between 60°F and 80°F. Materials exposed to lower temperatures affect the workability and performance of the product. Products shall be restored to the above temperature prior to use.
- D. All flammable materials shall be stored in a cool, dry area away from open flames and sparks. Follow precautions outlined on containers or supplied by the material manufacturer/supplier.

- E. All materials determined as being damaged due to improper storage on the job site are to be replaced with new materials.

1.07 JOB CONDITIONS

- A. The roof must be structurally sound, clean, dry and free of areas of ponding water, ice, snow, rain or dew, oils, grease, particulate matter or other debris.
- B. Roof must be inspected for the following existing conditions:
 - 1. Spalled, damaged or loose substrate
 - 2. Peeling and chalking of previous coatings
 - 3. Poorly attached vents or other projections
 - 4. Areas of ponding water – areas of dirt/debris accumulation
 - 5. Broken or improperly flashed pipes
 - 6. Broken or missing drain components
 - 7. Loose or damaged perimeter edge metal
- C. All deficiencies including all sources of leaks must be properly corrected prior to the installation of patches of the new Silicone Roof Coating System.
- D. The contractor shall follow and comply with all safety regulations as recommended by OSHA.
- E. Any unusual or concealed condition discovered during the preparation of the existing roof surface or installation of the Silicone Roof Coating System is to be reported to the Owner, Architect and Supplier immediately in writing. Work is to be halted until the owner has responded with a solution to the problems.
- F. All local building codes and requirements should be followed where applicable. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.
- G. All air intake ventilation equipment should be shut off and all ductwork openings should be temporarily sealed during product application.

1.08 PRECAUTIONS

- A. Coatings may require mixing immediately prior to application. If mixing is required, mix at low speed to avoid entraining air into the coating. Coatings shall be mixed no more than 1 (one) hour prior to use.
- B. This product cures through absorption of moisture from the air. Avoid entraining air when mixing. Do not mix at high speeds.
- C. Remixing of 100% Silicone Roof Coating is permitted as necessary.
- D. Remixing of 2-Part Epoxy Primer after expiration of its pot life is not permitted.
- E. No products with a "Flash Point" below 100°F shall be permitted due to associated fire hazard.

- F. No products with chlorinated "Toxic Exempt" solvents including perchloroethylene, 111 trichloroethane or methylene chloride or isocyanates shall be utilized due to the associated health hazards to workers and building occupants.
- G. No asphalt or vegetable-based oils may be used in the production of any product included in this specification.
- H. Materials should be maintained at a minimum temperature of 50°F for 24 hours prior to the application to ensure the optimal application qualities.
- I. Do not apply coating when ambient temperature is within 5°F of the dew point.
- J. Do not apply coatings during or just before rain, inclement weather or on frost covered or wet surfaces.
- K. The concrete deck surface must be a minimum of 35°F to ensure that frozen condensation is not present on the roof surface.
- L. The concrete deck surface should not exceed a maximum of 100°F to avoid blisters and pinholes.
- M. Do not apply to concrete decks that may be subject to vapor drive from conditioned spaces below.

1.09 PROTECTION OF BUILDINGS AND ADJACENT AREAS

- A. It is the sole responsibility of the installing contractor to protect all surfaces adjacent to the surfaces to be coated including but not limited to, windows, doors, equipment and wall surfaces, either from overspray, brushing or rolling of the coatings being installed.
- B. All roof top air intake equipment should be turned off and all openings should be sealed to prevent any fumes from entering the building.
- C. When spraying, parking lots adjoining the building should be blocked off sufficiently to protect vehicles from wind borne overspray.

1.10 WARRANTIES

- A. Roof Coatings Warranty Application forms must be fully completed and submitted to the Manufacturer Technical Department prior to beginning the project. Issuance of a warranty will be dependent upon completion of the project to the satisfaction of Manufacturer and payment of any required warranty fees.
- B. Manufacturer Roof Coatings System warranties require the following minimum application rates:

Warranty Type	Cleaner	Primer	100% Silicone Roof Coating
15-year	Clean with 115 Cleaner applied with low pressure sprayer then power washed.	If priming, use 1 coat of Multibase SB @ 1.5 gal/100 sf minimum	1 coat @ 2.0 gal/100 sf (32 wet mils, 31 dry mils)

Note: Minimum application rates listed do not include thickness of primers or areas where additional coatings and reinforcement are required.

PART 2 PRODUCTS

2.01 GENERAL

- A. Subject to compliance with requirements, provide Mule-Hide Silicone Roof Coating System and products manufactured or supplied by Mule-Hide Products Co., Inc., or approved equal.
- B. Components other than those supplied or manufactured by Mule-Hide may be submitted for review and acceptance by Mule-Hide's Technical Department. Any product requested for review and acceptance must be submitted prior to the job start. Mule-Hide's acceptance of any other product is based solely on chemical compatibility and published performance data provided by the component manufacturer. Other components may be considered on a job-by-job basis and must be approved in writing by Mule-Hide's Technical Department. Mule-Hide offers no warranty or guarantee for the performance or suitability of any component not supplied or manufactured by Mule-Hide.

2.02 PRODUCTS

- A. The following Mule-Hide materials must be used to install Mule-Hide Silicone Roof Coating Systems. Mule-Hide will not warrant any application where another manufacturer's product is substituted for a Mule-Hide product. All products listed below are physically and chemically compatible with each other.
 1. 115 Cleaner – a biodegradable detergent wash suitable for cleaning and preparing metal and aged roof surfaces (including but not limited to smooth BUR, modified bitumen, EPDM, TPO, Hypalon (CSPE) and PVC roof systems).
 2. Multibase SB – a one-component acrylic coating used as primer for granulated and smooth modified surfaces. The application rate is 1.5 gal/100 sf for smooth and granulated surfaces.
 3. 100% Silicone Sealant – a high solids, moisture-cure silicone sealant intended for sealing joints in masonry, architectural metal, metal roof seams and fasteners and miscellaneous repairs prior to coating.
 4. 100% Silicone Roof Coating - This product is a 100% silicone based, single-component roof coating that creates a barrier that is resistant to normal weathering, is durable, breathable and weatherproof. This product meets or exceeds the requirements of ASTM D6694. Refer to the Mule-Hide Product Data Sheets for physical properties and additional information.
 5. JTS-1 Joint & Termination Sealant - is a fast curing, 100% solids, non-shrink, performance sealant for use in multiple types of construction where significant movement or vibration is expected. Ideal for roof terminations and expansion joints.

Sealant has excellent adhesions to concrete, masonry, EPDM, PVC, wood, vinyl and most other common building materials.

6. Seal-Fast Liqui-Flash - is a single component, non-shrink, advanced technology polyurethane sealant designed for filling and sealing pitch pockets and pans, metal roof seams & fasteners, inlaid gutters, polyurethane foam, aged smooth asphalt and modified bitumen and aged PVC and EPDM roofs.
7. MP Liquid Sealant – a single component, non-shrink, polyurethane sealant used for filling/topping pitch pans.
8. ShapeShift Pitch Pans – high-strength polymer straight and outside corner sections that snap-lock together to create custom sized pitch pans to seal around various roof penetrations.
9. Walkway Granules – Mule-Hide Walkways granules are colored EPDM granules available in gray or safety yellow used with the 100% Silicone Roof Coating to provide a non-slip surface over a Mule-Hide Silicone Roof Coating System in areas of foot traffic or service areas.
10. Tietex® 325 Poly Fabric – a stitch-bonded polyester product that offers high-strength properties with good elongation for excellent thermal stress force accommodations. Tietex 325 Poly Fabric is a soft polyester that will readily conform to surface irregularities and is easy to handle.

2.03 EQUIPMENT

- A. Spray Equipment (optional) – Mule-Hide recommends the Graco GH 933ES Hi-Flo Big Rig sprayer with a Monarch 5:1 pump, 3/4" material hose (7,250 psi) up to 250 ft., 1/2" whip, XHF spray gun (7,250 psi) with a XDF 7,250 psi tip (.029 - .035). The recommended pressure at the gun should be 3,000 psi while spraying (Note: Pump lower must be set to maximum lower-ball travel). Please contact Mule-Hide Technical Department for more detailed information.
 1. Note: Use of the Monarch pump requires the use of an air compressor capable of delivering 20CFM @ 90 psi.
- B. Miscellaneous equipment includes 3/4" to 1-1/4" nap, lint free, 9" roller covers and rollers, 6' handles, 4" double wide chip brushes, roofers' trowels, scissors for cutting fabric and a 1/2" power drill with mixing attachment.
- C. Miscellaneous hand and power tools may be required to complete any repairs to the existing roof.

PART 3 PART 3 EXECUTION

3.01 EXAMINATION

- A. Prior to bidding the project a pre-inspection of the roof should take place with the Warranty Eligible Contractor and a Mule-Hide representative to review the conditions of the roof and determine if the roof is suitable for the application of a Mule-Hide Silicone Roof Coating System.
- B. Adhesion Tests

1. The decision to perform adhesion tests should be determined at the time of the pre-inspection. Any metal roof systems having an existing coating covering the roof surface shall be required to have adhesion tests performed. While adhesion tests are not always needed when coating a bare metal roof, they are required when the metal panels are pre-painted or are covered with an existing coating applied that will not be removed. While there is no actual ASTM test method for field testing of adhesion for roof coatings, many manufacturers will reference ATSM D903 or ASTM D3359. Mule-Hide follows ASTM D903 and ASTM D6083 with modifications.
2. When an adhesion test is needed follow the procedure outlined in Mule-Hide Technical Bulletin 1803, Roof Coating Adhesion Test and submit the test results to the Mule-Hide Technical Department for review and comment.

3.02 EXISTING CONDITIONS AND REMEDIES

- A. Prior to the commencement of work, the deck shall be re-inspected and any conditions not included in the roof survey shall be added and noted. All new information must be communicated to the Mule-Hide prior to starting work.
- B. The deck assembly must be structurally sound and free of damaged concrete. Defects shall be remedied prior to the installation of the Silicone Roof Coating System.
- C. Drains are recommended to be installed to allow positive drainage of the deck surface. Retained water may not cover more than 5% of the deck surface. If it is not possible to install drains, areas of light ponding (must evaporate within 48 hours as defined by the NRCA) may be addressed by use of an approved, compatible cementitious filler/leveling compound prior to application of the Silicone Roof Coating System. Any areas where ponding remains beyond 48 hours shall require an increased rate of at least 1(one) additional gallon per 100 sf.
- D. Existing flashings shall be properly terminated according to NRCA guidelines or the original membrane manufacturer's specifications. Defective terminations shall be remedied. Damaged flashings shall be repaired prior to installation of the Silicone Roof Coating System.
- E. Curbs and penetrations must not interrupt the flow of water off the roof. If defects are present, install crickets to divert water around the penetrations.
- F. If the existing deck surface has been previously coated, adhesion tests must be performed. See Section 3.1.B. Adhesion Tests.
- G. If the existing deck surface contains aluminum coating, pressure wash the substrate, utilizing the 115 Cleaner as needed, to remove the loose aluminum flakes from the substrate. A change in color from silver to bronze will occur when the loose aluminum has been sufficiently removed. When the surface can be wiped or touched and no aluminum dust remains, the surface is sufficiently prepared to accept the Silicone Roof Coating System.
- H. If the existing deck surface has been coated with asphalt emulsion, the roof is not acceptable for direct application of the Silicone Roof Coating System. A layer of polyester fabric must be adhered (floated) to the existing roof surface prior to the application of

the primer or the silicone coatings. Apply a coat of emulsion at the rate of 3 gal/100 sf. Immediately lay the polyester fabric into the wet emulsion. Only apply enough pressure to the polyester to make positive contact with the emulsion. Do not try to fully embed the fabric into the emulsion. Allow the emulsion to dry. Apply the primer or coating at the recommended rates listed in section 1.10 Table 1.

- I. The existing deck must be returned to a structurally sound, watertight condition prior to installation of the Silicone Roof Coating System.

3.03 SURFACE PREPARATION

- A. Mechanically remove all loose coatings and/or patching material as is possible. Repairs must be made to the substrate where loose patching material is removed using like materials to include removal of existing tape..
- B. Cracks, Control Joints and Expansion Joints
 - 1. Cracks greater than 1/8" shall be ground out to a depth of 1/2", and Mule-Hide JTS-1 Joint & Termination Sealant installed prior to coating application.
 - 2. Control joints shall be inspected and if damaged or deteriorated the joints shall be raked and new joints installed using backer rod and Mule-Hide JTS-1 Joint & Termination Sealant.
 - 3. Expansion joints shall be inspected and if damaged or deteriorated shall be repaired or replaced using appropriate sized backer rod and Mule-Hide JTS-1 Joint & Termination Sealant.
- C. Spalled or loose concrete must be removed and properly repaired returning the substrate to a sound condition.
- D. The deck surface shall be cleaned with Mule-Hide 115 Cleaner in accordance with Mule-Hide's most current Product Data Sheet. Do not dilute the 115 Cleaner. Apply direct to the concrete with a mop, pump sprayer or other suitable low-pressure sprayer at a rate of 1 gallon per 100 square feet. Avoid contact with painted surfaces or vinyl siding. Allow wet contact with the concrete surface for a minimum of 15 minutes. Areas that are heavily contaminated or working in hotter temperatures may require an increased application rate from 1 to 2 gallons per 100 square feet. Rewet the concrete with additional cleaner if needed. Agitate the surface with stiff bristle broom or orbital scrubber. Heavily contaminated areas may require multiple cleanings with scrubbing to obtain a clean surface.
- E. Rinse the deck surface with clean water and a minimum 2,000 psi power washer until no 115 Cleaner residue remains. Allow roof to dry completely prior to system installation. Spot check the dried concrete with a clean rag by wiping the surface of the concrete to determine if any residue remains. If the cloth shows signs of residue (dirt or chalk), then repeat the rinsing of the concrete deck. A second cleaning application may be required.
- F. Check local building ordinances for acceptable disposal of the rinse water. Many areas do not permit discharge into sewer systems or water containment areas. Compliance with local building codes and ordinances is the sole responsibility of the contractor.

- G. Allow 48 hours of dry conditions before coating.
- H. If priming deck surfaces, apply 1 coat of primer at the recommended application rate (see section 1.10 Table 1). Allow a minimum of 8 hours drying time prior to application of the 100% Silicone Roof Coating. Lower temperatures or higher humidity may require longer drying times.

3.04 APPLICATION

- A. All prep work must be done prior to coating the deck surface with the 100% Silicone Roof Coating.
- B. Cracks, Control Joints and Expansion Joints
 1. All cracks or joints must be treated with JTS-1 Joint & Termination Sealant. The overlap on both sides of the joint must be a minimum of 3-1/2 inches.
 2. Cracks 1/8" wide or less must first be filled with the JTS-1 Joint & Termination Sealant and allowed to dry until the next day (minimum of 12 hours) prior to applying the 100% Silicone Roof Coating.
 3. Cracks greater than 1/8" wide shall be ground out a minimum of 1/2" deep. The crack is then filled with JTS-1 Joint & Termination Sealant and allowed to dry until the next day (minimum of 12 hours) prior to stripping the crack with 100% Silicone Roof Coating and reinforcing fabric.
 4. Control joints shall have existing sealant removed. If needed, new backer rod shall be installed and JTS-1 Joint & Termination Sealant shall be used to fill the joint. Allow the sealant to dry until the next day (minimum of 12 hours) prior to stripping the control joint with 100% Silicone Roof Coating and reinforcing fabric.
 5. When stripping-in cracks and control joints, use a minimum 6" wide strip of the Tietex fabric embedded in 100% Silicone Coating centered over the crack/joint.
 6. Apply the 100% Silicone Roof Coating at 1 gallon per 100 square feet and immediately embed the Tietex fabric. Dry brush the fabric smooth. Apply an additional coat of 100% Silicone Roof Coating over the fabric at an application rate of 1 gallon per 100 square feet to fully encapsulate it. Allow to dry until the next day (minimum of 12 hours) prior to applying the 100% Silicone Roof Coating to the concrete deck.
- C. Flashings, Curbs and Penetrations
 1. Corners of curbs and parapets are coated with 100% Silicone Sealant at a rate of 1/8th of an inch thick (125 wet mils). Apply with a brush or trowel 4" wide (2" out from the corner on each side) and 1/8" to 1/4" thick tapering all edges. Allow to dry until the next day (minimum of 12 hours) prior to applying the 100% Silicone Roof Coating.
 2. Curbs flashed with Mod Bit Cap Sheet shall have all seams/edges of flashings sealed with the 100% Silicone Sealant. After primer has dried, Sealant is applied 4" wide the entire length of each seam with a 4" brush, applied approximately 1/8" thick and tapered on the edges.
 3. Scuppers are flashed using 100% Silicone Roof Sealant installed a minimum of 2" into the throat of the scupper, 3" minimum onto the wall or deck surrounding the scupper opening and approximately 1/8" thick.

4. Pipes are flashed using 100% Silicone Roof Sealant. If priming, allow primer to dry a minimum of 6 hours prior to application of the 100% Silicone Roof Sealant.
 - a. If the pipe flashings are in sound condition, 100% Silicone Sealant may be applied with a brush or trowel approximately 1/8" thick around the pipe base extending from the base of the pipe out approximately 3". The sealant shall also be applied vertically a minimum 8" (where possible) encapsulating the existing flashing to the point of termination.
5. Sealant pockets are flashed similar to pipes. The entire top of the pocket and penetrations (minimum 1" onto the penetration) are coated with 100% Silicone Roof Coating.
6. Sealant pockets in sound condition may be coated with the 100% Silicone Sealant applied with a brush or trowel 1/8" to 1/4" thick fully encapsulating the sealant pocket. Sealant should extend out from the base of the pocket a minimum of 3" on all sides with edges tapered to provide a smooth transition for the 100% Silicone Roof Coating.
7. Drains shall have a bead of 100% Silicone Sealant applied and feathered at the rear of the drain ring. Installation of the 100% Silicone Roof Coating shall be installed onto the feathered sealant.
8. JTS-1 Joint & Termination Sealant or Seal-Fast Liqui-Flash are acceptable substitutes for 100% Silicone Roof Sealant

D. Waterways, Valleys, and Areas Which Retain Water

1. Areas identified, after being primed as necessary, should be treated with an additional 1.0 gallon per 100 sf of 100% Silicone Roof Coating beyond the recommended application rate required for the specified warranty duration.

E. Silicone Roof Coating Application

1. Make sure all roof surfaces to receive the roof coating, are clean, free of any contamination or debris and are dry. Make sure all prep work is completed and dry prior to starting coating of the roof surface.
2. Thoroughly stir all containers of 100% Silicone Roof Coating prior to application. Do not thin this product. This product dries through absorption of moisture from the air. Avoid entraining air when mixing. Do not mix at high speeds. Dry time will be faster in humid conditions and on substrates that hold moisture such as concrete. Do not apply this product over damp or wet surfaces.
3. Open and partially full containers will skin over quickly. If this occurs, remove skin and continue using the remaining product. Mule-Hide recommends applying the 100% Silicone Roof Coating either by spraying or rolling.
4. Apply 100% Silicone Roof Coating at the application rate as determined by the warranty requirements. See Section 1.10 Warranties for application rates. Material is fast drying. Do not distribute excessive amounts onto the roof surface prior to rolling. Do not over roll as a textured finish will result. Allow coating to dry. Typical drying time between coats at ambient temperature is typically 2 to 4 hours.
5. Apply a second coat (when required by the warranty requirements) of 100% Silicone Roof Coating at the same application rate as the first coat. The second coat should be applied perpendicular (90 degrees) to the direction the first coat was applied. Material is fast drying. Do not distribute excessive amounts onto the roof

surface prior to rolling. Do not over roll as a textured finish will result. Allow coating to dry. Typical drying time in 60 - 70°F temperatures is 2 to 4 hours depending on the thickness of the application.

6. If spraying, use a multi-pass technique for each coat to obtain even results. Protect unintended surfaces from overspray. It is not recommended to use a spray application if any wind is occurring.
7. Use a wet film thickness gauge during installation to confirm application rates.
8. See Section 1.10 Warranties for additional information on wet/dry film thickness requirements for the various warranties available from Mule-Hide.

F. Walkway Areas

1. Walkways may be constructed over newly installed silicone roof coatings with the use of the Mule-Hide Walkway granules and additional silicone coating.
2. Create outlines for the walkways by taping these areas off with masking or painters tape.
3. Apply a fresh coat of 100% Silicone Roof Coating at a rate of 2 gal/sq.
4. As soon as the silicone is applied immediately broadcast the granules into the wet coating at a minimum rate of 15 lbs. per 100 square feet. Make sure the granules completely cover the new coating.
5. As soon as the granules are broadcast, remove the tape. Do not wait for the silicone to dry.
6. Do not let the silicone skin over before applying the granules as the granules will not adhere to the silicone. The silicone must be wet.
7. Allow the coating to dry until the next day. Once dry, vacuum the loose granules to prevent the excess from going into drains or gutters.
8. Over time, walkway surfaces may wear, but can easily be repaired or resurfaced by applying additional 100% Silicone Roof Coating and new granules.
9. Note: Walkways are maintenance items not covered by Mule-Hide warranties. Additional coating and granules and their application are the responsibility of the building owner.

3.05 PROTECTION

- A. Always follow OSHA guidelines for proper safety clothing and equipment when spraying products.

3.06 CLEAN-UP

- A. Remove all containers, equipment, and debris from the rooftop and project site upon project completion. Refer to each individual Product Data Sheet for clean-up of each individual product.

3.07 MEASUREMENT AND PAYMENT

- A. All work items installed, provided, constructed, etc. with the exception of the unit price items listed in Section 00300L – Bid Form (Lump Sum), shall not be paid for separately but shall be considered subsidiary to the lump sum bid price for the Project. The cost of

all work materials, labor, overhead, insurance, equipment, etc. necessary to finish the work complete in place shall be included in the lump sum bid price for the project.

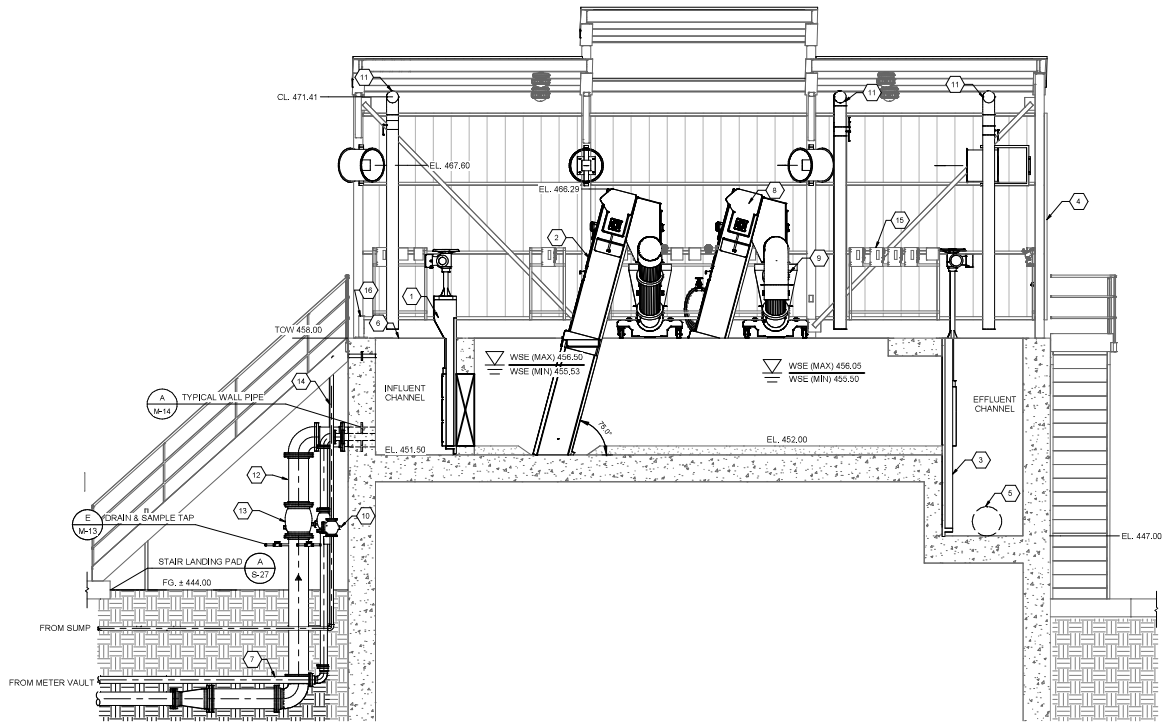
- B. Note: When estimating materials necessary to complete a Silicone Roof Coating System it is the Contractor's responsibility to include material calculations for waste.

END OF SECTION



Revised: 08/01/2018 10:00 AM Headworks Facility Mechanical Section I
10/1/2018 10:00 AM
10/1/2018 10:00 AM

ADDENDUM NO. 4



1 HEADWORKS FACILITY MECHANICAL SECTION I
3/8" = 1'-0"

SCALE IN FEET

NOTES BY SYMBOL	
1	INFLUENT SLIDE GATES (TYP OF 2)
2	MECHANICAL BAR SCREEN (TYP OF 2)
3	DOWNWARD OPENING WEIR GATES (TYP OF 2)
4	SCREENING WALL
5	SCREENED FLOW TO FEB (1" DI)
6	CHECKERED PLATE COVER (TYP)
7	TRUCKED SLUDGE FLOW
8	WASHER/COMPACTOR (TYP OF 2)
9	INSULATED AND HEAT TRACED COMPACTED SCREENINGS DISCHARGE PIPING
10	CHECK VALVE
11	ODOR CONTROL PIPING
12	WCHWTP SLUDGE FLOW
13	PLUG VALVE (TYP)
14	2" SUMP DISCHARGE
15	LOCAL ELECTRICAL DISCONNECT (TYP)
16	DAWT CRANE BASE

GENERAL NOTES

1. RECIRCULATING FANS WILL BE INSTALLED UNDER THE CHANDY FOR AIR CIRCULATION.
2. PLAN SET BASED ON ONE MANUFACTURER FOR SCREENING, WASHER AND COMPACTOR. CONTRACTOR SHALL MODIFY THE LAYOUT AND OBTAIN APPROVAL BY THE ENGINEER AS NEEDED FOR CHOSEN MANUFACTURER.
3. SCREEN MANUFACTURER RECOMMENDED ATTACHMENT TO CONCRETE WALLS MAY VARY. CONTRACTOR SHALL FOLLOW THE MANUFACTURER'S RECOMMENDATIONS FOR MOUNTING AND SEALING OF THE SCREEN.
4. CONTRACTOR SHALL COORDINATE WITH WASHER/COMPACTOR MANUFACTURER FOR PROPER SUPPORT OF SCREENING DISCHARGE PIPE.
5. ADD DRAIN AND SAMPLE PORT ON EACH OF THE INFLUENT LINES NAMELY BAR AND WCHWTP INFLUENT LINES. SIDE STREAM LINE AND SLUDGE DISCHARGE LINE.
6. PLATE MOUNT THE WASHER/COMPACTOR IN LIEU OF CASTERS.



TEAMS REGISTERED ENGINEERING FIRM



VERIFIED
DRAWING
AND SCALE COMPLIANT

CITY OF AUSTIN - AUSTIN WATER
HORNBY BEND BIOSOLIDS MANAGEMENT PLANT HEADWORKS

HEADWORKS FACILITY
MECHANICAL SECTION I

DESIGN: T. KNUDSEN
DRAWN: T. BENSON
REVIEW: P. BENJAMIN, P.E.
DATE: 08/01/2018
CLIENT: CIP 3164.D15

SHEET
M-5

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150124/02 - 08/01/2018 10:00 AM

ADDENDUM NO. 4

