

ADDENDUM #1

This Addendum supplements and amends the original Drawings and Specifications, and shall from the date hereon, become an integral part of the Contract Documents.

PROJECT FOR MONTGOMERY COUNTY WESTERN REGIONAL WATER RECLAMATION FACILITY OPERATIONS AND MAINTENANCE BUILDINGS RENOVATION

PREPARED BY:

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September 1, 2026

GENERAL

This Addendum, including all items listed hereinafter, shall become a part of the Documents, shall be taken into account in preparing the Bid, and shall become a part of the Contract. The work under each branch shall be in accordance with the original Specifications unless accepted in this Addendum.

SPECIFICATIONS

08 44 13 – GLAZED ALUMINUM CURTAIN WALLS – SECTION 08 44 13 has been revised and is attached to this addendum. See the revisions highlighted in yellow.

07 54 19 – PVC MEMBRANE ROOFING – Attached is a specification for a PVC membrane roof which is the specification basis of Alternate #1.

END OF ADDENDUM #1

SECTION 08 44 13 - GLAZED ALUMINUM CURTAIN WALLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the following:
 - 1. Exterior aluminum curtain walls.
 - 2. Outside glazed front set, integral door frame adaptor
 - 3. Exterior manual-swing entrance doors.
 - 4. SunShades
- B. Related Sections:
 - 1. Section 08 80 00 Glazing

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include plans, elevations, sections, full-size details, and attachments to other work.
 - 1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
- C. Samples: For each exposed finish required.
- D. Delegated Design: Design glazed aluminum curtain walls, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated. Design of anchorage system and hardware is to be included in the Delegated Design responsibility, and to be provided by the Curtainwall manufacturer and/or installer.

1.3 INFORMATIONAL SUBMITTALS

- A. Energy Performance Certificates: NFRC-certified energy performance values from manufacturer.
- B. Product test reports.
- C. Field quality-control reports.
- D. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 PERFORMANCE REQUIREMENTS

- A. General Performance: Comply with performance requirements specified, as determined by testing of manufacturer's standard glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Glazed aluminum curtain walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.
- B. Wind Loads:
 - 1. Exterior Walls: Refer to structural drawing S001, specifically the "Ops building gross components and cladding (unfactored) wind loading (ASCE 7-16)" table.
- C. Structural-Test Performance: Test according to ASTM E 330 as follows:
 - 1. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 - 2. Test Durations: 10 seconds.
- D. Deflection of Framing Members: At design wind pressure, as follows:
 - 1. Maximum allowable deflection in any member: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch whichever is less.
- E. Water Penetration under Static Pressure: No evidence of water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 15 psf.
- F. Energy Performance: Exterior aluminum curtain wall systems shall have certified and labeled energy performance ratings in accordance with NFRC.
 - 1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.46 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
 - 2. Condensation Resistance Factor: a minimum of 66

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3. Air Infiltration: Maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. of fixed wall area as determined according to ASTM E 283 at a minimum static-air-pressure differential of 6.24 psf.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Installers shall be certified by NGA
- C. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.
- D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
- E. Energy Performance Standards: Comply with NFRC for minimum standards of energy performance, materials, components, accessories, and fabrication. Comply with more stringent requirements if indicated.

1.7 WARRANTY

- A. Total Curtain Wall Installation
 1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total curtain wall installation. This includes the glass (including insulated units), glazing, anchorage and setting system, sealing, reinforcement, flashing, etc. as it relates to air, water, and structural adequacy and the specifications and approved shop drawings.
 2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at their expense during the warranty period.
- B. Window Material and Workmanship
 1. Provide written guarantee against defects in material and workmanship for 3 years from the date of final shipment.
- C. Finish
 1. Warranty period shall be for 3 years from the date of final shipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide YKK AP America (products are listed below) or comparable product by one of the following:
1. YKK
 2. EFCO Corporation.
 3. Kawneer
 4. Tubelite
 5. Vistawall Architectural Products

2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
1. Sheet and Plate: ASTM B 209.
 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
 3. Extruded Structural Pipe and Tubes: ASTM B 429.
 4. Structural Profiles: ASTM B 308/B 308M.
- B. Steel Reinforcement: With manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
 3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.3 FRAMING SYSTEMS

- A. Exterior Framing Members: Manufacturer's standard extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Basis of Design: YKK YCW 750 XT
 2. Size: 2-1/4" x 7-1/2"
 3. Construction: Thermally improved.
 4. Glazing System: Retained mechanically with gaskets on four sides.
 5. Outside glazed open back curtain wall system for 1" insulating glass, flush glazed
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with non-staining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

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1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 2. Reinforce members as required to receive fastener threads.
- D. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- E. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- F. Framing Sealants: Manufacturer's standard sealants.

2.4 DOOR FRAME

- A. Extruded aluminum door frame designed to be glazed in curtain wall system.
1. Minimum wall thickness of .093.
 2. Depth: 5/8 inch
- B. Accessories:
1. Door stops: Concealed fasteners with snap-on cover, designed for hinges specified in Section 08 71 00 finish Hardware.

2.5 ENTRY DOORS

- A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.
1. Basis of Design: YKK 50D Wide Stile for 1/4" glazing
 2. Door Construction: 1-3/4-inch overall thickness, with minimum 0.125-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
- B. Glazing Stops and Gaskets: Square, snap-on, extruded-aluminum stops and preformed gaskets.
1. Provide nonremovable glazing stops on outside of door.
- C. Entrance Door Hardware: As specified in Section 08 71 00 Finish Hardware.

2.6 GLAZING

- A. Glazing: Comply with Section 08 80 00 Glazing.
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

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1. Pressure plates to be fiberglass.

- C. Glazing Sealants: As recommended by manufacturer.

2.7 ACCESSORY MATERIALS

- A. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

2.8 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Fabrication shall be screw spline.
- C. Shop assemble and glaze frames to the greatest extent possible and shop seal all horizontal to vertical joints.
- D. Fabricate components that, when assembled, have the following characteristics:
 1. Profiles that are sharp, straight, and free of defects or deformations.
 2. Accurately fitted joints with ends coped or mitered.
 3. Physical and thermal isolation of glazing from framing members.
 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 5. Provisions for field replacement of glazing from exterior.
 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- E. Fabricate components that, when assembled, have the following characteristics:
 1. Internal guttering system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
 2. Pressure-equalized system or double barrier design with primary air and vapor barrier at interior side of glazed aluminum curtain wall and secondary seal weeped and vented to exterior.
- F. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.9 ALUMINUM FINISHES

- A. Bronze Anodic Finish: AA-M12C22A44 Class I, 0.07 mm or thicker.

2.10 SUNSHADES

- A. Basis of design – ThermaShade as manufactured by YKK or equal product as manufactured by one of the following companies:

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1. EFCO Corporation.
2. Kawneer
3. Tubelite
4. Vistawall Architectural Products

B. Fabricate components that, when assembled, have the following characteristics:

1. Depth: 36 inches
2. Outrigger – Wedge Outrigger.
3. Concealed anchors
4. Fascia – Wedge Fascia
5. Blades Angles Blades

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Install in accordance with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure non-movement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
7. Seal joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.

D. Install components plumb and true in alignment with established lines and grades.

E. Install glazing as specified in Section 08 80 00 Glazing

3.2 ERECTION TOLERANCES

A. Erection Tolerances: Install glazed aluminum curtain walls to comply with the following maximum tolerances:

1. Plumb: 1/8 inch in 10 feet 1/4 inch in 40 feet
2. Level: 1/8 inch in 20 feet 1/4 inch in 40 feet
3. Alignment:

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- a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
 - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
 - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch
4. Location: Limit variation from plane to 1/8 inch in 12 feet ; 1/2 inch over total length.

END OF SECTION 08 44 13

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ALTERNATE #1

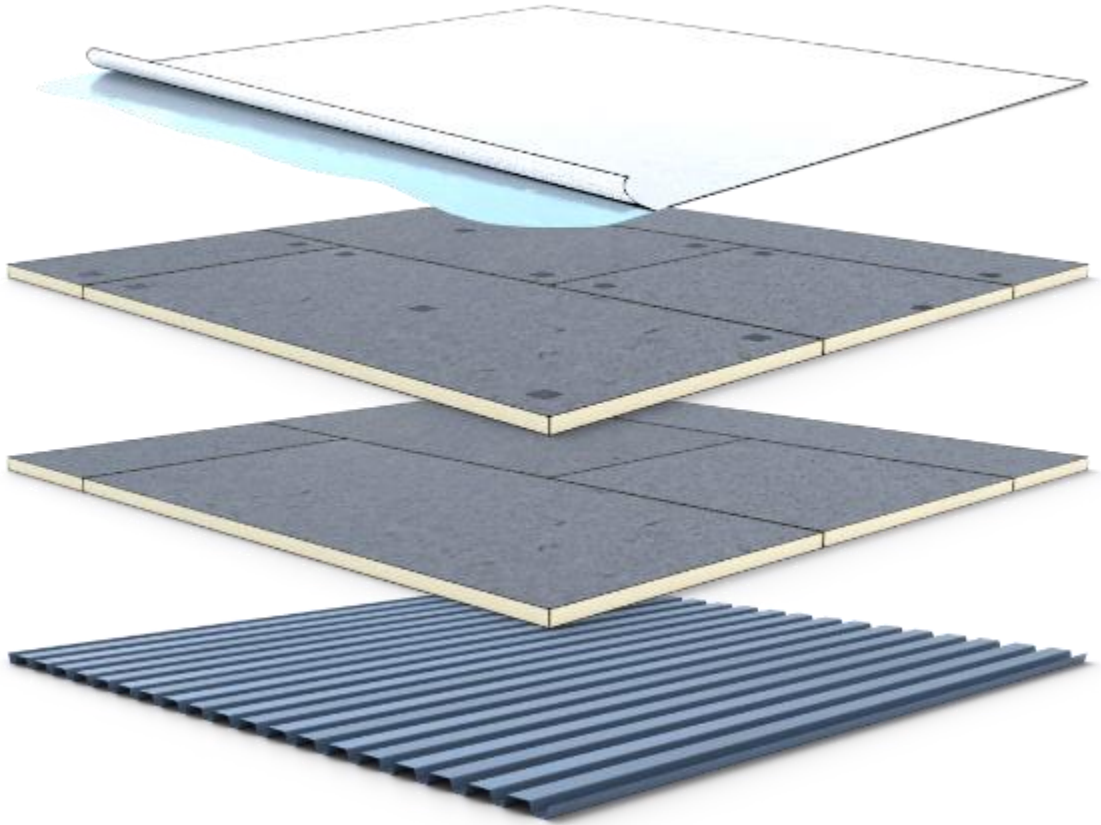
3-part Specification

Montgomery County WRWRF

OPERATIONS AND MAINTENANCE BUILDING

4111 Hydraulic Road
Dayton, OH 45449

Prepared for: Dave Bills | Brown & Bills Architects
Prepared by: Bryan Gottron | Engineered Systems



PART 1 GENERAL – ALTERNATE #1

1.1 SUMMARY

- A. Membrane Type: Duro-Tuff 80-Mil Membrane (Roll Goods)
 - 1. Roll Width: 120" (Installed widths may vary)

2. Membrane Color: White
3. Attachment Type: Adhered
4. Adhesive: Duro-Last® SB IV Adhesive [Roll On]
- B. Insulation Layer 1 Type: Duro-Guard® ISO II (Fiber-Reinforced Facer)
 1. Board Application: Flat Stock
 2. Board Style: Layer Thickness
 3. Board Size: 4' x 8'
 4. Thickness: 2.00"
 5. Attachment Type: Mechanically Fastened
 6. Fasteners: HD Screw (#14)
 7. Plates: 3-Inch Metal Plate
- C. Insulation Layer 2 Type: Duro-Guard® ISO II (Fiber-Reinforced Facer)
 1. Board Application: Flat Stock
 2. Board Style: Layer Thickness
 3. Board Size: 4' x 8'
 4. Thickness: 2.00"
 5. Attachment Type: Loose-Laid
 6. Loose-Laid: Loose-Laid
- D. Deck Type: Steel Deck (22 ga)
- E. Prefabricated flashings, corners, parapets, stacks, vents, and related details.
- F. Fasteners, adhesives, and other accessories required for a complete roofing installation.
- G. Traffic Protection.

1.2 REFERENCES

- A. ASTM INTERNATIONAL (ASTM)
 1. (2019) Standard Test Methods for Coated Fabrics (D751)
 2. (2021) Standard Specification for Poly(Vinyl Chloride) Sheet Roofing (D4434/D4434M)
 3. (2022) Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board (C1289)
 4. (2020) Standard Test Methods for Fire Tests of Roof Coverings (E108)
 5. (2020) Standard Test Methods for Fire Tests of Building Construction and Materials (E119)
- B. UL SOLUTIONS (UL)
 1. (2021) UL Roofing Systems (TGFU.R10128)
- C. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)
 1. (2014) Minimum Design Loads for Buildings and Other Structures (ASCE Standard - ASCE/SEI 7-10)

2. (2017) Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE Standard - ASCE/SEI 7-16)
 3. (2022) Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE Standard - ASCE/SEI 7-22)
- D. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
1. (2019) NRCA Roofing Manual - Membrane Systems

1.3 SYSTEM DESCRIPTION

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, 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 membrane manufacturer based on testing and field experience.
- C. Physical Properties (must meet or exceed):
1. Roof product must meet the requirements of Type III PVC sheet roofing as defined by ASTM D4434.
 2. Thickness: 80 mil, nominal, in accordance with ASTM D751.
 3. Thickness over Scrim: ≥ 41 mil in accordance with ASTM D7635.
 4. Breaking Strength: ≥ 481 lbf. (machine direction) and ≥ 341 lbf. (cross machine direction) in accordance with ASTM D751 Grab Method.
 5. Elongation at Break: $\geq 33\%$ (machine direction) and $\geq 33\%$ (cross machine direction) in accordance with ASTM D751 Grab Method.
 6. Seam Strength: ≥ 452 lbf. in accordance with ASTM D751 Grab Method.
 7. Tear Strength: ≥ 53 lbf. (machine direction) and ≥ 196 lbf. (cross machine direction) in accordance with ASTM D751 Procedure B.
 8. Low Temperature Bend: Pass at -40°F in accordance with ASTM D2136.
 9. Heat Aging: Pass after being conditioned for 56 days in oven maintained at 176°F in accordance with ASTM D3045.
 10. Accelerated Aging: Pass after 10,000 hours of total test time in accordance with ASTM G155.
 11. Dimensional Stability: Change of -0.10% (machine direction) and -0.10% (cross machine direction) in accordance with ASTM 1204.
 12. Water Absorption: $< .10\%$ at 158°F for 168 hours in accordance with ASTM D570.
 13. Static Puncture Resistance: ≥ 33 lbf. in accordance with ASTM D5602.
 14. Dynamic Puncture Resistance: ≥ 14.7 ft-lbf. in accordance with ASTM D5635.
- D. Cool Roof Rating Council (CRRC) (Membrane must be listed on the CRRC website):
1. Solar Reflectance (Initial): $\geq 85\%$
 2. Solar Reflectance (3-Year Aged): $\geq 73\%$

3. Thermal Emittance (Initial): $\geq 89\%$
4. Thermal Emittance (3-Year Aged): $\geq 88\%$
5. Solar Reflectance Index (SRI) (Initial): $\geq 108\%$
6. Solar Reflectance Index (SRI) (3-Year Aged): $\geq 90\%$

E. Insulation:

1. General Requirements
 - a. Install using a minimum of two layers.
 - b. Configuration as indicated on the drawings.
2. Duro-Guard® ISO II (Fiber-Reinforced Facer)
 - a. Layer Thickness: 2.00"
3. Duro-Guard® ISO II (Fiber-Reinforced Facer)
 - a. Layer Thickness: 2.00"

1.4 SUBMITTALS

- A. Product data sheets to be used, with the following information included:
 1. Preparation instructions and recommendations
 2. Storage and handling requirements and recommendations
 3. Installation methods
 4. Maintenance requirements
- B. Sustainability Documentation:
 1. NSF/ANSI Standard 347 Certificate
 2. Type III product-specific Environmental Product Declaration
- C. Shop Drawings: Indicate insulation pattern, overall membrane layout, field seam locations, joint or termination detail conditions, and location of fasteners.
- D. Provide verification samples for each product specified (two samples representing each product, color and finish):
 1. 4-inch by 6-inch sample of roofing membrane, of color specified.
 2. 4-inch by 6-inch sample of walkway pad.
 3. Termination bar, fascia bar with cover, drip edge, and gravel stop if to be used.
 4. Each fastener type to be used for installing membrane, insulation/recover board, termination bar and edge details.
- E. Installer Certification: Certification from the roofing system manufacturer that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- F. Manufacturer's warranties.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with manufacturer's installation instructions.

- B. Manufacturer Qualifications: A manufacturer specializing in the production of standard reinforced PVC membranes systems and utilizing a Quality Control Manual during the production of the membrane roofing system that has been approved by and is inspected by Underwriters Laboratories.
- C. Installer Qualifications: Company specializing in installation of roofing systems similar to those specified in this project and approved by the roofing system manufacturer.
- D. Source Limitations: Obtain components for membrane roofing system from roofing membrane manufacturer.
- E. There shall be no deviations from the roof membrane manufacturer's specifications or the approved shop drawings without the prior written approval of the manufacturer.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable code for roof assembly fire hazard, wind uplift, and cool roof requirements.
- B. Fire Hazard Requirements: Provide membrane roofing materials with the following fire-test-response characteristics. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Class A
 - 2. Fire-test-response standard: Comply with ASTM E108 for application and roof slopes indicated.
 - 3. Fire-Resistance Ratings: Comply with ASTM E119 for fire-resistance-rated roof assemblies of which roofing system is a part.
 - 4. Conform to applicable code for roof assembly fire hazard requirements.
- C. Wind Uplift Requirements: Roofing System Design: Provide a roofing system designed to resist uplift pressures calculated according to the current edition of ASCE/SEI 7, Minimum Design Loads and Associated Criteria for Buildings and Other Structures.

1.7 PRE-INSTALLATION MEETING

- A. Convene meeting not less than one week before starting work of this section.
- B. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following:
 - 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 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 will affect 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.
9. Review existing roof manufacturer's recycling program and return roofing system to the manufacturer for recycling.

1.8 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.
- 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.
- 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. Store roof materials and place equipment in a manner to avoid permanent deflection of deck.
- E. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.9 WARRANTY

- A. Contractor's Warranty: The contractor shall warrant the roof application with respect to workmanship and proper application for two (2) years from the effective date of the warranty issued by the manufacturer.
- B. Manufacturer's Warranty: Must be no-dollar limit type and provide for completion of repairs, replacement of membrane or total replacement of the roofing system at the then-current material and labor prices throughout the life of the warranty. In addition the warranty must meet the following criteria:
 1. Warranty Period: 30 years from date issued by the manufacturer.
 2. Must provide adequate or sufficient drainage to prevent damage and/or leaks resulting from ponding water.
 3. Issued direct from and serviced by the roof membrane manufacturer.
 4. Transferable for the full term of the warranty.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Manufacturer: Duro-Last®, which is located at: 525 Morley Drive, Saginaw, MI 48601.
Telephone: 800-248-0280.
- B. All roofing system components to be provided or approved by Duro-Last
- C. Substitutions: Not permitted.

2.2 ROOFING SYSTEM COMPONENTS

A. Roofing Membrane:

1. Properties:

- a. Type: Duro-Tuff 80-Mil Membrane (Roll Goods)
- b. Roll Width: 120" (Installed widths may vary)
- c. Membrane Color: White
- d. Attachment Type: Adhered
- e. Adhesive: Duro-Last® SB IV Adhesive [Roll On]

2. Features:

- a. ASTM D4434, Type III
- b. Fabric-reinforced, PVC, NSF/ANSI 347 Gold or Platinum Certification, and a product-specific third-party verified Environmental Product Declaration.
- c. Minimum recycle content 7% post-industrial and 0% post-consumer.
- d. Recycled at end of life into resilient flooring or concrete expansion joints.

B. Insulation:

1. General Requirements

- a. Provide preformed roof insulation boards that comply with requirements and referenced standards, as selected from manufacturer's standard sizes.
- b. Provide preformed saddles, crickets, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- c. Provide roof insulation accessories approved by the roof membrane manufacturer and as recommended by insulation manufacturer for the intended use.

2. Component:

a. Properties:

- 1. Type: Duro-Guard® ISO II (Fiber-Reinforced Facer)
- 2. Board Application: Flat Stock
- 3. Size: 4' x 8'
- 4. Method: Layer Thickness: 2.00"
- 5. Attachment Type: Mechanically Fastened
- 6. Fasteners: HD Screw (#14)
- 7. Plates: 3-Inch Metal Plate

b. Features:

1. Closed-cell polyisocyanurate foam core insulation board.
2. Complying with ASTM C1289, Type II, felt or glass-fiber mat facer on both major surfaces.
3. Provide Duro-Last factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening insulation and/or insulation cover boards in conformance to specified design requirements.

3. Component:

a. Properties:

1. Type: Duro-Guard® ISO II (Fiber-Reinforced Facer)
2. Board Application: Flat Stock
3. Size: 4' x 8'
4. Method: Layer Thickness: 2.00"
5. Attachment Type: Loose-Laid

b. Features:

1. Closed-cell polyisocyanurate foam core insulation board.
2. Complying with ASTM C1289, Type II, felt or glass-fiber mat facer on both major surfaces.
3. Provide Duro-Last factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening insulation and/or insulation cover boards in conformance to specified design requirements.

C. Deck Type:

1. Properties:

- a. Type: Steel Deck (22 ga)

D. Accessory Materials: Provide accessory materials supplied by or approved for use by Duro-Last®:

1. Sheet Flashing: Manufacturer's standard reinforced PVC sheet flashing.
2. Penetrations and Flashings: Manufactured using standard reinforced PVC membrane.
 - a. Duro-Last® Parapet Flashing
 - b. Duro-Last® Inside and Outside Corners
 - c. Duro-Last® Stack Flashing
 - d. Duro-Last® Curb Flashing
3. Drains, Scuppers, and Vents: Manufactured using standard reinforced PVC membrane.
 - a. Duro-Last® Drain Boot
 - b. Duro-Last® Drain Guard

- c. Composite Drain Rings (CDRs)
- 4. Fasteners: Factory-coated steel fasteners meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane and insulation to substrate. Supplied by Duro-Last.
 - a. HD Screw (#14)
- 5. Plates: Metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane and insulation to substrate. Supplied by Duro-Last.
 - a. 3-Inch Metal Plate
- 6. Non-Fleece Membrane Adhesives: Compatible with roofing system and supplied by Duro-Last.
 - a. Duro-Last® SB IV Adhesive [Roll On]
- 7. Termination and Edge: Compatible with roofing system and supplied by Duro-Last.
 - a. Duro-Last® Termination Bar
 - b. Snap Coping
- 8. Additional Roof Components: Compatible with roofing system and supplied by Duro-Last.
 - a. Roof Trak® III Walkway Pad (PVC)

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that the surfaces and site conditions are ready to receive work.
- B. Verify that the deck is supported and secured.
- C. Verify that the deck is clean and smooth, free of depressions, waves, or projections, and properly sloped to drains, valleys, eaves, scuppers or gutters.
- D. Verify that the deck surfaces are dry and free of standing water, ice or snow.
- E. Verify that all roof openings or penetrations through the roof are solidly set.
- F. If substrate preparation is the responsibility of another contractor, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Surfaces shall be clean, smooth, free of fins, sharp edges, loose and foreign material, oil, grease, and bitumen.
- D. Tearing off Existing Single-Ply System:
 - 1. Remove existing single-ply membrane and return to the manufacturer for recycling.

3.3 INSTALLATION

A. Insulation:

1. General Requirements

- a. Install insulation in accordance with the roof manufacturer's requirements.
- b. Insulation shall be adequately supported to sustain normal foot traffic without damage.
- c. Where field trimmed, insulation shall be fitted tightly around roof protrusions with no gaps greater than ¼ inch.
- d. Tapered insulation boards shall be installed in accordance with the insulation manufacturer's shop drawings.
- e. No more insulation shall be applied than can be covered with the roof membrane by the end of the day or the onset of inclement weather.
- f. If more than one layer of insulation is used, all joints between subsequent layers shall be offset by at least 6 inches.

2. Duro-Guard® ISO II (Fiber-Reinforced Facer)

- a. Use only fasteners, stress plates and fastening patterns accepted for use by the roof manufacturer. Fastening patterns must meet applicable design requirements.
- b. Install fasteners in accordance with the roof manufacturer's requirements. Fasteners that are improperly installed must be replaced or corrected.
- c. Install all layers in parallel courses with end joints staggered 50% and adjacent boards butted together with no gaps greater than ¼ inch.

3. Duro-Guard® ISO II (Fiber-Reinforced Facer)

- a. Loosely lay insulation boards in parallel courses with end joints staggered 50% and adjacent boards butted together with no gaps greater than ¼ inch.

B. Roofing Membrane:

1. General Requirements

- a. Install membrane in accordance with the roof manufacturer's requirements.
- b. Cut membrane to fit neatly around all penetrations and roof projections.

2. Duro-Tuff 80-Mil Membrane (Roll Goods)

- a. Read the adhesive's Safety Data Sheet (SDS) prior to using the adhesive.
- b. Follow application guidelines outlined in the adhesive's Product Data Sheet.
- c. Inspect the surface of the deck/substrate. The deck/substrate must be clean, smooth, dry, and free of sharp edges, dust, contaminants, oil, grease, and loose, foreign material that may affect the installation of the roofing system and its performance.
- d. Unroll roofing membrane and position with a minimum 6-inch overlap.
- e. Fold the roof section back onto itself to expose half of the roof area to be covered by that section.

- f. Apply adhesive in front of the fold along its length. Apply at the required rate in smooth, even coatings without voids, globs, puddles or similar irregularities. Use care not to contaminate the area of the membrane where hot air welding will occur.
 - g. Lift the top layer of membrane and, starting at the fold, use a stiff squeegee or broom to push the membrane into the adhesive.
 - h. Repeat previous steps for the second half of the roof section.
- C. Weld overlapping sheets together using hot air. Minimum weld width is 1-1/2 inches.
- D. Check field welded seams for continuity and integrity and repair all imperfections by the end of each work day.
- E. Flashings: Complete all flashings and terminations as indicated on the drawings and in accordance with the membrane manufacturer's requirements.
 - 1. Provide securement at all membrane terminations at the perimeter of each roof level, roof section, curb flashing, skylight, expansion joint, interior wall, penthouse, and other similar condition.
 - a. Do not apply flashing over existing thru-wall flashings or weep holes.
 - b. Secure flashing on a vertical surface before the seam between the flashing and the main roof sheet is completed.
 - c. Extend flashing membrane a minimum of 6 inches (152 mm) onto the main roof sheet beyond the mechanical securement.
 - d. Use care to ensure that the flashing does not bridge locations where there is a change in direction (e.g. where the parapet meets the roof deck).
 - 2. Penetrations:
 - a. Flash all pipes, supports, soil stacks, cold vents, and other penetrations passing through the roofing membrane as indicated on the Drawings and in accordance with the membrane manufacturer's requirements.
 - b. Utilize custom prefabricated flashings supplied by the membrane manufacturer.
 - c. Existing Flashings: Remove when necessary to allow new flashing to terminate directly to the penetration.
 - 3. Pipe Clusters and Unusual Shapes:
 - a. Clusters of pipes or other penetrations which cannot be sealed with prefabricated membrane flashings shall be sealed by surrounding them with a prefabricated vinyl-coated metal pitch pan and sealant supplied by the membrane manufacturer.
 - b. Vinyl-coated metal pitch pans shall be installed, flashed and filled with sealant in accordance with the membrane manufacturer's requirements.
 - c. Pitch pans shall not be used where prefabricated or field fabricated flashings are possible.
- F. Roof Drains: Coordinate installation of roof drains and vents.

1. Drain Assemblies with Clamping Rings:

- a. Remove existing roofing system materials from drain bowl and clamping ring.
- b. The membrane must extend beyond the inside of the clamping ring.
- c. Use a manufacturer supplied or approved sealant (1/2 tube minimum) between the membrane and drain bowl assembly.
- d. After the membrane is properly installed onto the bowl and the clamping ring set in place, all bolts securing the ring must be installed to provide constant, even compression on the sealant. If bolts are broken or missing, replacements must be installed.

2. Drain Boots:

- a. Remove existing flashing and asphalt at existing drains in preparation for sealant and membrane.
- b. Use a manufacturer supplied or approved sealant (1/2 tube minimum) to the outside of the drain boot and insert it into the drain.
- c. Fasten membrane around the perimeter of the drain with the same fastening pattern as the field membrane, no less than 1 fastener per drain.
- d. Install a pair of composite drain rings (CDRs) to compress the boot to the pipe. Ensure the CDR openings face in opposite directions.
- e. Secure the manufacturer's drain guard over the opening by heat welding the attachment tabs to the roof membrane.

G. Edge Details:

1. Provide edge details as indicated on the Drawings. Install in accordance with the membrane manufacturer's requirements.
2. Join individual sections in accordance with the membrane manufacturer's requirements.
3. Coordinate installation of metal flashing and counter flashing.
4. Manufactured Roof Specialties: Coordinate installation of copings, counter flashing systems, gutters, downspouts, and roof expansion assemblies.

H. Walkways:

1. Install walkways in accordance with the membrane manufacturer's requirements.
2. Provide walkways where indicated on the Drawings.
3. Install walkway pads at roof hatches, access doors, rooftop ladders and all other traffic concentration points regardless of traffic frequency. Provided in areas receiving regular traffic to service rooftop units or where a passageway over the surface is required.
4. Do not install walkways over flashings or field seams until manufacturer's warranty inspection has been completed.

I. Water Cut-Offs:

1. Provide water cut-offs on a daily basis at the completion of work and at the onset of inclement weather.
2. Provide water cut-offs to ensure that water does not flow beneath the completed sections of the new roofing system.
3. Remove water cut-offs prior to the resumption of work.
4. The integrity of the water cut-off is the sole responsibility of the roofing contractor.
5. Any membrane contaminated by the cut-off material shall be cleaned or removed.

3.4 FIELD QUALITY CONTROL

- A. The membrane manufacturer's representative shall provide a comprehensive final inspection after completion of the roof system. All application errors shall be addressed and final punch list completed.

3.5 PROTECTION

- A. Protect installed roofing products from construction operations until completion of project.
- B. Where traffic is anticipated over completed roofing membrane, protect from damage using durable materials that are compatible with membrane.
- C. Repair or replace damaged products after work is completed.

END OF SECTION
