

BIDDING DOCUMENTS FOR

BIRCHVIEW ELEMENTARY SCHOOL ROOF REPLACEMENT & A/C UPGRADE ISHPEMING, MICHIGAN

Prepared by:

U.P. Engineers & Architects, Inc.
424 S Pine Street
Ishpeming, MI 49849



November 9, 2022

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SECTION 00 11 16 – ADVERTISEMENT FOR BID

Project: Birchview Elementary School – Roof Replacement & A/C Upgrade

Owner: Ishpeming School District No. 1
319 East Division Street
Ishpeming, Michigan 49849

Architect/Engineer:
U.P. Engineers & Architects, Inc. (UPEA)
424 South Pine Street
Ishpeming, Michigan 49849
(906) 485-1011
www.upea.com

Date: November 9, 2022

Bids will be accepted under seal to the Office of the Superintendent for renovations to Birchview Elementary School, which is located at 319 E. Division St., Ishpeming, Michigan.

Owner will receive Bids at the Office of the Superintendent at the address above, until 3:00 PM local time on the 5th of December, 2022, at which time and place the Bids will be publicly opened. Bids not received by the indicated time will not be opened.

A walkthrough will be held for interested contractors on November 22, 2021 at 3:00 p.m. Eastern Standard Time. Meet at the project location; Birchview Elementary School, 663 Poplar Street, Ishpeming. All interested contractors are encouraged to attend. Meet in the parking lot.

Project Description: Replace building roof and provide a new rooftop unit (for cooling only) at the Office area.

Bidding Documents for a Stipulated Price contract may be obtained by contacting UPEA, whose contact information is listed above, in either paper form or as pdf documents on a flash drive, as follows:

Paper copy: for a \$100 non-refundable fee

Electronic copy: for a \$50 non-refundable fee

Documents will also be available for viewing at the office of the Architect and at the following Builders Exchanges: Iron Mountain-Kingsford, Marquette, Michigan, Northwest Michigan, and McGraw Hill Construction-Dodge (Lansing).

Bidders will be required to provide Bid security according to the requirements in Section 00 21 13 - Instructions to Bidders. Bidders are required to submit qualifications to the approval of the Architect and Owner with their bid. Submit your Bid on the Bid Form provided. Refer to other Bidding requirements described in Section 00 21 13.

Bids are required to be submitted under a condition of irrevocability for a period of 45 days after submission.

Owner reserves the right to waive irregularities and to accept or reject any or all Bids.

END OF DOCUMENT

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

1.1 SUMMARY

- A. Document Includes:
 - 1. Bid submission.
 - 2. Intent.
 - 3. Work identified in Contract Documents.
 - 4. Contract Time.
 - 5. Definitions.
 - 6. Contract Documents identification.
 - 7. Availability of documents.
 - 8. Examination of documents.
 - 9. Inquiries and Addenda.
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 - 12. Prebid meeting.
 - 13. Bidder qualifications.
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 - 17. Bid Security.
 - 18. Bid Form requirements.
 - 19. Bid Form signature.
 - 20. Bid opening.
 - 21. Duration of offer.
 - 22. Acceptance of offer.

- B. Related Documents:
 - 1. Document 00 11 16 - Invitation to Bid.
 - 2. Document 00 41 13 - Bid Form - Stipulated Sum (Single-Prime Contract).

1.2 BID SUBMISSION

- A. Bids signed and sealed, executed, and dated will be received by the Owner located at the Office of the Superintendent as noted on the Advertisement for Bids.
- B. Bids submitted after the above time may be returned to Bidder unopened.
- C. Amendments to submitted Bids will be permitted when received in writing prior to Bid closing and when endorsed by the same party or parties who signed and sealed the Bid.
- D. Bidders may withdraw their Bid by written request before the above time.

1.3 INTENT

- A. The intent of this Bid request is to obtain an offer to perform work to complete the Work for a Stipulated Sum contract, according to Contract Documents.

1.4 WORK IDENTIFIED IN CONTRACT DOCUMENTS

- A. Work of this proposed Contract as described in the Advertisement for Bids.

1.5 CONTRACT TIME

- A. Perform the Work within the time stated in the Bid Form. Bidder, in submitting an offer, accepts Contract Time period stated for performing the Work. Owner requires Work of this Contract be completed as soon as possible.

1.6 DEFINITIONS

- A. Bidding Documents: Contract Documents supplemented with Advertisement for Bids, Instructions to Bidders, Bid Form, and Bid securities.
- B. Contract Documents: AIA A105-2017.
- C. Bid: Executed Bid Form and required attachments submitted according to Instructions to Bidders.
- D. Bid Sum: Monetary sum identified by the Bidder in the Bid Form.

1.7 CONTRACT DOCUMENTS IDENTIFICATION

- A. Contract Documents are identified as Project number I31-02194 as prepared by U.P. Engineers & Architects, Inc. and identified in the Project Manual.

1.8 AVAILABILITY OF DOCUMENTS

- A. Bidding Documents may be obtained as stated in Advertisement for Bids.
- B. Bidding Documents are made available only for the purpose of obtaining offers for this Project. Their use does not grant a license for other purposes.

1.9 EXAMINATION OF DOCUMENTS

- A. Upon receipt of Bidding Documents verify that documents are complete. Notify Architect if documents are incomplete.
- B. Immediately notify Architect upon finding discrepancies or omissions in Bidding Documents.

1.10 INQUIRIES AND ADDENDA

- A. Requests for Information/Clarification:
 1. Direct questions in writing to randerson@upea.com or Fax: 906.485.1013.
 2. Submit questions not less than seven days before date set for receipt of Bids.
 3. Verbal answers are not binding on any party.

4. Replies will be made by Addenda.
5. Responses to inquiries affecting clarity of documents or perceived to affect cost will be addressed by Addenda, to be issued during Bidding period.

B. Addenda:

1. Addenda will be sent to known Bidders and to those who are known to have received a complete set of Bidding Documents.
2. Addenda become part of Contract Documents.
3. Include resultant costs in Bid Price.

1.11 PRODUCT SUBSTITUTIONS

- A. Where Bidding Documents stipulate particular products, substitution requests will be considered by Architect up to 10 days before receipt of Bids.
- B. With each substitution request, provide sufficient information for Architect to determine acceptability of proposed products. Comply with substitution request submittal requirements in Section 01 60 00 - Product Requirements including the use of the Substitution Request Form.
- C. When a request to substitute a product is made, Architect may approve the substitution. Approved substitutions will be identified by Addenda.
- D. In submission of substitutions to products specified, Bidders shall include in their Bid changes required in the Work changes to Contract Time and changes to Contract Sum to accommodate such approved substitutions. Later claims by the Bidder for an addition to the Contract Time or Contract Sum because of changes in Work necessitated by use of substitutions will not be considered.

1.12 SITE EXAMINATION

- A. Examine the Project site before submitting a Bid.

1.13 PREBID MEETING

- A. A prebid meeting is scheduled as listed in the Advertisement for Bids.
- B. General Contract Bidders are required to attend.
- C. Representatives of the Architect and Owner will attend.
- D. Information relevant to Bidding Documents will be issued by Addenda.

1.14 BIDDER QUALIFICATIONS

- A. To demonstrate qualification for performing the Work of this Contract, Bidders may be requested to submit written evidence of financial position, previous experience, and current commitments.

1.15 SUBCONTRACTORS

- A. Owner reserves the right to reject a proposed Subcontractor for reasonable cause.

1.16 SUBMISSION PROCEDURE

- A. Bidders shall be solely responsible for delivery of Bids in manner and time prescribed.
- B. Submit two copies of executed offer on Bid Forms provided, signed, and sealed with required security deposit in a closed opaque envelope, clearly identified with Bidder's name and address, Project name, and Owner's name on the outside.
- C. Improperly completed information, including irregularities in Bid bond, may be cause not to open the Bid Form envelope and to declare the Bid invalid or informal.
- D. An abstract summary of submitted Bids will be made available to all Bidders following Bid opening.

1.17 BID INELIGIBILITY

- A. Bids that are unsigned, improperly signed or sealed, conditional, illegible, and obscure, or Bids that contain arithmetical errors, erasures, alterations, or irregularities of any kind, may be declared unacceptable at Owner's discretion.
- B. Bid Forms, Appendices, and enclosures that are improperly prepared may be declared unacceptable at Owner's discretion.
- C. Failure to provide security deposit may invalidate the Bid at Owner's discretion.

1.18 BID SECURITY

- A. Bids shall be accompanied by Bid security as follows:
 - 1. Bid bond of a sum no less than 10 percent of the Bid Sum on AIA A310 - Bid Bond or on standard surety company form.
- B. Endorse Bid bond in name of the Owner as obligee, signed and sealed by the principal (Contractor) and surety.
- C. If the accepted Bidder fails to execute the Agreement and the indicated bonds within 10 days after the Notice of Award, the Notice of Award may be annulled, and the Bid security of the Bidder will be forfeited.
- D. Include the cost of Bid security in the Bid Sum.
- E. If no contract is awarded, Bid security will be returned.

1.19 BID FORM SIGNATURE

- A. Sign Bid Form as follows:

1. Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Include the words "Sole Proprietor" under the signature. Affix seal.
2. Partnership: Signature of all partners in the presence of a witness who will also sign. Include the word "Partner" under each signature. Affix seal to each signature.
3. Corporation: Signature of at least one duly authorized signing officer. Include the officer's capacity under each signature. Affix the corporate seal. If Bid is signed by officials other than the president, secretary, or treasurer of the company, submit a copy of the bylaws or a resolution of the board of directors authorizing them to do so, with the Bid Form in the Bid envelope.
4. Joint Venture: Signature of all parties of the joint venture under their respective seals in a manner appropriate to such party as described above, similar to requirements for Partnerships.

1.20 BID OPENING

- A. Bids will be opened publicly, immediately after the time for receipt of Bids.

1.21 DURATION OF OFFER

- A. Bids shall remain open to acceptance and shall be irrevocable for a period of 30 days after Bid closing date.

1.22 ACCEPTANCE OF OFFER

- A. Owner reserves the right to waive irregularities and to accept or reject any or all offers.
- B. After acceptance by Owner, Architect, on behalf of Owner, will issue to the accepted Bidder a written Notice of Award.
- C. Notwithstanding delay in the preparation and execution of the Agreement, accepted Bidder shall be prepared, upon written Notice to Proceed, to commence work within seven days following receipt of official written order of Owner to proceed, or on date stipulated in such order.
- D. The accepted Bidder shall assist and cooperate with Owner to prepare Agreement and shall execute Agreement and return it to Owner within seven days following its presentation.

END OF DOCUMENT

DOCUMENT 00 41 13

BID FORM - STIPULATED SUM

Project: Birchview Elementary School – Roof Replacement & A/C Upgrade

Owner: Ishpeming School District No. 1
663 Poplar Street
Ishpeming, Michigan 49849

Date: _____

Submitted by: _____
(Firm name and address)

(Telephone Number)

1. OFFER

1.1 Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by U.P. Engineers and Architects, Inc., Architect for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Bid Sum of:

\$_____, (_____dollars), in lawful money of the United States of America.

- We have included the Bid Bond as required by the Instruction to Bidders.
- All applicable federal taxes are included and State of Michigan taxes are included in the Bid.

2. ACCEPTANCE

This offer shall be open to acceptance and irrevocable for forty-five days from the bid closing date.

If this bid is accepted by the Owner within the time period stated above, we will:

- Execute the Agreement within seven days of receipt of Notice of Award.
- Furnish the required bonds at the time of the execution of the Agreement.
- Commence work in conformance with requirements found in Instructions to Bidders.

If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required bonds, the bid bond shall be forfeited as damages to the Owner by reason of our failure.

3. CONTRACT TIME

If this Bid is accepted, we will Complete Work within the time specified in Section 01 10 00. Bidder agrees to pay as liquidated damages the sum of \$300 for each calendar day thereafter as provided in Article 3 of the Contract.

4. CHANGES TO THE WORK

On Work added to the Contract, changes in the Work will be net cost plus a percentage fee of _____ percent overhead and profit on the net cost of our own Work, and _____ percent on the gross cost of Work performed by any Subcontractor.

On Work deleted from the Contract, our credit to the Owner shall be the approved net cost plus _____ percent of the overhead and profit percentage noted above.

5. ADDENDA

The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.

Addendum # _____ Dated _____

Addendum # _____ Dated _____

Addendum # _____ Dated _____

6. SUBCONTRACTORS – N/A

The following firms have submitted costs for their portion of the Work, and it is the intent of this Contractor to enter into a Subcontractor agreement if we are awarded the Work:

7. APPENDICES

The Bid Bond documents are attached to and made a condition of the Bid

8. BID FORM SIGNATURES

(Seal)

The Corporate Seal of: _____
(Bidder - print the full name of your firm)

was hereunto affixed in the presence of:

(Authorized signing officer)

(Title)

If the Bid is a joint venture or partnership, add additional forms of execution for each member of the joint venture in the appropriate form or forms as above.

END OF DOCUMENT

SECTION 00 52 14 - AGREEMENT FORM - AIA STIPULATED SUM (SINGLE-PRIME CONTRACT)

1.1 SUMMARY

- A. Document Includes:
 - 1. Agreement.
 - 2. General Conditions.

1.2 DOCUMENTS

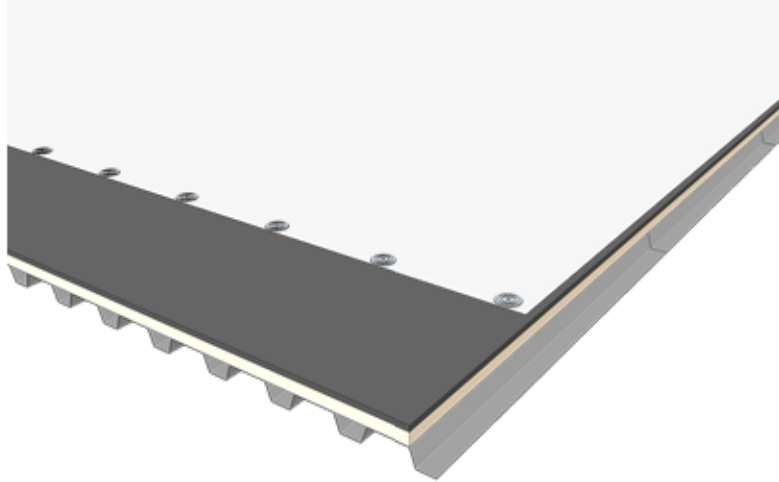
- A. Basis of Agreement between Owner and Contractor: **AIA Document A105 – 2017**, *Standard Form of Agreement between Owner and Contractor*.

END OF DOCUMENT

3-Part Specification
Division 07 54 19 - Polyvinyl-Chloride Roofing

Prepared For: Matt Treado
UP Architects and Engineers

Prepared By:
Duro-Last Roofing



Duro-Last Roof Assembly Description

- **Duro-Last® PVC thermoplastic membrane**
Membrane Thickness: 50 mil
Color: Light Gray
Attachment: Attached with mechanical fasteners
- **Rigid Insulation**
- **Steel Roof Deck**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Remove existing epdm – Existing insulation is to remain.
- B. Duro-Last® PVC thermoplastic membrane attached with mechanical fasteners.
- C. Prefabricated flashings, corners, parapets, stacks, vents, and related details.
- D. Fasteners, adhesives, and other accessories required for a complete roofing installation.
- E. Traffic Protection.

1.2 REFERENCES

- A. NRCA - The NRCA Roofing and Waterproofing Manual.
- B. ASCE 7 - Minimum Design Loads For Buildings And Other Structures.
- C. UL - Roofing Materials and Systems Directory, Roofing Systems (TGFU.R10128).
- D. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- E. ASTM D 751 - Standard Test Methods for Coated Fabrics.
- F. ASTM D 4434 - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing.
- G. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.
- H. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

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:
 - 1. Roof product must meet the requirements of Type III PVC sheet roofing as defined by ASTM D 4434 and must meet or exceed the following physical properties.
 - 2. Thickness: 50 mil, nominal, in accordance with ASTM D 751.
 - 3. Thickness Over Scrim: ≥ 28 mil in accordance with ASTM D 751.
 - 4. Breaking Strengths: ≥ 390 lbf. (MD) and ≥ 438 lbf. (XMD) in accordance with ASTM D 751, Grab Method.
 - 5. Elongation at Break: $\geq 31\%$ (MD) and $\geq 31\%$ (XMD) in accordance with ASTM D 751, Grab Method.
 - 6. Heat Aging in accordance with ASTM D 3045: 176 °F for 56 days. No sign of cracking, chipping or crazing. (In accordance with ASTM D 4434).
 - 7. Factory Seam Strength: ≥ 417 lbf. in accordance with ASTM D 751, Grab Method.

3-Part Specification
Division 07 54 19 - Polyvinyl-Chloride Roofing

8. Tearing Strength: ≥ 132 lbf. (MD) and ≥ 163 lbf. (XMD) in accordance with ASTM D 751, Procedure B.
9. Low Temperature Bend (Flexibility): Pass at -40 °F in accordance with ASTM D 2136.
10. Accelerated Weathering: No cracking, checking, crazing, erosion or chalking after 5,000 hours in accordance with ASTM G 154.
11. Linear Dimensional Change: $< 0.5\%$ in accordance with ASTM D 1204 at 176 ± 2 °F for 6 hours.
12. Water Absorption: $< 1.7\%$ in accordance with ASTM D 570 at 158 °F for 166 hours.
13. Static Puncture Resistance: ≥ 56 lbs. in accordance with ASTM D 5602.
14. Dynamic Puncture Resistance: ≥ 14.7 ft-lbf. in accordance with ASTM D 5635.

D. Cool Roof Rating Council (CRRC):

1. Membrane must be listed on CRRC website.
 - a. Initial Solar Reflectance: $\geq 88\%$
 - b. Initial Solar Reflective Index (SRI): ≥ 111
 - c. 3-Year Aged Solar Reflectance: $\geq 68\%$
 - d. 3-Year Aged Thermal Emittance: $\geq 84\%$
 - e. 3-Year Aged Solar Reflective Index (SRI): ≥ 82

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Duro-Last data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
 4. Maintenance requirements.
- C. Shop Drawings: Indicate insulation pattern, overall membrane layout, field seam locations, joint or termination detail conditions, and location of fasteners.
- D. Verification Samples: For each product specified, two samples, representing actual 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: Contractor must be a Master Certified Installer. 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 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 wind uplift and fire hazard requirements.
- B. Fire Exposure: 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. Exterior Fire-Test Exposure:
 - a. Class A; ASTM E 108, for application and roof slopes indicated.
 - 2. Fire-Resistance Ratings: Comply with ASTM E 119 for fire-resistance-rated roof assemblies of which roofing system is a part.
 - 3. Conform to applicable code for roof assembly fire hazard requirements.
- C. Wind Uplift:
 - 1. Roofing System Design: Provide a roofing system designed to resist uplift pressures calculated according to the current edition of the ASCE-7 Specification *Minimum Design Loads 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.

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 positive drainage.
 3. No exclusion for damage caused by biological growth.
 4. Issued direct from and serviced by the roof membrane manufacturer.
 5. Transferable for the full term of the warranty.

PART 2 PRODUCTS

2.1 MANUFACTURER

3-Part Specification
Division 07 54 19 - Polyvinyl-Chloride Roofing

- A. Manufacturer: Duro-Last Roofing, Inc., 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 Roofing, Inc.
- C. ~~Substitutions: Not permitted.~~

2.2 ROOFING SYSTEM COMPONENTS

- A. Roofing Membrane: Duro-Last® PVC thermoplastic membrane conforming to ASTM D 4434, type III, fabric-reinforced, PVC, NSF/ANSI 347 Gold or Platinum Certification, and a product-specific third-party verified Environmental Product Declaration. Membrane properties as follows:
 - 1. Thickness:
 - a. 50 mil.
 - 2. Exposed Face Color:
 - a. Light Gray.
 - 3. Minimum recycle content 7% post-industrial and 0% post-consumer.
 - 4. Recycled at end of life into resilient flooring or concrete expansion joints.
- B. Accessory Materials: Provide accessory materials supplied by or approved for use by Duro-Last Roofing, Inc.
 - 1. Sheet Flashing: Manufacturer's standard reinforced PVC sheet flashing.
 - 2. Duro-Last Factory Prefabricated Flashings: manufactured using Manufacturer's standard reinforced PVC membrane.
 - a. Stack Flashings.
 - b. Curb Flashings.
 - c. Inside and Outside Corners.
 - 3. Sealants and Adhesives: Compatible with roofing system and supplied by Duro-Last Roofing, Inc.
 - a. Duro-Caulk® Plus.
 - b. Strip Mastic.
 - 4. Slip Sheet: Compatible with roofing system and supplied by Duro-Last Roofing, Inc.
 - 5. Fasteners and Plates: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane and insulation to substrate. Supplied by Duro-Last Roofing, Inc.
 - a. #14 Heavy Duty Fasteners.
 - b. Cleat Plates.
 - 6. PV Anchors
 - 7. Termination and Edge Details: Supplied by Duro-Last Roofing, Inc.
 - a. Termination Bar.
 - b. Universal 2-Piece Compression Metal System.
 - c. Snap Coping.

3-Part Specification
Division 07 54 19 - Polyvinyl-Chloride Roofing

8. Vinyl Coated Metal: Supplied by Duro-Last Roofing, Inc. 24 gauge, hot-dipped galvanized, grade 90 metal with a minimum of 17 mil of Duro-Last membrane laminated to one side.
 9. Two-Way Roof Vents: Supplied by Duro-Last Roofing, Inc. Install a minimum of 1 vent for each 1,000 ft² (93 m²) of roof area.
- C. Walkways:
1. Provide non-skid, maintenance-free walkway pads in areas of heavy foot traffic and around mechanical equipment.
 - a. Duro-Last Roof Trak® III Walkway Pad.
 - 1.

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.
- G. Prior to re-covering an existing roofing system, conduct an inspection of the roof system accompanied by a representative of the membrane manufacturer or an authorized contractor.
 1. Determine required fastener type, length, and spacing.
 2. Verify that moisture content of existing roofing is within acceptable limits.
 3. Identify damaged areas requiring repair before installation of new roofing.
 4. Conduct core cuts as required to verify information required.

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. Re-Roofing Over Existing Single Ply System:~~
 - ~~1. Remove all loose or high fasteners.~~
 - ~~2. Membrane contaminated with bitumen must be immediately cleaned. If cleaning does not remove the bitumen, the contaminated membrane must be replaced, or covered with both a slip sheet and new membrane.~~
 - ~~3. Blisters, buckles and other surface irregularities must be repaired or removed. If the damage is extensive, an approved rigid board insulation or a cover board must be installed.~~

3-Part Specification
Division 07 54 19 - Polyvinyl-Chloride Roofing

- ~~4. When the system is smooth or granular surfaced, any approved slip sheet, insulation or cover board may be used to provide separation of the roof system and new membrane. Duro-Guard fan folds may be used if the surface is pea gravel or crushed stone which is 1/4 to 3/8 inch in size and has been leveled and maintained at 4 psf. For larger rock/gravel, utilize an approved rigid insulation or cover board.~~
- ~~5. If rock/gravel surfacing is removed, an approved fan fold, rigid insulation or cover board must be used. If embedded rock/gravel remains that protrudes out of the deck more than 1/4 inch, do not use fan fold board. Instead, use an approved cover board or rigid insulation.~~
- ~~6. When installing polystyrene insulation over coal tar pitch or asphalt based roof systems, a slip sheet must be used between the insulation and existing roof.~~

3.3 INSTALLATION

- A. Install insulation in accordance with the roof manufacturer's requirements.
- B. Roof Membrane: 50 mil, Duro-Last® PVC thermoplastic membrane.
 1. Use only fasteners, stress plates and fastening patterns accepted for use by the roof manufacturer. Fastening patterns must meet the applicable design requirements.
 2. Install fasteners in accordance with the roof manufacturer's requirements. Fasteners that are improperly installed shall be replaced or corrected.
 3. Mechanically fasten membrane to the structural deck utilizing fasteners and fastening patterns that in accordance with the roof manufacturer's requirements.
 4. Cut membrane to fit neatly around all penetrations and roof projections.
 5. Unroll roofing membrane and positioned with a minimum 6 inch overlap.
- C. Seaming:
 1. Weld overlapping sheets together using hot air. Minimum weld width is 1-1/2 inches.
 2. Check field welded seams for continuity and integrity and repair all imperfections by the end of each work day.
- D. Membrane Termination/Securement: All membrane terminations shall be completed 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.
 2. Provide securement at any angle change where the slope or combined slopes exceeds two inches in one horizontal foot.
- 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.

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- 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:
1. Coordinate installation of roof drains and vents specified in Section 15146 - Plumbing Specialties.
 2. Remove existing flashing and asphalt at existing drains in preparation for sealant and membrane.
 3. Provide a smooth clean surface on the mating surface between the clamping ring and the drain base.
- 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 specified in Section 07620.
 4. Manufactured Roof Specialties: Coordinate installation of copings, counter flashing systems, gutters, downspouts, and roof expansion assemblies specified in Section 07710.
- 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.

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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