ADDENDUM NUMBER ONE
To Contract Documents for:
CLIVE PUBLIC SAFETY FACILITY
SVPA Project No. 19056

ARCHITECT AND INTERIOR DESIGNER:
SVPA ARCHITECTS INC.
1466 28th Street, Suite 200
West Des Moines, IA 50266
515.280.2401 FAX 515.327.5991
Contact: Pierce Coady, Project Architect
p-coady@svpa-architects.com

OWNER:
CITY OF CLIVE
1900 NW 114th Street
Clive, IA 50325

OWNER’S REPRESENTATIVE:
CHRISTENSEN DEVELOPMENT
215 East 3rd Street, Suite 300
Des Moines, IA 50309
515.528.9559
Contact: Angie Pfannkuch, Sr. Project Manager
angie@christensendevdevelopment.com

CONSTRUCTION MANAGER:
DCI GROUP
220 SE 6th Street, Suite 200
Des Moines, IA 50309
515.244.5043
Contact: Michael Steen, Senior Project Manager
michaels@dcigroup-us.com

LANDSCAPE ARCHITECT:
CONFLUENCE
525 17th Street
Des Moines, IA 50309
Contact: Matt Carlile
515.288.4874
mcarlile@thinkconfluence.com

CIVIL ENGINEER:
BISHOP ENGINEERING
3501 104th Street
Urbandale, IA 50322
515.276.0467
Contact: David Bentz: dbbentz@bishopengr.com
Or James Rodemeyer:
jrodemeyer@bishopengr.com

MEPT ENGINEER:
IMEG CORP.
2882 106th Street
Urbandale, IA 50322
515.334.9906
Contact:
Electrical: Kristen Spina,
kristen.l.spina@imegcorp.com
Mechanical: Keith Padgett,
Keith.M.Padgett@imegcorp.com

STRUCTURAL ENGINEER:
RAKER RHODES ENGINEERING
4717 Grand Avenue
Des Moines, IA 50312
515.277.0275
Contact: John Rhodes: jrhodes@rakerrhodes.com
Or Trevor Pullen: tpullen@rakerrhodes.com

ARCHITECTURAL CONSULTANT:
REDSTONE ARCHITECTS
2709 S. Telegraph Road
Bloomfield Hills, MI 48302
248.418.0990
Contact: Dan Redstone,
dredstone@redstonearchitects.com
Or Teffera Kowalske,
tkowalske@redstonearchitects.com

SVPA No. 19056
Clive Public Safety Facility
Clive, IA

ADDENDUM NO. 1
00 90 00-1
This addendum is issued to modify, clarify, or amend the original Project Manual and /or Drawings and is hereby made part of the Contract Documents dated August 27, 2020. The Contractor shall be responsible for incorporating the items in this Addendum to the Work. Attach this addendum to the Project Manual(s) in your possession. Acknowledge receipt of this Addendum by number where indicated on the Bid Form. Failure to do so may subject Bidder to disqualification. The following shall take precedence over anything to the contrary in the Project Manual, in the Drawings, or in prior Addenda.

This Addendum consists of (3) pages and the following attachments:
(3) Page Pre-Bid Meeting Minutes
(10) Page New Section 075401
(1) Full Size Revised Drawing MH501

PRE-BID MEETING

A virtual Pre-Bid Meeting was held on September 3, 2020. A copy of the meeting minutes is attached to this Addendum.

PRODUCT APPROVALS

Preliminary approvals of products are indicative of the general acceptability of the product based on the quality, manufacturer’s and representative’s integrity, availability of service and similar general considerations. Final approval will be contingent upon compliance with detailed Specifications.

<table>
<thead>
<tr>
<th>Section</th>
<th>Product</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>074243</td>
<td>Series 1000 Composite Wall Panels</td>
<td>ASI Custom Sheet Metal</td>
</tr>
<tr>
<td>096566</td>
<td>Activ Resilient Athletic Flooring</td>
<td>Regupol</td>
</tr>
<tr>
<td>096413</td>
<td>Hardside Acoustic Panels</td>
<td>Kinetics</td>
</tr>
<tr>
<td>23 34 23</td>
<td>Power Ventilators - HVLS Fans</td>
<td>SkyBlade Corp.</td>
</tr>
<tr>
<td>23 82 00</td>
<td>Electric Unit Heaters</td>
<td>Reed-I</td>
</tr>
<tr>
<td>23 82 00</td>
<td>Gas-Fired Radiant Tube Heaters</td>
<td>Advanced Radiant</td>
</tr>
<tr>
<td>23 34 16</td>
<td>Inline Centrifugal Fans</td>
<td>Soler &amp; Palau</td>
</tr>
<tr>
<td>23 34 24</td>
<td>Rooftop Exhaust Fans</td>
<td>Soler &amp; Palau</td>
</tr>
<tr>
<td>23 36 00</td>
<td>Air Terminal Units</td>
<td>Anemostat</td>
</tr>
<tr>
<td>23 37 00</td>
<td>Roof Hoods</td>
<td>Soler &amp; Palau</td>
</tr>
<tr>
<td>23 82 00</td>
<td>Electric Cab / Unit Heaters</td>
<td>Stelpro</td>
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<tr>
<td>23 82 00</td>
<td>Electric Cab / Unit Heater</td>
<td>Heatrex</td>
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NOT APPROVED

<table>
<thead>
<tr>
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<th>Product</th>
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<tr>
<td>102113</td>
<td>Hiney Hiders Toilet Compartments</td>
<td>Scranton Products</td>
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CHANGES TO THE PROCUREMENT DOCUMENTS

1. **Document 00 26 00 Procurement Substitution Procedures**
   A. Paragraph 1.4.A.1: Revise the substitution date requirement from “September 7, 2020” to “September 10, 2020”.
   B. Paragraph 1.4.A.2.b.3: Revise to read as follows:
      “3) Samples where applicable or when requested by Architect. The following products require sample submission in addition to the substitution request:
      a) Architectural precast panels for each finish specified
      b) Metal wall panels
      c) Composite wall panels
      d) Aluminum siding”
CHANGES TO THE SPECIFICATIONS

2. Section 07 54 00 Thermoplastic Polyolefin Membrane Roofing – Fully Adhered
   A. Delete this Section in its entirety.
3. Section 07 54 01 Induction Welded Thermoplastic Polyolefin Membrane Roofing
   A. Add this Section to the Contract Documents, attached to this Addendum.

CHANGES TO THE DRAWINGS

1. MH501 - VENTILATION SCHEDULES
   A. REVISE Unit Heater Schedule - Electric as shown on revised attached drawing MH501.

END OF ADDENDUM 01
Pre-Bid Meeting Minutes

MEETING DATE: 09/03/2020
MEETING TIME: 10:00 AM - 12:00 PM Central Time (US & Canada)

MEETING LOCATION:

VIDEO CONFERENCING LINK: https://us02web.zoom.us/j/85076790697

OVERVIEW:
Pre-bid conference for the City of Clive Public Safety Facility project.

NOTES:

ATTACHMENTS:

ATTENDEES:

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Phone Number</th>
<th>Email</th>
<th>Attendance</th>
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Introduction

<table>
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<th>Title</th>
<th>Assignment</th>
<th>Due Date</th>
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<td></td>
<td>Project Team</td>
<td></td>
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</tbody>
</table>

Description:

- Owner: City of Clive
- Owner's Rep: Christensen Development
- Architect: SVPA Architects
- Mech. Engineer: IMEG
- Civil Engineer: Bishop Engineering
- Landscape Designer: Confluence
- Structural Engineer: Raker Rhodes
- Construction Manager: DCI Group

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<th>No</th>
<th>Meeting Origin</th>
<th>Title</th>
<th>Assignment</th>
<th>Due Date</th>
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<td>1.2</td>
<td></td>
<td>Project Overview</td>
<td></td>
<td></td>
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</tbody>
</table>

Description:

- New construction of a 44,818 square foot facility located at 8800 Hickman Ave. The office portion of the facility will be 26,683 square feet, this includes the Fire Department sleeping quarters, open office spaces, personal offices, conference rooms, and training rooms. The Apparatus Bay is 7,450 square feet and includes a mezzanine for training. The Police garage is 10,395 square feet and includes indoor storage, booking, armory, and squad parking.
  - Alternate 01: Rooftop Solar Panels
  - Alternate 02: UV Lighting for HVAC

Official Documented Meeting Minutes:

- Please note that DCI Group (Construction Manager) will handle site fencing for the project.

<table>
<thead>
<tr>
<th>No</th>
<th>Meeting Origin</th>
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<th>Assignment</th>
<th>Due Date</th>
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<td>1.3</td>
<td></td>
<td>Bid Package Process</td>
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</table>

Description:

This RFB will result in one successful proposal per bid package.

These meeting minutes are believed to be an accurate reflection of those items discussed and the conclusions that were reached during the referenced meeting. Please contact if there are any discrepancies or questions with the content of these minutes.
Meeting #1

- Bid Package #1 – Excavation, Grading, Utilities & Ground Improvements
- Bid Package #2 – Concrete
- Bid Package #3 – Precast Concrete, Steel Supply, and Install
- Bid Package #4 – Framing, Drywall, Paint & Ceilings
- Bid Package #5 – Flooring & Tile
- Bid Package #6 – Electrical
- Bid Package #7 – Mechanical & Plumbing
- Bid Package #8 – Fire Suppression
- Bid Package #9 – Roofing
- Bid Package #10 – Aluminum Openings & Glazing
- Bid Package #11 – General Building Construction

### Bidding Schedule

<table>
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<tr>
<th>No</th>
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**Description:**

- Questions Due: 09/07/2020
  - All questions to be submitted to Michael Steen at michaelis@dcigroup-us.com
- Substitution Requests Due: 09/07/2020
- An Addendum will be issued to incorporate minutes from this Pre-Bid Meeting.
- Final Addendum will be issued no later than 09/15/2020 by 2:00pm CST, or 48 hours prior to bids being due.
- **BIDS DUE: 09/17/2020 at 2:00pm CST**
- Submit Bids to Clive City Hall, 1900 NW 114th Street, Clive
  - Tentative Bid Award: 09/24/2020
- **Official Documented Meeting Minutes:**
  - Addendum will be issued pushing the questions and substitution request deadlines to 09/10.
  - Also in the addendum will be the addition of a "request for samples" for a couple of specific products under the substitution request specification.

### Scope of Work Overview

<table>
<thead>
<tr>
<th>No</th>
<th>Meeting Origin</th>
<th>Title</th>
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<th>Due Date</th>
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</table>

**Description:**

- Procore will be the project management software used
  - No cost to the contractor
  - All submittals, RFIs, Change Orders, Invoicing, etc. will be done through Procore.
  - This project is tax-exempt

**Official Documented Meeting Minutes:**

- CAD files available upon request for earthwork contractors who may be interested. Reach out to Michael Steen — michaelis@dcigroup-us.com

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<thead>
<tr>
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</tbody>
</table>

**Description:**

- Site Logistics
  - Bid Package #11 to provide dumpster, porta potties, and hand washing stations for use by all Contractors.
  - General building permit, NPDES permit, and Signage permit will be obtained by the Owner. All other necessary permits shall be by the contractor.
  - Contractor Trailers

These meeting minutes are believed to be an accurate reflection of those items discussed and the conclusions that were reached during the referenced meeting. Please contact if there are any discrepancies or questions with the content of these minutes.
Temporary Utilities

Construction Schedule

- Anticipated construction timeline from October 2020 through October 2021.
- All contractors shall adhere to the initial schedule provided in the project documents.
- A pull-plan session will be held with the successful bid package contractors to confirm duration and finalize sequence.
- Milestone dates to be maintained.

- Submittals
  - Critical submittals include, but are not limited to, SWPPP, steel, precast, concrete, reinforcing, and site structures.
  - Coordination of embeds in precast and concrete will be critical to maintain schedule
  - Site specific safety plan

- Commissioning
  - Code required commissioning will be procured for this project

- Onsite Coordination
  - Onsite supervision by each bid package Prime Contractor is required at all times when work by that contractor or their subcontractors/suppliers is taking place.
  - Daily Logs, Safety Inspections, and Stand up Meeting requirements
  - All areas shall be cleaned daily and a "Nothing Hits The Floor" policy will be enforced.
  - Each Bid Package is responsible for accurate as-built construction records of their scope throughout the project.

- Closeout
  - Electronic closeout documents will be required per the project specifications.
  - These will be submitted electronically through Procore as closeout submittals.
  - Submittal of closeout documentation will begin prior to substantial completion.

**Official Documented Meeting Minutes:**

- Staging onsite will be limited. Contractor trailers shall be coordinated and approved by the Construction Manager. Each contractor is responsible for coordination and the expense for connecting utilities to their job trailer is needed.

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**Open Discussion**

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<thead>
<tr>
<th>No</th>
<th>Meeting Origin</th>
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<td>Questions</td>
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</tbody>
</table>

**Official Documented Meeting Minutes:**

Q: Is the initial schedule available?
A: Yes, see spec section 00 42 10 Preliminary Schedule

Q: Is the list of Earthwork contractors available?
A: Current plan holders from Action Reprographics is available on their website.

These meeting minutes are believed to be an accurate reflection of those items discussed and the conclusions that were reached during the referenced meeting. Please contact if there are any discrepancies or questions with the content of these minutes.
SECTION 07 54 01
INDUCTION WELDED THERMOPLASTIC POLYOLEFIN MEMBRANE ROOFING

PART 1 - GENERAL CONDITIONS

PERFORMANCE REQUIREMENTS

A. Install a watertight sheet membrane and base flashing roofing system that will not permit passage of liquid water and will withstand wind loads, thermally induced movement, and exposure to weather without failure.

SUBMITTALS

A. Product Data: For each roofing product indicated. Include research/evaluation reports.

B. Shop Drawings: Include details of base flashings, membrane terminations, and tapered insulation.

C. Samples: For each product included in membrane roofing system.

CLOSEOUT SUBMITTALS

A. Maintenance Data.

B. Warranties as specified elsewhere in this Section.

QUALITY ASSURANCE

A. FM Global Listing: Roofing, base flashings, and component materials shall comply with requirements in FM Global 4450 or FM Global 4470 as part of a built-up roofing system, and shall be listed in FM Global's "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.

1. Fire/Windstorm Classification: Class 1A-90. Fire classification to comply with ASTM E108 for application and slopes indicated.
   a. Comply with ASHRAE Zone 2012 IECC R=25

2. Hail-Resistance Rating: MH.

B. Installer Qualifications: A qualified installer, approved by manufacturer to install manufacturer's product; and who is eligible to offer Roofing Manufacturers standard labor and material warranty without monetary limit, NDL type warranty. Installer to have 5 years experience with membrane manufacturer and system. Installer to have completed five projects of similar size or scope. Membrane manufacturer to have specified systems in place to match or exceed warranty length specified.

C. Preinstallation Conference: Conduct conference at Project site. Manufacturer's Technical Inspector to be in attendance.

D. Manufacturer's Technical Inspector to provide twice monthly inspections and be on site to close out project prior to installer leaving project.
September 4, 2020

PRE-INSTALLATION CONFERENCE

A. Conduct Pre-Installation Conference in accordance with Section 01 31 00 Project Management and Coordination.

WARRANTY

A. Special Warranty: Manufacturer's standard form, without monetary limitation and signed by manufacturer, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leak.
   1. Warranty period: 20 year Total System Warranty from date of Substantial Completion.

B. Special Project Warranty: Submit roofing installer's warranty covering Work of this Section, including all components of membrane roofing system such as roofing membrane, base flashing, roof insulation, fasteners, adhesives, cover boards, substrate boards, vapor retarders, sheet metal and walkway products, for the following warranty period:
   1. Warranty period: 2 years from date of Substantial Completion.

JOB CONDITIONS

A. Roofing materials may be installed under certain adverse weather conditions but only after consultation with Membrane manufacturer, as installation time and system integrity may be affected.

B. Only as much of the new roofing as can be made weathertight each day, including all flashing and detail work, shall be installed. All seams shall be cleaned and heat welded before leaving the job site that day.

C. Schedule and execute all work without exposing interior building areas to effects of inclement weather.

D. All surfaces to receive new insulation, membrane or flashings are to be dry. Should surface moisture occur, provide necessary equipment to dry surface prior to application.

E. Secure all new and temporary construction, including equipment and accessories to preclude wind blow-off and subsequent roof or equipment damage.

F. Install uninterrupted waterstops at end of each day's work. Completely remove before proceeding with next day's work. Waterstops not to emit dangerous or unsafe fumes or remain in contact with finished roof as installation progresses. Replace contaminated membrane at no cost to the Owner.

G. The Applicator is cautioned that certain roofing membranes are incompatible with asphalt, coal tar, heavy oils, roofing cements, creosote and some preservative materials and such materials are not to remain in contact with membranes. Consult Membrane manufacturer regarding compatibility, precautions and recommendations.

H. Arrange work sequence to avoid use of newly constructed roofing as walking surface or for equipment movement and storage. Where such access is absolutely required, provide all necessary protection and barriers to segregate work area and prevent damage to adjacent areas. Provide substantial protection layer consisting of plywood over plywood over insulation board placed on tarps for all new and existing roof areas that receive rooftop traffic during construction.
I. Prior to and during application, remove all dirt, debris and dust from surfaces by vacuuming, sweeping, blowing with compressed air or similar methods.

J. Follow all safety regulations as required by OSHA and other applicable authority(s) having jurisdiction.

K. Collect scrap roof membrane for return to manufacturer for recycling. Deposit other roofing waste material in appropriate refuse containers.

L. Take precautions that storage and application of materials and equipment does not overload roof deck or building structure.

M. Do not store or use flammable adhesives and deck primers in vicinity of open flames, sparks and excessive heat.

N. Report all rooftop contamination that is anticipated or that is occurring to Membrane manufacturer to determine corrective steps to be taken.

O. Verify that all roof drain lines are functioning correctly (not clogged or blocked) before starting work. Report any blockages in writing (letter copy to Membrane manufacturer) to Owner's Representative for corrective action prior to installation of Membrane manufacturer roof system.

P. Immediately stop work if any unusual or concealed condition is discovered and immediately notify Owner of condition in writing for correction (letter copy to Membrane manufacturer).

Q. Complete site cleanup, including both interior and exterior building areas that have been affected by construction, to Owner's/Architects' satisfaction.

R. Repair all landscaped areas damaged by construction activities at no cost to Owner.

S. Conduct fastener pullout tests in accordance with latest version of SPRI/ANSI Fastener Pullout Standard to verify condition of deck/substrate and to confirm expected pullout values.

T. Do not install roofing membrane under following conditions without consulting Membrane manufacturer's Technical Dept. for precautionary steps:
   1. Roof assembly permits interior air to pressurize membrane underside.
   2. Any exterior wall has 10 percent or more of surface area comprised of opening doors or windows.
   3. Wall/deck intersection permits air entry into wall flashing area.

U. Take precautions when using adhesives at or near rooftop vents or air intakes. Coordinate operation of vents and air intakes to avoid intake of adhesive odor while ventilating building. Keep lids on unused cans at all times.

V. Wear protective wear when using solvents or adhesives or as required by job conditions.

W. Roofing and steel deck membranes are slippery when wet or covered with snow, frost, or ice. Working on surfaces under these conditions is hazardous. Appropriate safety measures must be implemented prior to working on such surfaces. Always follow OSHA and other relevant fall protection standards when working on roofs.
PART 2 - PRODUCTS

2.1 MEMBRANE

A. Polyester reinforced Thermoplastic Poly-Olefin (TPO): Uniform, flexible elastomer sheet formed from a laminated core and highly UV resistant top ply with a non-woven polyester scrim reinforcement. Minimum thickness to be verified by officer of system manufacturer involved directly with membrane production

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. GAF Materials Corporation: EverGuard Extreme 70 mil TPO.
   b. Firestone Building Products: UltraPly 80 mil TPO.
   c. Johns Manville Building Materials: JM TPO 80 mil TPO
   d. Versico Versiweld.
   e. Substitutions: Allowed in accordance with Section 00 26 00.

B. Membrane shall conform to ASTM D6878, "Standard for Thermoplastic Poly-Olefin Membrane".

C. Color of Membrane: Light grey.

D. Typical Physical Properties

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<th>Parameters</th>
<th>ASTM Test Method</th>
<th>Minimum Requirement</th>
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<tr>
<td>Nominal Thickness, min., inches (mm)</td>
<td>D751</td>
<td>0.070</td>
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<tr>
<td>Elongation at Break, min. (machine x transverse)</td>
<td>D751</td>
<td>370 lbf x 330 lbf</td>
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<tr>
<td>Seam strength(2), min. (% of tensile strength)</td>
<td>D751</td>
<td>150 lbf (membrane failure)</td>
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<td>Retention of Properties After Heat Aging</td>
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<tr>
<td>Tensile Strength, min., (% of original)</td>
<td>D3054</td>
<td>100%</td>
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<tr>
<td>Elongation, min., (% of original)</td>
<td>D3054</td>
<td>100%</td>
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<tr>
<td>Tearing Strength, min., lbf (N)</td>
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<td>65 lbf x 130 lbf</td>
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<td>Accelerated Weathering Test (Xenon Arc)</td>
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<td>Crazing (7 x magnification)</td>
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<tr>
<td>Linear Dimensional Change</td>
<td>D1204 @ 158º F, 6 hrs.</td>
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<td>Emissivity (white)</td>
<td>C1371</td>
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2.2 FLASHING MATERIALS

A. Wall/Curb Flashing
1. Manufacturers standard reinforced flashing membrane
   A polyester reinforced membrane adhered to approved substrate using Manufacturers approved adhesive, minimum thickness 50 mils.

B. Auxiliary Flashing Materials: Recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
   1. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, thickness, and color as sheet membrane.
      a. Provide TPO-clad flashing at locations noted on Drawings.
   2. Cone and pipe vents: Manufacturer’s standard preformed flashings designed to accommodate various sizes of vents and pipe penetrations.
   3. Formed flashings: manufacturer’s standard T-joint covers, inside and outside formed corners, and penetration pockets with 2-part pourable sealant.
   4. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.
   5. Compression Bars: Metal termination bars, metal battens, fasteners, termination reglets, and other accessories.

2.3 ROOF INSULATION

A. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, 20 psi, felt or glass-fiber mat facer on both major surfaces. R=30 min. Not less than 5.2 inches.

B. Taped Insulation: Provide factory-tapered polyisocyanurate insulation boards fabricated to slope of 1/4 inch per 12 inches, unless otherwise indicated.

C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

D. Horizontal Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch thick, factory primed, equivalent to Georgia-Pacific Dens Deck.
   1. Provide 1/2 inch cover board of same material over insulation.

2.4 ATTACHMENT COMPONENTS

A. Rhinobond induction welded system:
   2. Manufacturer’s standard #15 thread fastener for securing into steel deck types, and standard #14 thread fastener for securing into concrete and wood deck types.

B. Roofing Membrane manufacturers Multi-Purpose Sealant (for termination details).

2.5 WALKWAY PADS

A. Walkway Pads: Factory-formed, nonporous, heavy-duty, solid-rubber, slip-resisting, surface-textured walkway pads, approximately 3/16 inch thick, and acceptable to roofing system manufacturer.
2.6 MISCELLANEOUS ACCESSORIES

A. Sealing Tape Strip: Compressible foam with pressure-sensitive adhesive on one side. Used with metal flashings as preventive measure against air and wind blown moisture entry.

B. Multi-Purpose Tape: High performance sealant tape used with metal flashings as preventive measure against air and wind blown moisture entry.

C. Perimeter Warning Tape: Designed for use on TPO membranes as reflective, highly visible pressure sensitive tape used to draw attention to roof perimeters and potential hazardous areas.

2.7 MISCELLANEOUS FASTENERS AND ANCHORS

A. All fasteners, anchors, nails, straps, bars, etc: Post-galvanized steel, aluminum or stainless steel. Mixing metal types and methods of contact shall be assembled to avoid galvanic corrosion.
   1. Fasteners for attachment of metal to masonry: Expansion type fasteners with stainless steel pins.
   2. Concrete fasteners and anchors: Approved for use by fastener manufacturer with minimum embedment of 1-1/4 inch.
   3. Deep buttress thread fasteners required for fastening insulation to deck; see Part 3 - Execution.
   4. Miscellaneous wood fasteners and anchors used for flashings: Approved for use by fastener manufacturer with minimum embedment of 1 inch.

PART 3 - EXECUTION

3.1 PROTECTION

A. GENERAL CONTRACTOR: to be responsible for protecting ALL existing roof membrane while mechanical work is completed.
   1. This protection needs to be coordinated between the Mechanical Contractor and the Roofing Contractor, so it shall be coordinated and monitored by the General Contractor:
   2. Protection is defined as: Canvas Tarps and ¼" Masonite over the roof membrane in ALL work areas.

3.2 SUBSTRATE INSPECTION

A. Applicator shall be responsible for acceptance or provision of proper substrate to receive new roofing materials.

B. Substrate to be dry, clean smooth, free of flaws, sharp edges, loose and foreign material, oil and grease. Confirm substrate compatibility. Begin work only after defects have been corrected.
   Commencement of work indicates applicator's acceptance of substrate.
   1. All roof surfaces shall be free of water, ice and snow.

C. Applicator: Inspect substrate for defects such as excessive surface roughness, contamination, structural inadequacy, or any other condition that will adversely affect quality of work.

D. Applicator shall verify that the work done under related sections meets the following conditions:
   1. Roof drains and/or scuppers have been reconditioned and/or replaced and installed properly.
   2. Roof curbs, nailers, equipment supports, vents and other roof penetrations are properly secured and prepared to receive new roofing materials.
3.3 WOOD NAILER INSTALLATION

A. Install wood nailers at perimeter of entire roof and around roof projections and penetrations.

B. Anchor nailers to structural elements to resist minimum force of 300 pounds per lineal foot in any direction.
   1. Individual nailer lengths: Not less than 3 feet long.
   2. Fastener spacing: No more than 12 inches on center or at distance to match structural framing. Stagger fasteners 1/3 the nailer width and installed within 6 inches of each end. Two fasteners shall be installed at ends of nailer lengths. Meet current ANSI 7 fastener spacing requirements.

C. Thickness: As required to match total substrate and insulation height to allow smooth transition.

D. Use stainless steel, corrosion resistant, fasteners when mechanically attaching any membrane to wood nailers and wood products treated with ACQ (Alkaline copper Quaternary). When ACQ treated wood is used on steel roof decks or with metal edge detailing, separation layer between the metal and ACQ treated wood is required.

3.4 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 (150 mm) 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.
   3. Cut and fit cover board tight to nailers, projections, and penetrations.
   4. Loosely lay cover board over substrate.
   5. Adhere cover board to substrate using adhesive according to FM Approvals' RoofNav assembly requirements and FM Global Property Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification, as follows:
      a. Set cover board in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F (14 deg C) of equiviscous temperature.
      b. Set cover board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
      c. Set cover board in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

B. Install slip sheet over cover board and beneath roof membrane.

3.5 INSULATION INSTALLATION

A. Install according to insulation manufacturer's instructions.

B. Top layer of insulation is the membrane underlayment, with edges butted together having no gaps greater than 1/4 inch (6mm).

C. Neatly cut insulation to fit around penetrations and projections; gaps not to exceed 1/4 inch.

D. If applicable, install tapered insulation around drains creating drain sump.
E. Do not install more insulation board than can be covered with membrane by end of day or onset of inclement weather.

F. Use at least 2 layers of insulation when the total insulation thickness for overlayment exceeds 2-1/2 inches. Stagger joints at least 12 inches between layers.

G. Mechanical Attachment .
   1. Mechanically fasten insulation to structural deck with approved deep buttress thread fasteners (if cover board not installed) and RhinoBond according to insulation manufacturer recommendations for fastening rates and patterns. Quantity and locations of fasteners and plates to cause insulation boards to rest evenly on roof deck/substrate. Install each insulation board tightly against adjacent boards on all sides.
   1. Fasten the insulation in 2 by 2 foot or 2 by 3 foot grid pattern according to Membrane manufacturer and wind design requirements. Fasteners must be tight enough that the plate does not turn, but not so tight as to deform the plate. Fastener pattern to provide 90 MPH wind speed warranty.
   2. Perimeter and Corner Areas: Determined by building height and width and other conditions according to ASCE 7 guidelines, manufacturer Technical or FM LPDS 1-29 if insured by Factory Mutual. To meet perimeter and corner uplift requirements, increase fastener density by decreasing spacing between fastener points in one or both directions. Total tributary area to each fastener: no more than 60 percent for perimeter and 40 percent for corners, based on the field of roof fastening density.
      a) Perimeter area: Outer boundary of roof. If roof is broken into different levels, treat each roof area as individual roof with its outer boundary being treated as perimeter. Typically, internal expansion joints and firewalls are not considered to be full perimeters. Refer to Factory Mutual's Data Sheet 1-28 for more information. Determine fastener pattern to meet FM1-90 .
      a) Ridge area: High point in roof area formed by two intersecting planes. When sum of slopes is minimum of 4 inches in 12 inches (30 degrees), treat each side of ridge as a perimeter area.

3. Install fasteners consistently in accordance with fastener manufacturer's recommendations. Minimum penetration: 1 inch through structural deck.
4. Use fastener tools with depth locator and torque-limiting attachment as recommended or supplied by fastener manufacturer to ensure proper installation.

3.6 INSTALLATION OF MEMBRANE

A. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

B. Unroll membrane over installed Rhinobond plates, allow membrane to fully relax.

C. Using the OMG portable induction welding tool, induction bond plates to the underside of the relaxed membrane. After performing a weld, quickly place a cooling magnet centered on the welded rhinobond plate. Allow the cooling magnet to stay in place for a minimum of 6 seconds before removing it. Repeat this process for induction bonding all plates to the membrane.

D. Apply membrane roofing with side laps shingled with slope of roof deck where possible.

E. Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.
   1. Test lap edges with probe to verify seam weld continuity. Apply sealant to seal cut edges of sheet membrane. Lap sealant may not be excluded in warranty.
2. Verify field strength of seams a minimum of twice daily (AM startup and mid-day) and repair
seam sample areas. Date and store test samples for Manufacturer’s Field Representative,
Owner, and Architect.
3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.
4. Areas and details hot air welded by hand should be checked for strength and consistency on
a daily basis.

F. Install sheet flashings and preformed flashing accessories and adhere to substrate according to
roofing system manufacturer’s written instructions.
1. Flash penetrations and field-formed inside and outside corners with sheet flashing as
recommended by manufacturer.
2. Clean seam areas, overlap sheets, and firmly roll flashings into the adhesive. Weld side and
end laps to ensure a watertight seam installation.
3. Test lap edges with probe to verify seam weld continuity. Apply lap sealant and seal exposed
edges of sheet flashing terminations.
4. Terminate and seal top of sheet flashings and mechanically anchor to substrate through
termination bars.

3.7 HOT- AIR WELDING OF SEAM OVERLAPS

A. General
1. All seams shall be hot-air welded. Seam overlaps should be 1.5” wide when automatic
machine-welding and 2” wide when hand-welding.
2. All membrane to be welded shall be clean and dry.

B. Hand-Welding: Hand-welded seams shall be completed in two stages. Hot-air welding equipment
shall be allowed to warm up for at least one minute prior to welding.
1. The back edge of the seam shall be welded with a narrow but continuous weld to prevent loss
of hot air during the final welding.

3.8 FLASHINGS

A. Metal details, fabrication practices and installation methods shall conform to the applicable
requirements of the following:
1. Factory Mutual Loss Prevention Data Sheet 1-49 (latest issue).
2. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA)

B. Metal flashings shall be securely fastened into solid wood blocking. Fasteners shall penetrate the
wood nailer a minimum of 1 inch (25 mm).

C. Airtight and continuous metal hook strips are required behind metal fascias. Hook strips are to be
fastened 12 inches (0.3 m) on center into the wood nailer or masonry wall.

D. Counter flashings shall overlap base flashings at least 2 inches.

E. Hook strips shall extend past wood nailers over wall surfaces by 1-1/2 inch (38 mm) minimum and
shall be securely sealed from air entry.

3.9 PERIMETER WARNING TAPE

A. Areas of membrane where tape is to be applied must be cleaned to a “like new” condition. Failure
to properly clean the membrane will result in less than satisfactory adhesion. The membrane
should be cleaned as follows:
1) New membrane: Remove loose dirt and dust by wiping clean with water. For areas where dirt is embedded, scrub the application area with a commercial cleaner such as Simple Green, 409 or other similar all purpose cleaner using a Scotch Brite scrubbing pad or similar product. Wash away residual cleaning material with clean water.

B. After surface is clean and dry, apply tape to surface taking care to avoid trapping air and creating blisters as tape is smoothed over with hand pressure. If a chalk line is used be sure to keep chalk dust clear of application area.

C. Do not apply Perimeter Warning Tape to surfaces where the temperature is below 40 degrees Fahrenheit.

3.10 WALKWAY INSTALLATION

A. Walkways: Install walkway pads at all roof access points and locations indicated. Heat weld walkway pads to substrate according to roofing system manufacturer's written instructions.

3.11 CLEAN UP

A. Do not allow trash, waste, or debris to collect on the roof. These items shall be removed from the roof on a daily basis.

B. All tools and unused materials must be collected at the end of each workday and stored properly off of the finished roof surface and protected from exposure to the elements.

C. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking, counter flashings, and terminations.

D. Properly clean the finished roof surface after completion, and make sure the drains and gutters are not clogged.

E. Clean and restore all damaged surfaces to their original condition.

3.12 COMPLETION

A. Prior to demobilization from site, Owner's Representative and Applicator to review work. Itemize all defects noted and non-compliances with Specifications or recommendations of Membrane manufacturer in a punch list. Applicator to correct items immediately to satisfaction of Owner's Representative and Membrane manufacturer prior to demobilization.

END OF SECTION 07 54 01