

CPCC ENGINEERING PACKAGE

EP No: ECR-25-001621 Rev 01

EP Title: MO720 and MO721 New Roof Installation

Document Action Only Physical Modification Drawing Change Only WPE

1.0 PACKAGE DESCRIPTION			
Request and Justification: CPCCo is replacing MO720 and MO721 entire roof membrane. The existing roof membrane has reached its lifespan, and it is now starting to fail, allowing water intrusions into the facilities. High wind across the site is also causing the roof to lift off in certain areas of the rooftop. The rooftop membrane is required to be replaced as soon as possible to prevent additional water intrusion. This is a Work Package Engineering (WPE) and follows the WPEP process described in CPCC-PRO-EN-20050, Section 3.9. Revision 01: Requires 90-mil membrane to be installed as indicated on construction sketches, SK-01 & SK-02.	Project No: N/A		
	Work Package No: 2X-25-07200		
Area: 200W	Facility: FPM	Building: MO720, MO721	System ID: FPM-C/S/A
Change Description and Scope: This WPE (ECR-25-001621) provides instructions and a layout of each facility rooftop where membrane is to be replaced. The contractor performing the installation of new roof membrane is responsible to install all roof material per manufacturers installation instructions. See VI-01. The scope includes the following: -Prepare the entire roof area for installation of new roof membrane and roof material as applicable. -Remove existing roof membrane and other roof material as applicable. Note: The roof decking of each facility shall be cleaned from all roof debris and/or nailing/screws that could cause damage to new roof membrane. -Install new roof membrane and/or roof materials per manufacturers specification installation instructions: Note: See attached new roof membrane to be installed, VI-01 attachment. -Upon installation of all roof material, the contractor is responsible to ensure roof area is completely cleaned from all construction debris and/or equipment. Revision 01: Requires 90-mil membrane to be installed as indicated on construction sketches, SK-01 & SK-02.			

RELEASE Radiological Record



Release
 Work Complete

Design Authority

2.0 PACKAGE INDEX					
Action	Document No.	Rev. No.	E/S/R	Section Description/Title	Page No.
I-Information	A-6004-795	7	-	Structural Design Verification Form, Sh 1-2	4-5
I-Information	MO721 PHOTO-01	0	-	PHOTO-01, Sh 1	6
I-Information	MO720 PHOTO-02	0	-	PHOTO-02, Sh 1	7
I-Information	SK-01	0	-	MO721 Construction Sketch, SK-01, Sh 1	8

I-Information	SK-02	0	-	MO720 Construction Sketch, SK-02, Sh 1	9
I-Information	VI-01	0	-	Roof Membrane Manufacturer Specification, Sh 1-2	10-11

3.0 DESIGN REQUIREMENTS

Functional Requirements:

- Remove existing roof membrane and all other associated material.
- Clean roof area for full installation of new roof membrane.
- As per VI-01, provide and install new 90-mil membrane and all associated materials (e.g. nails, screws, bonding material, etc.). No membrane substitution is acceptable.
- Upon full installation of new membrane, clean entire roof area from construction debris and/or equipment.
- Contractor shall provide 90-mil membrane as specified on page 10 of the ECR and/or on VI-01 Sh-1.

Revision 01:

Requires 90-mil membrane to be installed as indicated on construction sketches, SK-01 & SK-02.

Design Criteria:

- NFPA 101 (2018) Life Safety Code.
- CPCC-PRO-EN-097 Engineering Design and Evaluation (Natural Phenomena Hazard)
- IBC (2018) International Building Code
- DOE-STD-1020-2012 Natural Phenomena Hazard Analysis and Design Criteria for DOE Facilities
- ASCE 7-16 American Society of Civil Engineers

Hazard Analysis/Requirements:

- Standard industrial hazards while equipment/material is being removed and/or installed.
- Roof access shall be performed per site fall hazards evaluation and/or site controls (Evaluation and/or controls not part of this ECR).

4.0 ACCEPTANCE CRITERIA and METHODS

Acceptance Criteria	Acceptance Method
DA and/or Structural Engineer designee inspection	<input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Testing

5.0 RELATED/AFFECTED ECRs/FMPs AND OTHER AFFECTED DOCUMENTS

Document Type	Document No.	Rev. No.	Owning Organization	Technical Authority
N/A	N/A	N/A	N/A	N/A

6.0 DESIGN VERIFICATION

Verification by: Peer Review Formal Design Review Alternate Calculations Qualification Testing

The following verification(s) have been performed per the requirements of CPCC-PRO-EN-8336, Design Verification and the design is adequate and satisfactorily implements the stated design requirements. Design verification record (site form A-6004-795 or equivalent) is attached.

Verification Scope	Design Verifier
Structural	H7907634 - TAHA S QURESHI 3/12/2026 7:20:44 AM

7.0 REVIEWS

USQ: USQ GCX No: Per CPCC-PRO-NS-062, Sect. 1.3 Not Required
H5263573 - LUPE GONZALEZ 3/12/2026 7:25:52 AM

Reviewer Print Name	Signature	Date
Environmental: <input type="checkbox"/> Screened	Ref:	<input checked="" type="checkbox"/> Not Required
<u>H3929107 - MORGAN M MATSON</u>	<u>3/16/2026 7:24:01 AM</u>	
ECO Print Name	Signature	Date

8.0 APPROVALS and DISTRIBUTION

Approvals		
<u>H5263573 - LUPE GONZALEZ</u>	<u>3/16/2026 10:30:22 AM</u>	
EP Author: Print Name	Signature	Date
<u>H5263573 - LUPE GONZALEZ</u>	<u>3/17/2026 12:06:55 PM</u>	
Design Authority: Print Name	Signature	Date
<u>H2139501 - PATRICK J BARNES</u>	<u>3/17/2026 12:08:51 PM</u>	
Engineering Manager: Print Name	Signature	Date
<input checked="" type="checkbox"/> <u>Not Required</u>		
DOE Number:		
DOE Approval: Print Name	Signature	Date
<u>H5457683 - BRADEN L SWANEY</u>	<u>3/17/2026 12:20:46 PM</u>	
Title: Fire Protection Print Name	Signature	Date
Title: Print Name N/A	Signature	Date
Title: Print Name	Signature	Date
Title: Print Name	Signature	Date
Title: Print Name	Signature	Date
Distribution		
HID	Name	
5263573	Gonzalez, Lupe	
0066976	Klinetobe, Brett A	
4917736	Cooper, Betty V	
2139501	Barnes, Patrick J	
3929107	Matson, Morgan M	
7907634	Qureshi, Taha S	
0045842	Brist, Larry D	
0735885	Nicole D. Cutler	
5457683	Swaney, Braden L	

Central Plateau Cleanup Company (CPCCo)
DESIGN VERIFICATION RECORD

SECTION 1:

Document/Package To Be Verified:

ECR-25-001621 Rev. 01

Design Originator: Lupe Gonzalez

Scope: Installation of new roof membrane

Safety Class

Safety Significant

General Service

Peer (*Independent*) Review

Alternate Calculation

Qualification Testing

Formal Design Review

SECTION 2: (To Be Completed by Design Verifier)

Results of Verification:

DESCRIPTION	YES	NO	N/A*
Are the Functional Requirements, Design Criteria, inputs and assumptions appropriately selected?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reviewed Documents/Comments: The functional requirements, design criteria and inputs are appropriately selected based on field conditions and refer to section 3.0 in this ECR-25-001621 Rev. 01.			
Are assumptions necessary to perform the design activity adequately described and reasonable?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reviewed Documents/Comments: This ECR does not take any assumptions into account, as the installation of the new roof membrane will be similar to the existing membrane.			
Does the design meet the stated assumption, functions, requirements, and design criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reviewed Documents/Comments: The design meet the functions, requirements, and design criteria outlined in the provided sketches, as outlined in section 3.0 of this ECR-25-001621 Rev. 01.			
Where necessary, are the assumptions that require subsequent re-verifications when the detailed design activities are completed, identified?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reviewed Documents/Comments: This ECR does not take any assumptions into account, as the installation of the new roof membrane will be similar to the existing membrane.			
Are appropriate design methods and computer programs used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reviewed Documents/Comments: Yes, detailed sketches created using Adobe Acrobat software.			
Were the design inputs correctly incorporated into the design?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reviewed Documents/Comments: Yes, walkdowns were conducted to obtain the necessary information.			
Is the design output reasonable compared to design inputs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reviewed Documents/Comments: Yes			
Are the necessary design input and verification requirements for interfacing organizations specified in the design document or in implementing documents?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reviewed Documents/Comments: No design documents required other than what it is included this ECR-25-001621 Rev. 01 and the Vendor specifications.			
Have suitable materials, parts, and processes, been specified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Central Plateau Cleanup Company (CPCCo)
DESIGN VERIFICATION RECORD (Continued)

DESCRIPTION	YES	NO	N/A*
Reviewed Documents/Comments: The installation of new roof membrane is responsible to install all roof material per manufacturers installation instructions as per section 1.0 on this ECR-25-001621 Rev. 01 and the attached vendor specifications.			
Have suitable inspection, acceptance, and testing criteria been specified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reviewed Documents/Comments: Yes, inspection and acceptance have been identified Section 4.0 on this ECR-25-001621 Rev. 01. No testing criteria is applicable.			
Are all affected design documents identified and appropriately changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reviewed Documents/Comments: There are no design documents that require updating.			
Have constructibility, maintenance, and operability been adequately addressed in the design?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reviewed Documents/Comments: Constructibility and operability have been adequately addressed in this design.			

***NOTE: All questions answered N/A shall have justification provided in the comments**

Comments, Errors, or Deficiencies Identified: Yes No

Verification Performed By: (Design Verifier/Review Chairman)

_____ Taha Qureshi
 Print First and Last Name

Qureshi, Taha S Digitally signed by Qureshi, Taha S
Date: 2026.03.12 07:16:30 -07'00'

 Signature

SECTION 3: RESOLUTION

Resolution of Comments, Errors, or Deficiencies:
 N/A

Resolution Provided By: NA

_____ *Print First and Last Name*

_____ *Signature*

Resolution Accepted By: NA

_____ *Print First and Last Name*

_____ *Signature*

MO721, PHOTO-01



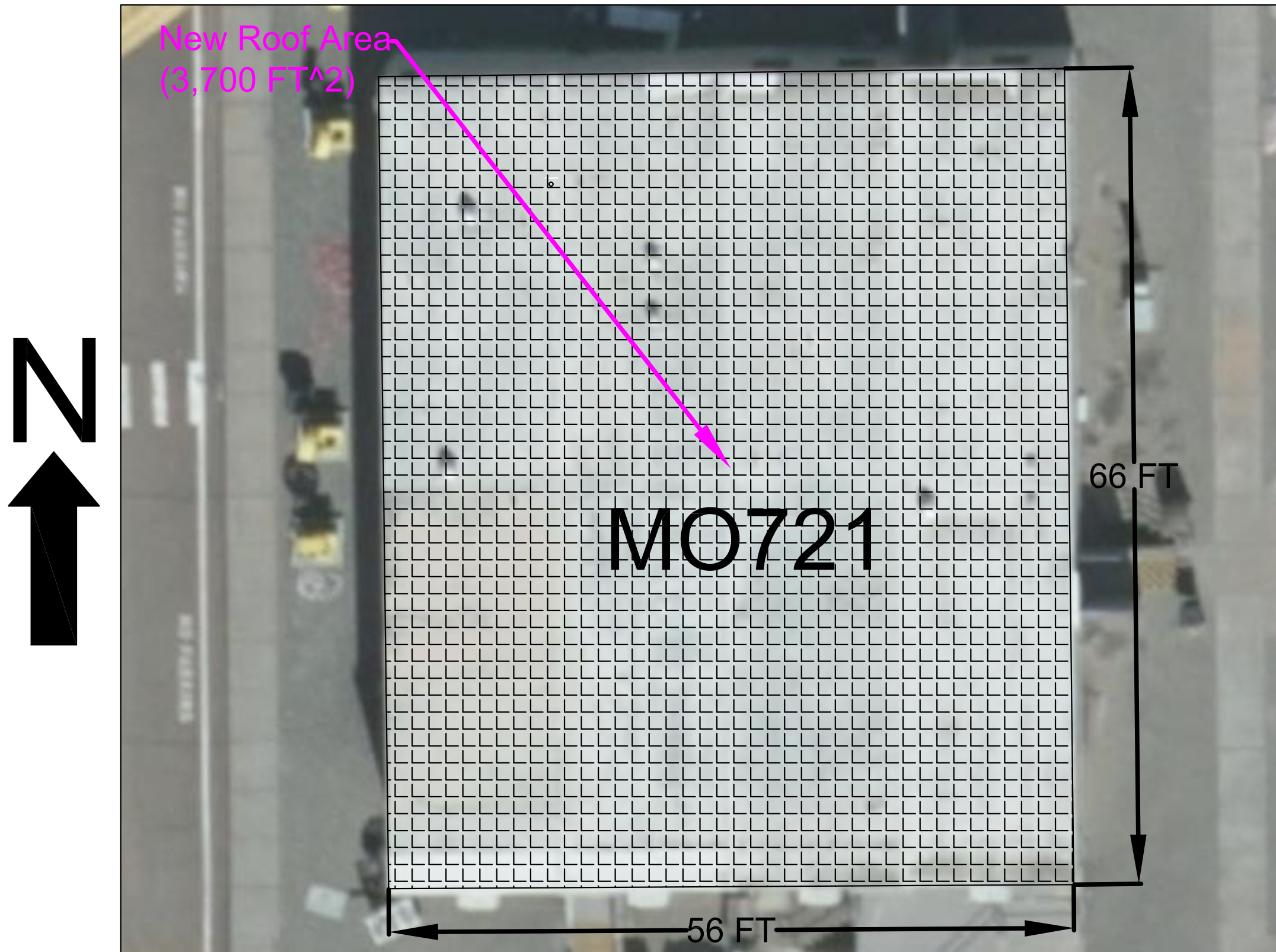
Current Damaged Area,
Patched temporary
(View Before Patching).
Northwest Corner

MO720, PHOTO-02

Current Area
Damaged by Wind.



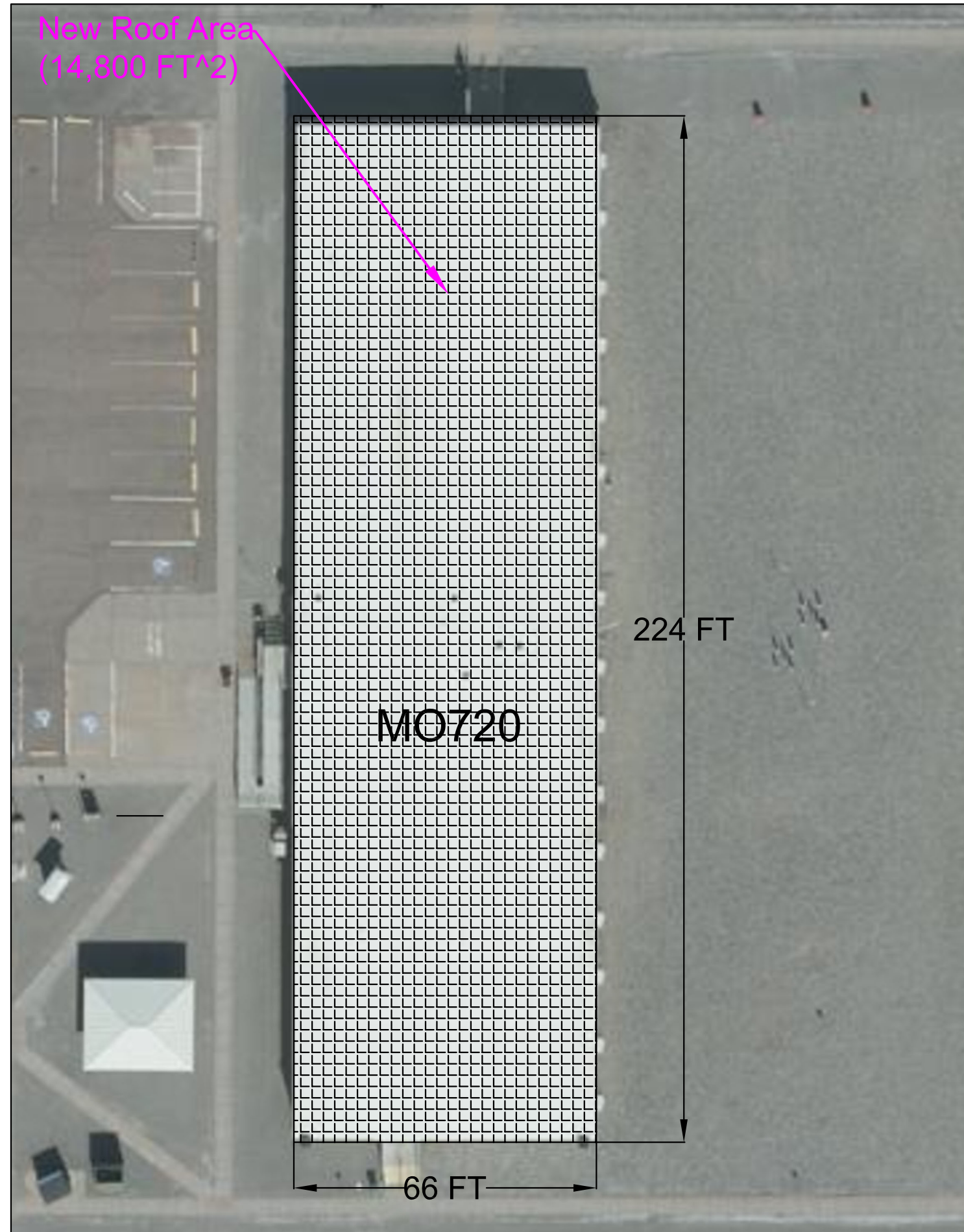
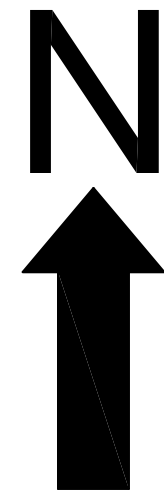
MO721 Construction Sketch, SK-01



NOTES:

- Remove all existing roof membrane and associated equipment/material for installation of new roof membrane and other associated material.
- Following the removal of the existing membrane, the contractor shall perform a visual inspection of the sheathing and ensure there is no damage prior to installing of the new membrane on the roof.
- Ensure that the existing roof structure plywood sheathing remains undamaged during the removal of the existing membrane.
- Upon roof surface fully prepared for installation of new roofing, install roof materials per manufacturer's specifications. 90-mil membrane is required to be installed. See VI-01, Sh 1.
- Roofing material is to be applied on entire roof area, approximately 3,700 square feet.
- All construction loads on the roof shall NOT exceed the roof design live load of 30psf (30 lbs/ft²). See current Good Faith Roof Assessment for recommendations.
- If more than 300 lbs concentrated point loads are to be placed on the roof, the contractor is required to install wood planks to distribute the load evenly; however, the distributed load shall NOT exceed 30psf.
- Reinstall rooftop equipment if the contractor removed equipment during the removal of the existing membrane.
- Upon complete installation of all new roof materials, contractor is required to clean the roof area from all construction debris and/or support equipment.

MO720 Construction Sketch, SK-02



NOTES:

- Remove all existing roof membrane and associated equipment/material for installation of new roof membrane and other associated material.
- Following the removal of the existing membrane, the contractor shall perform a visual inspection of the sheathing and ensure there is no damage prior to installing of the new membrane on the roof.
- Ensure that the existing roof structure plywood sheathing remains undamaged during the removal of the existing membrane.
- Upon roof surface fully prepared for installation of new roofing, install roof materials per manufacturer's specifications. 90-mil membrane is required to be installed. See VI-01, Sh 1.
- Roofing material is to be applied on entire roof area, approximately 14,800 square feet.
- All construction loads on the roof shall NOT exceed the roof design live load of 30psf (30 lbs/ft²). See current Good Faith Roof Assessment for recommendations.
- If more than 300 lbs concentrated point loads are to be placed on the roof, the contractor is required to install wood planks to distribute the load evenly; however, the distributed load shall NOT exceed 30psf.
- Reinstall rooftop equipment if the contractor removed equipment during removal of the existing membrane.
- Upon complete installation of all new roof materials, contractor is required to clean the roof area from all construction debris and/or support equipment.

Sure-White® EPDM Membranes



Overview

Sure-White is a white 60-mil (1.52 mm) or 90-mil-thick (2.28 mm) non-reinforced EPDM-based elastomeric homogenous roof covering. This roofing membrane may be used for new single-ply roof construction and re-roofing applications. Sure-White 60-mil is available in widths up to 20' (6 m) and lengths of up to 100' (30 m). Sure-White 90-mil is available in widths of 10' (3 m) and lengths of up to 100' (30 m). Sure-White EPDM membrane meets cool roof standards for initial and aged solar reflectance and thermal emittance.

Features and Benefits

- » Carlisle Sure-White EPDM has 35 years of proven performance
- » Industry leading resistance to outdoor weathering with 25,200 kJ/m² total radiant exposure without cracking or crazing
- » Factory-Applied Tape™ Seams and Pressure-Sensitive Flashing accessories enhance workmanship quality
- » White EPDM helps reduce air conditioning costs in warmer climates
 - Be advised a heating penalty may outweigh the cooling benefit in central and northern climates
- » Life Cycle Assessment using EPA's TRACI model analyzed EPDM, TPO, PVC and Modified-Bitumen
 - EPDM had the lowest Global Warming Potential
 - EPDM had the lowest Acid Rain impact
 - EPDM had the lowest contribution to Smog
- » Numerous studies and real world experience confirm that Sure-White EPDM's 540% elongation and weathering resistance result in superior hail damage resistance; UL 2218 Class 4 rating
- » EPDM is the most dimensionally stable heat resistant membrane and stays flexible even in extremely cold conditions, down to -40°F (see Flexibility/Torsion DMA data)

90-mil membrane is required to be installed.

- » Extruded manufacturing technology results in seamless 10' wide sheets
- » 60-mil and 90-mil membranes available for up to 25- and 30-year warranties and are UL and FM approved
- » Zero fungi growth in ASTM G21 test
- » Carlisle manufactures all the major components of a typical roofing system including membrane, flashings, tapes, adhesives, sealants, insulations and insulating cover boards

Carlisle's Factory-Applied Tape Seam Technology

With Carlisle's patented Factory-Applied Tape seam technology, most of the labor to create seams between membrane panels is completed in a quality-controlled, state-of-the-art environment. This process results in a reliable seam with no entrapped air bubbles. Consistent placement of the Factory-Applied Tape also maximizes the splice area resulting in a high-quality seam.

Productivity Boosting Features and Benefits:

- » With Carlisle's Factory-Applied Tape, most of the labor to create seams between membrane panels is completed in a quality-controlled, state-of-the-art environment
- » Factory-Applied Tape is available on Sure-White membranes up to 20' (6 m) in width, providing the fastest way to complete a seam in today's roofing market
- » Wider sheets like 16.5' and 20' reduce the frequency of seams compared to 10'-wide sheets



Installation

Sure-White membrane is primarily utilized in Design A, Fully Adhered Roofing Systems.

Sure-White Design A: Fully Adhered Roofing System: insulation is mechanically attached or adhered to the roof deck. The substrate and membrane are coated with Carlisle Bonding Adhesive. The membrane is then rolled into place and broomed down. To complete seams between two adjoining membrane panels, apply primer to the splice area in conjunction with Carlisle's Factory-Applied Tape. As an alternative, Carlisle's hand-applied SecurTAPE may be used.

For cold weather splicing below 40°F (5°C), these steps must be followed:

1. Heat the primed area of the bottom membrane with a hot-air gun as the top sheet with Factory-Applied Tape is applied and pressed into place.
2. Prior to rolling the splice area with a 2"-wide steel hand roller, apply heat to the top side of the membrane with a hot-air gun. The heated surface should be hot to the touch. Be careful not to burn or blister the membrane.

Review Carlisle specifications and details for complete installation information.

Sure-White EPDM Membranes

Precautions

- » Recommend using non-folded 10' or 16.5' sheets in cold weather to avoid wrinkles.
- » Sunglasses that filter out ultraviolet light are strongly recommended as the white surface intensifies sunlight through reflection.
- » White surfaces reflect heat and may become slippery due to frost and ice build-up. Exercise extreme caution during cold conditions to prevent falls.
- » Use caution when working close to a roof edge when surrounding area is snow covered as roof edge may not be clearly visible.
- » Use proper stacking procedures for sufficient stability of materials.
- » Exercise caution when walking on wet membrane. Membranes are slippery when wet.
- » Membranes with Factory-Applied Tape should not be exposed to prolonged jobsite storage temperatures in excess of 90°F (32°C); otherwise, the shelf life of the Factory-Applied Tape may be affected.
- » When Sure-White with Factory-Applied Tape is used, shade the tape end of the rolls until ready to use in warm, sunny weather.
- » Shelf life for Factory-Applied Tape is 1-year.

Radiative Properties for Cool Roof Rating Council (CRR) and LEED

Physical Property	Test Method	Sure-White EPDM
CRR – Initial solar reflectance	ASTM C1549	0.79
CRR – Solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.71
CRR – Initial thermal emittance	ASTM C1371	0.86
CRR – Initial thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.89
LEED – Thermal emittance	ASTM E408	0.91
SRI – (Solar Reflectance Index)	ASTM E1980 (initial) 3 year aged	98 87

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Carlisle, PA
Solar Reflectance Index	98
Corporate Sustainability Report	Yes

Typical Properties and Characteristics

Physical Property	Test Method	SPEC. (PASS)	Typical
Tolerance on Nominal Thickness, %	ASTM D412	±10	±10
Weight, lbs/ft ² (kg/m ²)			0.37 (1.8) 0.60 (2.9)
Tensile Strength, min, psi (MPa)	ASTM D412	1305 (9)	1465 (10.1)
Elongation, Ultimate, min, %	ASTM D412	300	540
Tear Strength, min, lbf/in (kN/m)	ASTM D624 (Die C)	150 (26.3)	187 (32.7)
Factory Seam Strength, min	Modified ASTM D816	Membrane Rupture	Membrane Rupture
Resistance to Heat Aging* Properties after 28 days @ 240°F (116°C)	ASTM D573		
Tensile Strength, min, psi (MPa)	ASTM D412	1205 (8.3)	1345 (9.3)
Elongation, Ultimate, min, %	ASTM D412	200	280
Tear Strength, min, lbf/in (kN/m)	ASTM D624	125 (21.9)	185 (32.4)
Linear Dimensional Change, max, %	ASTM D1204	±1.0	-0.2
Ozone Resistance* Condition after exposure to 100 pphm Ozone in air for 168 hours @ 104°F (40°C) Specimen is at 50% strain	ASTM D1149	No Cracks	No Cracks
Brittleness Temp., max, °F (°C)*	ASTM D746	-49 (-45)	-67 (-55)
Resistance to Water Absorption* After 7 days immersion @ 158°F (70°C) Change in mass, max, %	ASTM D471	+8, -2	+3.3
Water Vapor Permeance* Max, perms	ASTM E 96 (Proc. B or BW)	0.10	0.02
Flexibility/Torsion DMA	ASTM D5279-08	N/A	55 MPa @ -40°F
Fungi Resistance	ASTM G21	N/A	0 (No Growth)
Resistance to Outdoor (Ultraviolet) Weathering* Xenon-Arc, total radiant exposure at 0.70 W/m ² irradiance, 80°C black panel temperature	ASTM G155	No Cracks No Cracking 7,560 kJ/m ² 3,000 hrs	No Cracks No Cracking 25,200 kJ/m ² 10,000 hrs
At 0.35 W/m ² irradiance, 80°C black panel temperature		6,000 hrs	20,000 hrs
Air Permeance	ASTM E2178	(0.02 L/s*m ²)	Pass

*Not a Quality Control Test due to the time required for the test or the complexity of the test. However, all tests are run on a statistical basis to ensure overall long-term performance of the sheeting.

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

Note: Sure-White non-reinforced EPDM membrane meets or exceeds the minimum requirements set forth by ASTM D4637 for Type I non-reinforced EPDM single-ply roofing membranes.