

## ROOF REPLACEMENT

**EDWIN O. SMITH HIGH SCHOOL  
1235 STORRS ROAD  
STORRS-MANSFIELD, CT 06268  
STATE PROJECT #219-0020 RR**

S/P+A PROJECT NO. 19.006

**DATE: December 11, 2019**

The following changes to the Drawings and Project Specifications shall become a part of the Drawings and Project Specifications; superseding previously issued Drawings and Project Specifications to the extent modified by Addendum No. 2.

**General Information:**

- The deadline for RFIs was Monday, December 9, 2019.
- See attached RFIs. (12)
- See attached Substitution Requests. (5)
- DRAWING E1, PV ROOF PLAN has been added and is attached as part of this addendum. This drawing is for information and coordination purposes only as the Photovoltaic Project will be completed concurrently with the Roof Replacement.\*

**Changes to the Specifications:**

- SECTION 075216, STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMIOUS MEMBRANE ROOFING, Page 7, Article 2.7.G., revise to read as follows:

“Cover Board: ASTM C 1177, glass-mat, water-resistant gypsum substrate, ½-inch-thick.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Georgia-Pacific Corporation; **DensDeck**
    - b. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.” (*Per Internal Review*)
- SECTION 084523, FIBERGLASS-SANDWICH-PANEL ASSEMBLIES:
    - Page 5, Article 2.3.E.1.a., revise to read as follows:

“Skylight Assemblies: Minimum 0.045-inch.”
    - Page 7, Article 2.6.A., revise “2605” and “seventy percent (70%)” to read “2604” and “fifty percent (50%)”, respectively. (*Per RFI #005*)

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**Changes to the Drawings:**

- DRAWINGS C1 and A1-A4, Symbol Legend:
  - R.H., revise “J/A5-A6” to read “J/A5 & J1/A6”.
  - H.F., revise “H/A5-A6” to read “H/A5 & H1/A6”.
  - S.K., revise “P/A5” to read “P1/A5”. (*Per RFI #006*)
- DRAWING C1, CODE INFORMATION, Roof Legend:
  - Roof #11, Roof System, revise “Mod. Bit. Membrane” to read “Standing Seam Metal”.
  - Roof #19, Insulation, revise [4.5” Base Layer] to read “N/A”. (*Per RFI #006*)
- DRAWING A5, ROOF DETAILS:
  - RTU Termination Bar Detail G, revise “New mech.” to read “Exist. mech.”.
  - Skylight Detail Tag, revise tag “P” to read “P1”. (*Per RFI #006*)
- DRAWING A6, ROOF DETAILS:
  - RTU Termination Bar Detail G, revise “New mech.” to read “Exist. mech.”.
  - Metal Flue Detail Tag, revise tag “H” to read “H1”.
  - Roof Hatch Detail Tag, revise “J” to read “J1”. (*Per RFI #006*)

The bid date remains unchanged by this addendum.

The addendum consists of nineteen (19) pages of 8½” x 11” text and one (1) 30” x 42” drawing\*.

End of Addendum ‘2’

**Rebecca Bouchard**

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**From:** Rebecca Bouchard  
**Sent:** Tuesday, December 10, 2019 10:51 AM  
**To:** cheimer@silktownroofing.com  
**Subject:** RE: E.O. Smith HS - RFI

Good morning Chris.  
Please see response in red to your RFI below.  
Thank you and good luck.

*Rebecca Bouchard, CSI, CDT*  
*Specifications Writer*



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**From:** Chris Heimer <[cheimer@silktownroofing.com](mailto:cheimer@silktownroofing.com)>  
**Sent:** Friday, December 06, 2019 8:46 AM  
**To:** Ken Linsley <[klinsley@silverpetrucelli.com](mailto:klinsley@silverpetrucelli.com)>  
**Cc:** Paul Jorgensen <[pjorgensen@silverpetrucelli.com](mailto:pjorgensen@silverpetrucelli.com)>  
**Subject:** E.O. Smith HS - RFI

Hi Ken/Paul-  
For the SBS Cap sheet, what color will be used? Black or White? **-Per 075216, 2.3.B., cap sheet shall be white.**

Thanks,  
**Chris Heimer / Project Manager**  
**SilkTown Roofing, Inc.**  
27 Pleasant St., Manchester, CT 06040  
Office: (860) 647-0198 / Fax: (860) 646-0775  
Cell: (860) 883-2671



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## Rebecca Bouchard

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**From:** Rebecca Bouchard  
**Sent:** Tuesday, December 10, 2019 10:58 AM  
**To:** [estimating@ydroofing.com](mailto:estimating@ydroofing.com)  
**Cc:** [robertr@ydroofing.com](mailto:robertr@ydroofing.com)  
**Subject:** RE: Edwin O. Smith High School roof - bid RFI

Good morning Rob.  
 Please see the response in red to your RFI below.  
 Thank you and good luck.

*Rebecca Bouchard, CSI, CDT*  
*Specifications Writer*



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**From:** Estimating - YDRoofing LLC. <[estimating@ydroofing.com](mailto:estimating@ydroofing.com)>  
**Sent:** Monday, December 09, 2019 7:43 AM  
**To:** 'Ken Linsley' <[klinsley@silverpetrucelli.com](mailto:klinsley@silverpetrucelli.com)>  
**Cc:** 'ROBERT REJNIN' <[robertr@ydroofing.com](mailto:robertr@ydroofing.com)>  
**Subject:** Edwin O. Smith High School

Good Morning  
 Who are we supposed to make the Bid Bond Payable to for the Edwin O. Smith High School Project? **-Bid Bond is payable to whom your contract would be with, in this case Regional School District #19.**  
 Thanks,  
 Rob Nordman

Estimator/Assistant Project Manager  
 Young Developers, LLC  
 42 Crestway, Unit A, Hamden, CT 06514  
 Roofing Services  
 Office: 203-859-5320  
 Cell: 203-770-6814  
 Fax: 888 503 2508  
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[www.copperworkworld.com](http://www.copperworkworld.com)

## Rebecca Bouchard

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**From:** Rebecca Bouchard  
**Sent:** Tuesday, December 10, 2019 6:01 PM  
**To:** Cheri Calnan  
**Cc:** Paul Jorgensen  
**Subject:** RE: EO Smith High School Bid

Good afternoon Cheri.  
 Please see responses to your RFI in red below.  
 Thank you and good luck.

Rebecca Bouchard, CSI, CDT  
 Specifications Writer



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---

**From:** Cheri Calnan <[ccalnan@kalwall.com](mailto:ccalnan@kalwall.com)>  
**Sent:** Wednesday, November 27, 2019 9:55:12 AM  
**To:** Paul Jorgensen <[pjorgensen@silverpetrucelli.com](mailto:pjorgensen@silverpetrucelli.com)>  
**Subject:** EO Smith High School Bid

Good Morning Paul,

There are a few items in the bid documents to bring to your attention.

2.3.E.1.a. – Kalwall's interior face sheet thickness is .045" -Noted. Change will be provided in forthcoming addendum.

2.3.H.2,3,4,5,6. – Existing installation (and budget pricing) is based on the following flame and smoke criteria.

Existing Interior face sheet is **S-171 .045"** with a Flame of 50 and Smoke Developed of 250, Class B, CC-1.

In order to provide a Class A, CC-1, Flame of 20/Smoke Developed of 200, requires **S-171 Type 25 .045"** Interior face sheet

Existing Exterior face sheet **SW .070** has a Flame of 170 and Smoke Developed of 250, Class C, CC-2

In order to provide a Class A, CC-1, has a Flame spread of 15 and Smoke Developed of 450 requires **SW Type A .070** Exterior face sheet

\*Note that providing the Class A face sheets will increase the budgeted material cost. -Provide Class A as specified.

2.6.A. – Kalwall's two-coat fluoropolymer finish is AAMA 2604, not AAMA 2605. -Noted. Change will be provided in forthcoming addendum.

2.6.A.1. – Finish color was Kalwall's standard color White #00. Do you still want a custom finish color priced? -Yes.

Please provide all loads required for this building by the engineer of record for this project in PSF for Components and Cladding per Chapter 16 IBC attached.

Wind design pressures in Ultimate PSF

Roof Snow Load PSF

Roof Snow Drift Load PSF

-Loads are as indicated in Articles 2.1.B. and .G. and shall be designed as indicated in Article 2.1.A.

C1 – Do we need to meet FM Global? -No.

If yes, all my comments above are null and void, and the specification would need to be re-written per FM requirements below.

Note that the material cost will increase significantly.

Please provide specific to this project the FM Data Sheet 1-28 Chart with specific load requirements for roof panels we are to follow.

I found the attached FM Wind Data information online.

Kalwall does not accept delegated design as referenced in Chapter 16 in IBC and FM requirements.

All loads must be given in PSF by project engineer.

**FM 4471** – Approval Standard for Class 1 Panel Roofs which includes fire, structural, loading, aging and severe hail testing.

**Panel Configuration for FM 4471:**

- 2 ¼" (70mm) panel
- Exterior face sheet Type A
- Interior face sheet B-3A
- 12" x 24" (300mm x 600mm) shoji aluminum grid
- Only "U" Factors available: 0.29, 0.22 and 0.18 (1.56, 1.20, .99 W/m<sup>2</sup>K )
- Maximum panel size 5'-0" (1524mm) x 12'-0" (3658mm) with required supports at 5'-0" (1524mm) OR 5'-0" (1524mm) x 6'-0" (1829mm) with required supports at 6'-0" (1829mm)
- Windstorm rating, either 1-90 or 1-120 depending on support configuration
- Panels are marked with the FM 4471 Approval stamp.

**ALERT** - These panels must be installed in a Kalwall system and any exposed interior aluminum battens must be covered with a special intumescent coating.

Let me know how to proceed. Thank you.

Best Regards,

**Cheri Calnan** | Sales CT.RI.MA

LEED Green Associate

860.604.9781 Cell

[ccalnan@kalwall.com](mailto:ccalnan@kalwall.com)

[www.kalwall.com](http://www.kalwall.com) | [www.structuresunlimitedinc.com](http://www.structuresunlimitedinc.com)

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**S U I** - Structures Unlimited Inc.

166 River Road

Bow NH 03304 USA

## Rebecca Bouchard

---

**From:** Rebecca Bouchard  
**Sent:** Wednesday, December 11, 2019 9:44 AM  
**To:** 'cheimer@silktownroofing.com'  
**Subject:** RE: E.O. Smith High School

Good morning Chris.  
 Responses to you RFI are in red below.  
 Thank you and good luck.

*Rebecca Bouchard, CSI, CDT*  
*Specifications Writer*



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**From:** Chris Heimer <[cheimer@silktownroofing.com](mailto:cheimer@silktownroofing.com)>  
**Sent:** Thursday, December 05, 2019 5:04 PM  
**To:** Ken Linsley <[klinsley@silverpetrucelli.com](mailto:klinsley@silverpetrucelli.com)>  
**Cc:** Paul Jorgensen <[pjorgensen@silverpetrucelli.com](mailto:pjorgensen@silverpetrucelli.com)>  
**Subject:** E.O. Smith High School

Hi Ken/Paul-

A few more questions have arisen:

- Details C/A5, G/A5, C/A6 & G/A6 call out to remove existing mech unit curb/install new pre-manufactured curb or new mech unit. Please confirm no units will be getting replaced. **-Confirmed, mechanical units are existing to remain.**
- Details tag letters duplicate themselves on drawing A6 starting after letter J. (This one is more of an FYI) **-Noted. Changes will be provided in forthcoming addendum.**
- Roof legend – Roof 11 is shown as mod bit? Please confirm this should be standing seam. **-Roof 11 is standing seam.**
- Details for roof 19 U & X/A6 show no insulation or cover board under the standing seam? Will the standing seam be fastened direct to existing substrate? Roof legend calls for 4.5" base layer? Please clarify. **-No insulation is required at Roof 19. Standing seam to be fastened to existing substrate.**

Respectfully submitted,

**Chris Heimer / Project Manager**  
**Silktown Roofing, Inc.**

27 Pleasant St., Manchester, CT 06040  
 Office: (860) 647-0198 / Fax: (860) 646-0775  
 Cell: (860) 883-2671



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## Rebecca Bouchard

---

**From:** Rebecca Bouchard  
**Sent:** Wednesday, December 11, 2019 10:13 AM  
**To:** 'cheimer@silktownroofing.com'  
**Subject:** RE: E.O. Smith High School roof

Good morning Chris.  
 Response to your RFI is in red below.  
 Thank you and good luck.

*Rebecca Bouchard, CSI, CDT*  
*Specifications Writer*



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**From:** Chris Heimer <[cheimer@silktownroofing.com](mailto:cheimer@silktownroofing.com)>  
**Sent:** Friday, December 06, 2019 8:17 AM  
**To:** Ken Linsley <[klinsley@silverpetrucelli.com](mailto:klinsley@silverpetrucelli.com)>  
**Cc:** Paul Jorgensen <[pjorgensen@silverpetrucelli.com](mailto:pjorgensen@silverpetrucelli.com)>  
**Subject:** E.O. Smith High School

Hi Ken/Paul-  
 RFI-

-What is the anticipated start date and completion date for this project? Just want to make sure all bidders are clear on this. -The approximate start date would be June 22, 2020. The completion date would be September 2, 2020.

Thanks,

**Chris Heimer / Project Manager**  
**SilkTown Roofing, Inc.**

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## Rebecca Bouchard

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**From:** Rebecca Bouchard  
**Sent:** Wednesday, December 11, 2019 1:57 PM  
**To:** evazquez@titanroofing.com  
**Subject:** RE: Edwin O Smith High School Replacement

Good afternoon Edgardo.

Responses to your RFI are indicated in red below. Please note that the deadline for RFIs has now passed.

Thank you and good luck.

*Rebecca Bouchard, CSI, CDT*

*Specifications Writer*



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---

**From:** Edgardo Vazquez <evazquez@titanroofing.com>  
**Sent:** Tuesday, December 10, 2019 1:51 PM  
**To:** Rebecca Bouchard <rbouchard@silverpetrucci.com>  
**Subject:** Edwin O Smith High School Replacement

Reference Spec 075216 2.7-C: OMG Olybond 500 is listed but hot asphalt is listed under 3.4 Insulation installation. Is olybond 500 or approved equal acceptable?

-Both are required. Insulation adhesive is to be used as indicated in 3.4.J whereas hot asphalt is to be used as indicated in 3.4.K.

Reference Spec 075216: 2 ply SBS membrane – can we install a torched down system or set plies in cold adhesive in lieu of hot asphalt? -Torch or cold-applied are not acceptable.

Reference Spec 028213-6: Please confirm asbestos abatement will be covered under the “negotiated unit pricing” therefore zero cost to be included in the base bid. Should we include roof removal and disposal as a non asbestos item? -That is correct. No asbestos roofing materials were found and the transite cement board was indicated to not be touched by the project. The roof debris (if hidden behind the roofing materials tested) is a just in case and same thing with transite; these would be unit pricing. However if the Contractor drops roofing materials into the building and it's found to contain asbestos, Contractor would own all interior abatement.

Thank you.

Edgardo Vazquez  
 Titan Roofing, Inc.  
 200 Tapley Street  
 Springfield, MA 01104  
 413-536-1624

## Rebecca Bouchard

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**From:** Rebecca Bouchard  
**Sent:** Wednesday, December 11, 2019 2:05 PM  
**To:** 'The Imperial Company'  
**Subject:** RE: E O Smith, Storrs - RFI

Good afternoon Tom.  
 Responses to your RFI are in red below.  
 Thank you and good luck.

*Rebecca Bouchard, CSI, CDT*  
*Specifications Writer*



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---

**From:** Tom Rodrigue <[tomr@theimperialco.com](mailto:tomr@theimperialco.com)>  
**Sent:** Wednesday, December 04, 2019 11:08 AM  
**To:** Ken Linsley <[klinsley@silverpetrucci.com](mailto:klinsley@silverpetrucci.com)>  
**Subject:** E O Smith, Storrs - RFI

Ken,  
 Can you identify which areas of Metal Decking is exposed from the underside and requires the Insulation to be set in Low Rise Adhesive to deck? -Contractor will need to verify in field.  
 Roof Legend on page C1 lists Insulation Requirements. All Areas identified with 4.5" Base Layer only are Sloping decks and require No Tapered Insulation? -Yes, that is correct, where 4.5" base layer is indicated no tapered insulation is required.

**Thank You,**  
**TOM**



**The Imperial Company, Restoration Contractor, Inc.**

Tom Rodrigue ~ Estimator  
 261 Main Street ~ Cromwell, CT 06416  
 Office 860-632-2258 ~ Fax 860-632-2278  
[tomr@theimperialco.com](mailto:tomr@theimperialco.com)  
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**Rebecca Bouchard**

---

**From:** Rebecca Bouchard  
**Sent:** Wednesday, December 11, 2019 2:09 PM  
**To:** 'The Imperial Company'  
**Subject:** RE: E O Smith, Storrs - RFI

Good afternoon Tom.  
Response to your RFI is in red below.  
Thank you and good luck.

*Rebecca Bouchard, CSI, CDT*  
*Specifications Writer*



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---

**From:** Tom Rodrigue <[tomr@theimperialco.com](mailto:tomr@theimperialco.com)>  
**Sent:** Wednesday, December 04, 2019 2:19 PM  
**To:** Ken Linsley <[klinsley@silverpetrucci.com](mailto:klinsley@silverpetrucci.com)>  
**Subject:** FW: E O Smith, Storrs - RFI

Ken,  
FYI, Roof Area #11 on Roof Legend drawing C1, identifies Roof System as a Mod Bit Roof while you Indicate that roof area on A2 as a Standing Seam Metal Roof and Google Image identifies as a Standing Seam Metal Roof. **-Roof #11 is a standing seam metal roof.**

**Thank You,**  
**TOM**



**The Imperial Company, Restoration Contractor, Inc.**

Tom Rodrigue ~ Estimator  
261 Main Street ~ Cromwell, CT 06416  
Office 860-632-2258 ~ Fax 860-632-2278  
[tomr@theimperialco.com](mailto:tomr@theimperialco.com)  
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## Rebecca Bouchard

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**From:** Rebecca Bouchard  
**Sent:** Wednesday, December 11, 2019 2:14 PM  
**To:** 'The Imperial Company'  
**Subject:** RE: E O Smith, Storrs - RFI

Good afternoon Tom.  
 Responses to your RFI are indicated in red below.  
 Thank you and good luck.

*Rebecca Bouchard, CSI, CDT*  
*Specifications Writer*



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**From:** Tom Rodrigue <[tomr@theimperialco.com](mailto:tomr@theimperialco.com)>  
**Sent:** Wednesday, December 04, 2019 3:15 PM  
**To:** Ken Linsley <[klinsley@silverpetrucci.com](mailto:klinsley@silverpetrucci.com)>  
**Subject:** FW: E O Smith, Storrs - RFI

Ken,  
 Please indicate the Slopes of the Existing Roof Decks that will need Wood Nailers and that will require the roof plys backed nailed. -Refer to Roof Legend on Drawing C1 for roof slopes. Use manufacturer's recommendations for wood nailers for backnailing of roofing membrane.  
 Is the Pitch indicated on Roof Legend on Drawing C1 the Actual Deck Slope? Yes.

**Thank You,**  
**TOM**



**The Imperial Company, Restoration Contractor, Inc.**

Tom Rodrigue ~ Estimator  
 261 Main Street ~ Cromwell, CT 06416  
 Office 860-632-2258 ~ Fax 860-632-2278  
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**Rebecca Bouchard**

---

**From:** Rebecca Bouchard  
**Sent:** Wednesday, December 11, 2019 2:20 PM  
**To:** Dean Brown  
**Subject:** RE: Edwin O Smith High School Roof Replacement - Insulation clarification

Good afternoon Dean.  
Response to your RFI is in red below.  
Thank you and good luck.

*Rebecca Bouchard, CSI, CDT*  
*Specifications Writer*



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---

**From:** Dean Brown <Dean@congressassociates.com>  
**Sent:** Monday, November 25, 2019 1:58 PM  
**To:** Rebecca Bouchard <rbouchard@silverpetrucelli.com>  
**Subject:** Edwin O Smith High School Roof Replacement - Insulation clarification

Hi Rebecca,

I hope this email finds you well heading into the Thanksgiving Holiday !

I am wondering if you might have original roof plans for this project? I am asking because the plans I have (attached) are cut into 3 areas, and it's hard for a tapered designer to tell where the match lines are and also there are some areas that do not say if it needs taper or not. **-Please refer to the Roof Legend on Drawing C1 for what roofs require tapered insulation. Using that information and all the roof plans, the tapered design is clearly depicted.**

If you could be of any assistance that would be greatly appreciated.

Please keep me posted, and have an enjoyable Thanksgiving !

Thank you,

**Dean Brown**  
Guilford, CT | 203-533-2443  
[dean@congressassociates.com](mailto:dean@congressassociates.com)  
[www.congressassociates.com](http://www.congressassociates.com)



## Rebecca Bouchard

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**From:** Rebecca Bouchard  
**Sent:** Wednesday, December 11, 2019 2:24 PM  
**To:** Young Developers, LLC  
**Subject:** RE: Edwin O. Smith High School Roof Replacement

Good afternoon Rob.  
 Response to your RFI is in red below.  
 Thank you and good luck.

*Rebecca Bouchard, CSI, CDT*  
*Specifications Writer*



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**From:** Estimating - YDRoofing LLC. <[estimating@ydroofing.com](mailto:estimating@ydroofing.com)>  
**Sent:** Monday, December 02, 2019 11:41 AM  
**To:** Paul Jorgensen <[pjorgensen@silverpetrucelli.com](mailto:pjorgensen@silverpetrucelli.com)>  
**Subject:** Edwin O. Smith High School Roof Replacement

Good Afternoon Paul

My name is Rob Nordman with Young Developers. I am doing my take off for the Edwin O. Smith High School project, and one of my concerns in with the roof legend, it does not specify the majority of the pitched roofs correctly. This observation is based on my pictures from the walk through. Also the Square footages in the legend are based on the roofs being flat. Is there any way I can get the correct roof pitches, or correct square footages? **-We believe all the pitches and square footages indicated to be correct. Contractor to verify in field.**

Thanks,

Rob Nordman

Estimator/Assistant Project Manager

Young Developers, LLC

42 Crestway, Unit A, Hamden, CT 06514

Roofing Services

Office: 203-859-5320

Cell: 203-770-6814

Fax: 888 503 2508

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[www.copperworkworld.com](http://www.copperworkworld.com)

**Rebecca Bouchard**

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**From:** Rebecca Bouchard  
**Sent:** Wednesday, December 11, 2019 10:33 AM  
**To:** Young Developers, LLC  
**Cc:** robertr@ydroofing.com  
**Subject:** RE: Edwin O. Smith

Good morning Rob.  
Response to your substitution request is in red below.  
Thank you and good luck.

*Rebecca Bouchard, CSI, CDT*  
*Specifications Writer*



**SILVER/PETRUCELLI+ASSOCIATES**  
*Architects / Engineers / Interior Designers*

3190 Whitney Avenue Bldg 2 | Hamden, CT 06518  
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**From:** Estimating - YDRoofing LLC. <[estimating@ydroofing.com](mailto:estimating@ydroofing.com)>  
**Sent:** Tuesday, December 10, 2019 8:07 AM  
**To:** Ken Linsley <[klinsley@silverpetrucelli.com](mailto:klinsley@silverpetrucelli.com)>  
**Cc:** 'ROBERT REJNIN' <[robertr@ydroofing.com](mailto:robertr@ydroofing.com)>; Paul Jorgensen <[pjorgensen@silverpetrucelli.com](mailto:pjorgensen@silverpetrucelli.com)>  
**Subject:** Edwin O. Smith

Good Morning Ken  
For the Edwin O. Smith project we will be bidding Mulehide for the White EPDM. Please find the attached comparison sheets between Carlisle and Mulehide. Please let me know if Mulehide will be accepted for this bid. **-Mulehide is an acceptable substitution.**

Thanks,  
Rob Nordman  
Estimator/Assistant Project Manager  
Young Developers, LLC  
42 Crestway, Unit A, Hamden, CT 06514  
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# WHITE-ON- BLACK EPDM MEMBRANE SIDE BY SIDE

Firestone

Mulehide

Carlisle

Physical Properties*	Test Method	Typical Values	Typical Values	Typical Values
Tolerance on Nominal Thickness, %	ASTM D 412	+ 10	+ 10	±10
Weight, lbm/ft <sup>2</sup> (kg/m <sup>2</sup> ) 60-mil 90-mil		0.059(1.499)	0.39 (1.9) 0.60 (2.9)	0.37 (1.8) 0.60 (2.9)
Tensile Strength, min, psi (Mpa)	ASTM D 412	1360 (9.4)	1465 (10.1)	1465 (10.1)
Elongation, Ultimate, min, %	ASTM D 412	468	540	540
Tear Strength, min, lbf/in (kN/m)	ASTM D 624 (Die C)	234 (41.0)	200 (35.0)	187 (32.7)
Factory Seam Strength, min. (modified)	ASTM D 816	Sheet Failure	Membrane Rupture	Membrane Rupture
Resistance to Heat Aging** Properties after 1 weeks @ 240°F(116°C) Tensile Strength, min, psi (MPa) Elongation, Ultimate, min, % Tear Resistance, min,lbf/in (kN/m) Linear Dimensional Change, max, %	ASTM D 573	1317 (9.1) 325 240 (42.0) -0.5	1345 (9.3) 280 185 (32.4) -0.2	1345 (9.3) 280 185 (32.4) -0.2
Ozone Resistance** Conditions after exposure to 100 pphm Ozone in air for 168 hrs @ 104°F (40°C) Specimen is at 50% strain	ASTM D 1149	Pass	No Cracks	No Cracks
Brittleness Temp., max, deg. F (deg.C)**	ASTM D 746	-69 (-56)	-67 (-55)	-67 (-55)
Resistance to Water Absorption** After 7 days immersion @ 158°F (70°C), Change in mass, max, %	ASTM D 471	+2.5	+3.3	+3.3
Water Vapor Permeability** max, perm-mils	ASTM E 96 (Proc. B or BW)	N/A	0.02	0.02
Resistance to Outdoor (Ultraviolet) Weathering* Xenon-Arc, total radiant exposure at 0.70 W/m <sup>2</sup> Irradiance,176°F (80°C) black panel temperature	ASTM D 4637 Conditions	N/A	No Cracks No Cracking 25,200 kJ/m <sup>2</sup>	No Cracks No Cracking 25,200 kJ/m <sup>2</sup>
Fungi Resistance	ASTM G21	N/A	0 (no growth)	0 (No Growth)

\*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 or specification range for any particular property of this product.

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

RADIATIVE PROPERTIES for ENERGY STAR*, CRRC and LEED			Mulehide	Carlisle	Firestone
DESCRIPTION	TEST METHOD	WHITE EPDM	WHITE EPDM	WHITE EPDM	WHITE EPDM
ENERGY STAR® initial solar reflectance	Solar Spectrum Reflectometer	0.76	0.76	0.80	
ENERGY STAR® Solar Reflectance after 3 years	Solar Spectrum Reflectometer	0.64	0.64	0.72	
CRRC initial solar reflectance	ASTM C1549	0.76	0.76	0.83	
CRRC solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.64	0.64	N/A	
CRRC initial thermal emittance	ASTM C1371	0.90	0.90	0.92	
CRRC thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.87	0.87	N/A	
CRRC SRI (Solar Reflectance Index)	ASTM E1980	94	94	105	
LEED™ thermal emittance	ASTM E408	0.94	0.94	N/A	





# Product Data Sheet

## MULE-HIDE WHITE-ON- BLACK EPDM MEMBRANE (60-MIL AND 90MIL)

### PRODUCT DESCRIPTION

Mule-Hide White-on-Black EPDM membranes (60-mil and 90-mil) are high performance non-reinforced products that stand up to tearing, impacts, punctures and normal roof traffic. The elastomeric properties of the EPDM sheet compensates for thermal shock and building movement. EPDM membranes provide excellent resistance to ozone and aging. These membranes are manufactured in accordance with the guidelines established by the RMA (Rubber Manufacturers Association) and meet or exceed ASTM Standard Specification D 4637, Type I. Mule-Hide White-on-Black EPDM membrane is available with pre-applied in-seam tape. See Packaging section below for available sizes.



### BASIC USES

Our White-on-Black 60-mil and 90-mil EPDM membranes are used primarily in fully adhered roofing systems on new construction, reroofing and recover (retrofit) applications. The 60-mil membrane may also be used as flexible membrane flashings for walls, curbs, etc, when installing an EPDM membrane roofing systems. The system must be installed over acceptable roof insulation or other suitable substrate. See our Mule-Hide Specifications Manual for complete specifications and details.

### SPECIFICATIONS

Physical Properties*	Test Method	SPEC (Pass)	Typical Values
Tolerance on Nominal Thickness, %	ASTM D 412	± 10	± 10
Weight, lbf/ft <sup>2</sup> (kg/m <sup>2</sup> )			
60-mil			0.39 (1.9)
90-mil			0.60 (2.9)
Tensile Strength, min, psi (Mpa)	ASTM D 412	1305 (9)	1465 (10.1)
Elongation, Ultimate, min, %	ASTM D 412	300	540
Tear Strength, min, lbf/in (kN/m)	ASTM D 624 (Die C)	150 (26.3)	200 (35.0)
Factory Seam Strength, min. (modified)	ASTM D 816	Membrane Rupture	Membrane Rupture
Resistance to Heat Aging**	ASTM D 573		
Properties after 1 weeks @ 240°F(116°C)			
Tensile Strength, min, psi (MPa)	ASTM D 412	1205 (8.3)	1345 (9.3)
Elongation, Ultimate, min, %	ASTM D 412	200	280
Tear Resistance, min,lbf/in (kN/m)	ASTM D 624	125 (21.9)	185 (32.4)
Linear Dimensional Change, max, %	ASTM D 1204	± 1.0	-0.2
Ozone Resistance**			
Conditions after exposure to 100 pphm Ozone in air for 168 hrs @ 104°F (40°C) Specimen is at 50% strain	ASTM D 1149	No Cracks	No Cracks
Brittleness Temp., max, deg. F (deg.C)**	ASTM D 746	-49 (-45)	-67 (-55)
Resistance to Water Absorption**			
After 7 days immersion @ 158°F (70°C), Change in mass, max, %	ASTM D 471	+8, -2	+3.3
Water Vapor Permeability**			
max, perm-mils	ASTM E 96 (Proc. B or BW)	0.10	0.02
Resistance to Outdoor (Ultraviolet) Weathering*			
Xenon-Arc, total radiant exposure at 0.70 W/m <sup>2</sup> Irradiance,176°F (80°C) black panel temperature	ASTM G155	No Cracks No Cracking 6560 kJ/m <sup>2</sup> 3,000 hrs	No Cracks No Cracking 25,200 kJ/m <sup>2</sup> 20,000 hrs
Fungi Resistance	ASTM G21	N/A	0 (no growth)
*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 or specification range for any particular property of this product.			
**Not a Quality Control Test due to the time required for the test or the complexity of the test. However, all tests run on a statistical basis to ensure overall long-term performance of the sheeting.			

# Product Data Sheet

MULE-HIDE WHITE-ON-BLACK EPDM MEMBRANE (60-MIL AND 90-MIL)

LEED Information	
Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Carlisle, PA
Solar Reflectance Index (SRI)	94

## **PACKAGING**

Roll sizes for Mule-Hide **60-mil** White-on-Black EPDM are 10' x 50', 10' x 100', 16.5' x 100', 20' x 50' and 20' x 100'.  
Roll sizes for Mule-Hide **90-mil** White-on-Black EPDM are 10' x 50' and 10' x 100'

Roll sizes for pre-taped White-on-Black EPDM membranes are as follows:

Product	Packaging	Roll Size	Tape Width
.060 White-on-Black, Pre-Taped	2 - Pack	10' x 100'	3"
.060 White-on-Black, Pre-Taped, <b>Wide Roll</b>	1 - Pack	20' x 100'	3"
.090 White-on-Black, Pre-Taped	2 - Pack	10' x 100'	6"

## **BENEFITS & SUPPLEMENTAL STATEMENTS**

- Can be installed over a variety of roof decks
- Outstanding weatherability
- Sheets can be pre-taped for labor savings and consistent seam placement
- Requires no special equipment to install
- Available as a lightweight system
- Full line of pre-taped accessories available

## **CODE APPROVALS/COMPLIANCE**

A variety of Factory Mutual Ratings, Underwriters Laboratories Classifications and Miami-Dade Approvals are available. Contact Mule-Hide Warranty Department for additional information. Meets or exceeds requirements of ASTM D 4637, Type I for non-reinforced EPDM single-ply roofing membranes.

## **INSTALLATION INSTRUCTIONS**

- 1) Approved insulation shall be attached to the roof deck with an approved insulation adhesive or approved fasteners and plates. Install insulation with its largest dimension perpendicular to the direction of the membrane seams where possible.
- 2) Fully Adhered Roofing System
  - a) The membrane is required to be mechanically attached at the base of all vertical surfaces, roof edges, and angle changes.
  - b) The field of the roof is fully adhered to the substrate with Mule-Hide membrane adhesive.
- 4) Field seams are made with seam tape and tape primer. Pre-taped seams are available for faster installation.
- 5) All details will be done in accordance with Mule-Hide details.
- 6) On projects where a Mule-Hide Standard or Premium Warranty is requested, an authorized Mule-Hide representative shall inspect all completed work. This is only a brief summary and not the complete specification. The Mule-Hide Specifications, Details, Technical Bulletins, and associated documents should be thoroughly reviewed prior to starting any project. Contact Mule-Hide Products for additional information.

## **PRECAUTIONS**

- Surfaces may be slippery when wet, or due to frost and ice build-up. Exercise caution to prevent falls.
- Mule-Hide White-on-Black EPDM membranes are highly reflective to sunlight. Workers should dress appropriately, wear sunscreen, and wear sunglasses that filter out UV light.
- Exercise care when working near roof edge. Roof edges may not be visible when surrounding area is covered with snow.
- Store Mule-Hide membrane in original wrappings in a cool, shaded area. Cover with light-colored, breathable, waterproof tarpaulins

# Product Data Sheet

MULE-HIDE WHITE-ON-BLACK EPDM MEMBRANE (60-MIL AND 90-MIL)

## **STORAGE & HANDLING**

- Use proper stacking procedures to ensure sufficient stability of the materials.
- Surfaces may be slippery when wet, or due to frost and ice build-up. Exercise caution to prevent falls.
- Exercise care when working near edge of roof.
- Store Mule-Hide membrane in original wrappings in a cool, shaded area. Cover with light colored, breathable, waterproof tarpaulins.
- Pre-Taped membranes should not be exposed to prolonged jobsite storage temperatures in excess of 90°F (32°C), otherwise the shelf life of the Pre-Tape may be affected.
- When using pre-taped membranes in warm, sunny weather, shade the tape end of the rolls until ready to use.
- Mule-Hide Pre-Tape has a shelf life of one year.

## **PROTECTION & SAFETY**

Mule-Hide maintains Safety Data Sheets on all of its non-exempt products. Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

## **SUPPLEMENTAL APPROVALS, STATEMENTS AND CHARACTERISTICS**

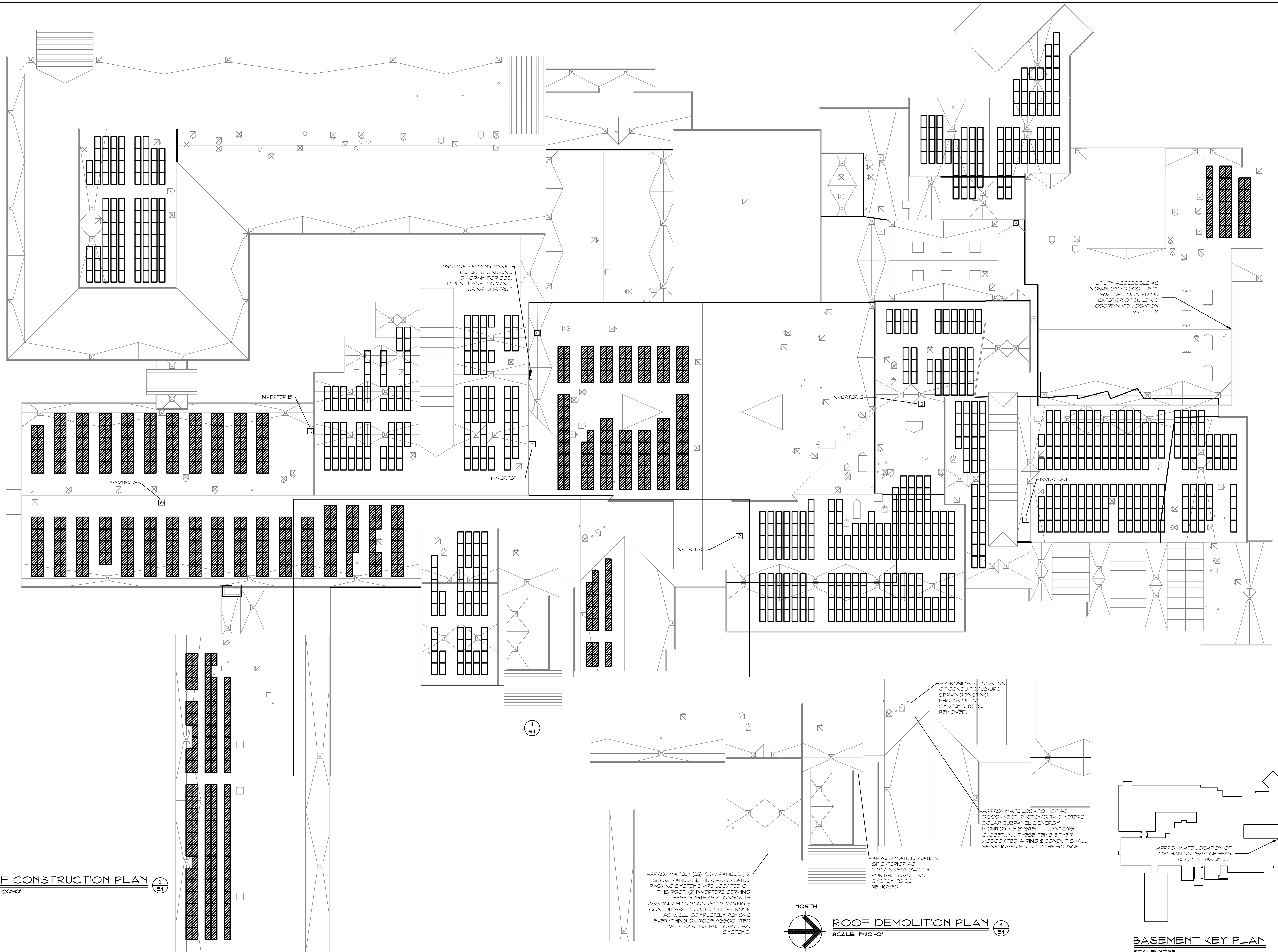
<b>RADIATIVE PROPERTIES for ENERGY STAR®, CRRC and LEED</b>		
<b>DESCRIPTION</b>	<b>TEST METHOD</b>	<b>WHITE EPDM</b>
<b>ENERGY STAR®</b> initial solar reflectance	Solar Spectrum Reflectometer	0.76
<b>ENERGY STAR®</b> Solar Reflectance after 3 years	Solar Spectrum Reflectometer	0.64
<b>CRRC</b> initial solar reflectance	ASTM C1549	0.76
<b>CRRC</b> solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.64
<b>CRRC</b> initial thermal emittance	ASTM C1371	0.90
<b>CRRC</b> thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.87
<b>CRRC</b> SRI (Solar Reflectance Index)	ASTM E1980	94
<b>LEED™</b> thermal emittance	ASTM E408	0.94

## **ADDITIONAL INFORMATION**

The information given on this PDS is subject to change without notice. Always check the Mule-Hide website at [www.mulehide.com](http://www.mulehide.com) for the latest information, changes and updates or contact Mule-Hide Products Company at 800-786-1492.

## **DISCLAIMER**

The statements provided concerning the material shown are intended as a guide for material usage and are believed to be true and accurate at the time of printing. No statement made by anyone may supersede this information, except when done in writing by Mule-Hide Products Co., Inc. Since the manner of use is beyond our control, Mule-Hide does not authorize anyone to make any warranty of merchantability or fitness for any particular purpose or any other warranty, guarantee or representation, expressed or implied, concerning this material. This product may be eligible for a Mule-Hide warranty, please check the Mule-Hide website at [www.mulehide.com](http://www.mulehide.com) or contact Mule-Hide directly at 800-786-1492 for details. Buyer and user accept the product under these conditions and assume the risk of any failure, any injury person or property (including that of the user), loss or liability resulting from the handling, storage or use of the product whether or not it is handled, stored or used in accordance with the directions or specifications. Mule-Hide must be notified in writing of any claims and be given the opportunity to inspect the alleged failure before repairs are made.



**ROOF CONSTRUCTION PLAN**  
SCALE: 1/4"=20'-0"  
2 E1

**ROOF DEMOLITION PLAN**  
SCALE: 1/4"=20'-0"  
1 E1

**BASEMENT KEY PLAN**  
SCALE: NONE



Revision	Description	Date	Revised By: