TEXAS
Health and Human Services

Attachment H1

Project Specifications

PROJECT MANUAL

RIO GRANDE STATE CENTER ROOF REPLACEMENT AT BUILDING 511

PROJECT #: 20-122-RSC

RIO GRANDE STATE CENTER
1401 SOUTH RANGERVILLE ROAD, HARLINGEN, TX 78552

Publication Date:

Dec 11, 2020

4444 Corona Dr., Suite 207
Corpus Christi, Texas 78411

Phone: (361) 299-0000

Austin ▪ Dallas ▪ Denver ▪ Houston ▪ Rio Grande Valley ▪ Corpus Christi

SET NO. _____

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PRE CONSTRUCTION DOCUMENT LIST

E702 – SUBMITTAL ROUTING SHEET
E703 – MONTHLY CONSTRUCTION PAYMENT AFFIDAVIT
E704: CONTRACTOR'S AFFIDAVIT OF BILLS PAID
E705: MONTHLY PAY APPLICATION REQUIREMENTS
E712: SCHEDULE OF VALUES
E720: CHANGE ORDER FORM
E803: FINAL PAY & CLOSE OUT CHECKLIST
CPA – HSP PROGRESS ASSESSMENT REPORT
AP-152: APPLICATION FOR TEXAS IDENTIFICATION NUMBER
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01-339: TEXAS SALES AND USE TAX RESALE CERTIFICATE

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TEXAS Health and Human Services

MAINTENANCE AND CONSTRUCTION SECTION
TEXAS HEALTH AND HUMAN SERVICES COMMISSION
P. O. Box 12668, Austin, Texas 78711-2668 (512) 206-5880

SUBMITTAL

Project No. _____ Project Title _____

No. of Copies _____ Description of Submittal _____ Date _____

Contractor _____ Address _____ Zip Code _____

Architect/Engineer _____ Address _____ Zip Code _____

Note: Approval does not relieve contractor from responsibility for errors on submittal and for deviations from drawings and specifications unless he notifies A/E in writing and receives written approval. Drawing and specification changes are NOT authorized by approval of submittal.

SUBMITTAL NO. _____

ROUTING AND ACTION

CONTRACTOR

- ☐ Submittal checked for compliance (stamped, signed and dated)
- ☐ Submittal sent to Architect/Engineer

By _____ Date _____

ARCHITECT/ENGINEER

- ☐ Reviewed, no exceptions taken (stamped, signed and dated)
- ☐ Reviewed, exceptions as noted (stamped, signed and dated)
- ☐ Revise and resubmit
- ☐ Rejected, resubmit
- ☐ Submittal sent to M&C Project Manager

By _____ Date _____

FACILITY REVIEW

- ☐ Submittal reviewed by Facility – Plant Engineer

By _____ Date _____

MAINTENANCE AND CONSTRUCTION

- ☐ Submittal reviewed by M&C Project Manager

_____ NO. of copies received by Maintenance and Construction

Reviewed By _____ Date _____

Distribution as noted below:

_____ Contractor
_____ Architect/Engineer
_____ Facility – Plant Engineer
_____ M&C – Project Manager
_____ Maintenance and Construction File

Date _____

REMARKS

By _____ Date _____

MONTHLY CONSTRUCTION PAYMENT AFFIDAVIT*

State of Texas
County of _____

The undersigned, being duly sworn and having personal knowledge of the matters set forth herein, deposes and says under oath:

1. That I, _____, am _____
(Name) (Title)

of _____
(Firm/Corporation/Partnership, etc.)

2. That _____ is the Contractor of a
(Firm/Corporation/Partnership, etc.)

construction project pursuant to a Contract, identified as:

Project Number: _____

Project Name: _____

Facility Name: _____

("Contract" herein) in which the State of Texas is defined as the Owner.

3. The Contractor has performed work and labor or furnished materials for use in the construction project defined by the Contract.

4. All payments by the Contractor to its subcontractors and material suppliers for work, labor, machinery and equipment furnished to it by said subcontractors and material suppliers are timely made or shall be made within the meaning of and in accordance with the requirements of the Uniform General Conditions and Supplementary General Conditions applicable to the Contract and Contractor knows of no other person or entity having a right to assert any lien on account of material or labor furnished to it for construction pursuant to the Contract.

Signature _____

Title _____

Sworn and subscribed to before me the undersigned authority on
this _____ day of _____, 20___.

_____
Notary Public State of Texas

My Commission Expires _____

*Submit this form with monthly Construction Voucher. Submit form entitled "Contractor's Affidavit of Bills Paid" with final Construction Voucher.

CONTRACTOR'S AFFIDAVIT OF BILLS PAID

STATE OF TEXAS
COUNTY OF _____

Personally, before me the undersigned authority, on this date appeared _____, who being duly sworn, on oath, says that he is a duly authorized representative of _____ and that all terms of the contract for the construction of
(Full name of contractor as in contract)

_____

have been satisfactorily completed and that all sums of money due for labor, materials, and equipment furnished for the purpose of such improvements provided for in the contract, to the best of my knowledge and belief, have been paid, except such unpaid sums for which claims have been filed under provisions of laws.

_____
Signature

_____
Title

Sworn to and subscribed before me this _____ day of _____, 20___.

(Seal)

_____
Notary Public in and for _____County, Texas

INSTRUCTIONS:

If the Contractor is an individual, he shall sign the affidavit. If the Contractor is a partnership, any partner may sign it. If the Contractor is a corporation, a person authorized by the by-laws or by the Board of Directors shall sign it. If the Contractor is a joint-venture of individuals, any of the individuals may sign it. If the Contractor is a joint-venture of partnerships or of individuals and partnerships, the affidavit may be signed by the individual or any partner of any partnership. If the Contractor is a joint-venture in which a corporation is a party, separate affidavits must be executed in the name of the joint-venture; one by each corporation and one by each individual or partnership. Signatures for corporations should be by a duly authorized officer. If signature is by another, a showing of authority to sign must accompany the affidavit.

CONTRACTOR'S AFFIDAVIT OF BILLS PAID

STATE OF TEXAS
COUNTY OF _____

Personally, before me the undersigned authority, on this date appeared _____, who being duly sworn, on oath, says that he is a duly authorized representative of _____ and that all terms of the contract for the construction of
(Full name of contractor as in contract)

_____

_____

have been satisfactorily completed and that all sums of money due for labor, materials, and equipment furnished for the purpose of such improvements provided for in the contract, to the best of my knowledge and belief, have been paid, except such unpaid sums for which claims have been filed under provisions of laws.

_____
Signature

_____
Title

Sworn to and subscribed before me this _____ day of _____, 20___.

(Seal)

_____
Notary Public in and for _____County, Texas

INSTRUCTIONS:

If the Contractor is an individual, he shall sign the affidavit. If the Contractor is a partnership, any partner may sign it. If the Contractor is a corporation, a person authorized by the by-laws or by the Board of Directors shall sign it. If the Contractor is a joint-venture of individuals, any of the individuals may sign it. If the Contractor is a joint-venture of partnerships or of individuals and partnerships, the affidavit may be signed by the individual or any partner of any partnership. If the Contractor is a joint-venture in which a corporation is a party, separate affidavits must be executed in the name of the joint-venture; one by each corporation and one by each individual or partnership. Signatures for corporations should be by a duly authorized officer. If signature is by another, a showing of authority to sign must accompany the affidavit.

The Following Information is Required for the Monthly Pay PayApp Meeting

1. Provide monthly construction PayApp – Three (3) Copies. The contractor is to provide a schedule of values, showing each element of work broken out and a labor and materials price attached for each element. **The Schedule of Values must be given to the A/E and the HHSC Project Manager and approved by both before a PayApp meeting can be held or a PayApp can be approved or paid.**
2. A current detailed cost breakdown sheet (schedule of values). Must be attached to each PayApp.
3. The Contractors Monthly Affidavit of Bills Paid form must be attached to the PayApp
4. Submit the appropriate Prime Contractor Progress Assessment Report form each month with the Construction PayApp.
   - Total Contract Amount Paid this Period to Contractor - this should be the amount being paid to the contractor for this PayApp (i.e. the amount of the check). Some contractors are not putting a number, or putting "0".
   - Subcontractor/Supplier Name(s) - this should list all subcontractors and suppliers that the prime contractor has a direct contract with, even if they are not HUBs (i.e. every subcontractor and supplier listed in the HUB Plan submitted with the bid). If there was no subcontracting opportunity, then it should state "None".
   - Total Contract $ Amount from Section 8 of approved HSP - this should be the total amount of the subcontractor's or supplier's contract.
   - Total Reported - the totals for the money columns should be filled in.
   - Signatures, Title & Date - the contractor must sign, date, and list his/her title.
5. An updated project schedule showing the breakout of each element of work and the length of time for each element. **The schedule is to be submitted to the A/E and HHSC Project Manager for approval before the first pay PayApp meeting or before a PayApp can be approved or paid.** The schedule is to be reviewed at each PayApp meeting to determine status of the project between meetings.
6. The Contractor is to bring to each PayApp meeting the following items:
   a. RFI Log – Listing RFI's and the status of each
   b. Submittal log – Listing Submittals and the status of each.
   c. Change Request Log – Listing the CR's and the status of each.

SCHEDULE OF VALUES

PROJECT NO. **ESTIMATE NO.**

Item	Type of Work	Contract Amount	Previously Earned	Amount Earned This Voucher	Total Earned	%
1					$0.00	
2					$0.00	
3					$0.00	
4					$0.00	
5					$0.00	
6					$0.00	
7					$0.00	
8					$0.00	
9					$0.00	
10					$0.00	
11					$0.00	
12					$0.00	
13					$0.00	
14					$0.00	
15					$0.00	
16					$0.00	
17					$0.00	
18					$0.00	
19					$0.00	
20					$0.00	
21					$0.00	
22					$0.00	
23					$0.00	
24					$0.00	
25					$0.00	
26					$0.00	
27					$0.00	
	TOTALS	$0.00	$0.00	$0.00	$0.00	

CERTIFICATE OF THE OWNER'S DESIGNATED REPRESENTATIVE

I certify that I have verified the contents of this Schedule of Values and the attached Construction Voucher. Therefore, to the best of my knowledge and belief, the following statements regarding these documents are true and correct: (1) The Schedule of Values is an accurate representation of the work performed and materials supplied by the Contractor. (2) All such work and material included in this Estimate have been performed in accordance with the terms of the corresponding Construction Contract Documents and authorized changes thereto as detailed above. (3) The Contractor's representations on the Construction Voucher are an accurate representation of the Contractor's account including the amount currently due.

Date

Owner's Designated Representative

TEXAS Health and Human Services

Maintenance & Construction

A - Proposed Change Order

Change Order Routing (See UGC/SGC Article 11, Changes, for detailed instructions):

Note: Enter information only in shaded boxes.

Project No.
PCO No.

1. Architect/Engineer prepares Proposed Change Order Part A - Change Description. A/E describes changes, including references to any attachments. A/E signs and seals then transmits completed form and attachments to contractor.

2. Contractor prepares PCO Part B - Change Proposal. Contractor attaches supporting vendor quotes and subcontractor proposals, then transmits completed form to A/E.

3. A/E evaluates Part B information and prepares Part C - Recommendation. A/E enters appropriate comments, renders an opinion on cost and time changes, signs and transmit the PCO form to the ODR.

4. ODR and PMM review Part D - Owner's Change Authorization and sign if approved.

5. ODR submits Proposed Change Order package to Maintenance & Construction Contract Manager for M&C review and approval. Procurement and Contracting Services reviews, obtains authorizing signature and distributes Change Order and Purchase Order.

To: Contractor

Please prepare Part B - Change Proposal for the following proposed change (additional sealed documents necessary to completely describe the change identified below are attached):

Item	Description
1	
2	
3	
4	
5	

Architect/Engineer Signature

Date

Typed or Printed Name

SEAL

TEXAS Health and Human Services

Final Payment and Closeout Checklist

M&C Project No.:	Project Name:
	Location:

Prior to final payment the following must be completed and signed by the Contractor, A/E and PM

1 **Contractor Obligations to HHSC**

- ☐ Original Certificate of Substantial Completion transmitted to A/E (signed).
- ☐ Letter of Guarantee, Warranties transmitted to A/E (As noted in specifications).
- ☐ Final copy of Closeout Documents and List of Project Submittals transmitted to A/E
- ☐ As Built Information, plans and specifications, transmitted to A/E for A/E use
- ☐ O&M manuals transmitted to A/E – 3 sets
- ☐ All punch list items are completed (verified by PM, A/E & Facility)
- ☐ Consent of Surety to Final Payment and power of attorney (provided by the surety) transmitted to A/E
- ☐ Provide final construction voucher transmitted to A/E – Three (3) Copies
- ☐ The Contractors Affidavit of Bills Paid form transmitted to A/E (Include with Final Voucher)
- ☐ Final HUB form transmitted to A/E (Include with final voucher)
- ☐ Notarized Certification that all *"materials and equipment used in fulfillment of this contract responsibilities are non-asbestos containing building materials"*. See UGC 13.7
- ☐ *Staff Training by Contractor signed off & verified by Facility* - **(when required)**

Contractor certifies that the items indicated above have been completed and sent to A/E _____ By Contractor _____ Date

2 **Architect/Engineers**

- ☐ Substantial Completion Inspection and Final Punch list completed and transmitted to M&C (signed)
  All Contract Change Orders processed that effect final payment
- ☐ Final Copy of Closeout Documents and list of Project Submittals sent to M&C
- ☐ A/E certification and recommendation to Owner for payment of Contractor's final payment transmitted to M&C
- ☐ A/E review of items transmitted to A/E by Contractor, verified and sent to M&C from 1 above

Architect/Engineer certifies that all items indicated above (including Contractor items) have been completed sent to M&C _____ By A/E _____ Date

3 **Architect/Engineers Obligations to M&C: (To expedite, the A/E can copy this sheet and send the Contractor's documents and the Contractor's signed portion of this checklist to M&C and send the A/E's checklist in a separate transmittal.)**

- ☐ One (1) set, reproducible as-built drawings (film Mylar), transmitted to M&C
- ☐ Two (2) copies specification project manuals, transmitted to M&C
- ☐ Two (2) sets of CAD elect data disks, CD-ROMs, transmitted to M&C
- ☐ Two (2) set of prints, transmitted to M&C
- ☐ One (1) Copy of the A/E final payment, voucher transmitted to M&C
- ☐ Certification of non-asbestos for products
- ☐ *Copies of final A/E's HUB PAR form, transmitted to M&C* – ***(If Applicable)***

Architect/Engineer certifies that all items indicated above have been completed and items sent to M&C _____ By A/E _____ Date

HUB Subcontracting Plan (HSP)

Prime Contractor Progress Assessment Report

Rev. 10/16

This form must be completed and submitted to the contracting agency each month to document compliance with your HSP.

Contract/Requisition Number: _____ Date of Award: _____ Object Code: _____

Contracting Agency/University Name: _____

Contractor (Company) Name: _____ State of Texas VID #: _____

Point of Contact: _____ Phone #: _____

Reporting (Month) Period: _____ Total Amount Paid this Reporting Period to Contractor: $ -

Report HUB and Non-HUB subcontractor information

When verifying subcontractors' HUB status, ensure that you use the State of Texas' Centralized Master Bidders List (CMBL) - Historically Underutilized (HUB) Directory Search located at: http://mycpa.cpa.state.tx.us/tpasscmblsearch/index.jsp. HUB status code "A" signifies that the company is a Texas certified HUB.

Subcontractor's Name	Texas certified HUB (Yes or No)	Texas VID or federal EIN Do not enter Social Security Numbers. If you do not know their VID / EIN, leave their VID / EIN field blank.	Total Contract $ Amount from HSP with Subcontractor	Total $ Amount Paid this Reporting Period to Subcontractor	Total Contract $ Amount Paid to Date to Subcontractor	Object Code (Agency Use Only)
			$ -	$ -	$ -	
			$ -	$ -	$ -	
			$ -	$ -	$ -	
			$ -	$ -	$ -	
			$ -	$ -	$ -	
			$ -	$ -	$ -	
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			$ -	$ -	$ -	
			$ -	$ -	$ -	
			$ -	$ -	$ -	
		TOTALS:	$ -	$ -	$ -	

Signature: _____ **Title:** _____ **Date:** _____

PRINT FORM | CLEAR FORM

Comptroller of Public Accounts FORM AP-152 (Rev.4-11/14)

Application for Texas Identification Number

• *See instructions on back*

For Comptroller's use only

1. Is this a new account? ☐ YES Mail Code 000 Complete Sections 1 - 5 ☐ NO Enter Mail Code ____ Complete Sections 1, 2 & 5 Agency number ____

Section 1

2. **Texas Identification Number (TIN) -** Indicate the type of number you are providing to be used for your TIN
   - ☐ **1** - Employer Identification Number (EIN)
   - ☐ **2** - Social Security number (SSN) Enter the number indicated ____
   - ☐ **3** - Comptroller's assigned number (FOR STATE AGENCY USE ONLY)
3. Are you currently reporting any Texas tax to the Comptroller's office such as sales tax or franchise tax?
   ☐ YES ☐ NO If "YES," enter Texas Taxpayer Number ____

Section 2

Payee Information *(Please type or print)*

4. Name of payee (Individual or business to be paid) ____
5. Mailing address where you want to receive payments ____
6. *(Optional)* ____
7. *(Optional)* ____
8. *(Optional)* ____
9. City ____ State ____ ZIP Code ____ – ____
10. Payee telephone number *(Area code and number)* (____) ____ – ____ | SIC code ____ | Security type code ____ (**0, 1, 2**) | Zone code ____

Section 3

11. **Ownership Codes -** Check only one code by the appropriate ownership type that applies to you or your business.

☐ **I** - Individual Recipient (not owning a business)

☐ **S** - Sole Ownership (Individual owning a business): If checked, enter the owner's name and Social Security number (SSN)

Owner's name ____

SSN 2 ____

☐ **P** - Partnership: If checked, enter two partner's names and Social Security numbers (SSN). If a partner is a corporation, use the corporation's Employer Identification Number (EIN).

Name ____

SSN/EIN ____

Name ____

SSN/EIN ____

☐ **L** - Texas Limited Partnership: If checked, enter the Texas File Number ____

☐ **T** - Texas Corporation: If checked, enter the Texas File Number ____

☐ **A** - Professional Association: If checked, enter the Texas File Number ____

☐ **C** - Professional Corporation: If checked, enter the Texas File Number ____

☐ **O** - Out-of-State Corporation

☐ **G** - Governmental Entity

☐ **U** - State agency / University

☐ **F** - Financial Institution

☐ **R** - Foreign (out of U.S.A.)

☐ **N** - Other: If checked, explain. ____

Section 4

12. Payment Assignment? ☐ YES ☐ NO *Note: A copy of the assignment agreement between payees must be attached.*

Assignee name ____

Assignee TIN ____ Assignment date ____

Section 5

13. Comments ____

14. **sign here** Authorized signature *(Applicant or authorized agent)* ____ Date ____

15. Agency name ____ Prepared by ____ Phone *(Area code and number)* ____

S U S A N

C O M B S

Application for Texas Identification Number

TEXAS COMPTROLLER *of* PUBLIC ACCOUNTS

Fiscal Management
Austin, TX 78774-0100

Who Must Submit This Application -

This application must be submitted by every person (sole owner, individual recipient, partnership, corporation or other organization) who intends to bill agencies of the state government for goods, services provided, refunds, public assistance, etc. The Texas Identification Number (TIN) will be required on all maintenance submitted by state agencies. The use of this number on all billings will reduce the time required to process billings to the State of Texas.

Note: To expedite processing of this application, please return the completed application to the state agency with which you are conducting business. It is not necessary for the payee to sign or complete this form. The state agency representative may complete the form for the payee.

For Assistance -

For assistance in completing this application, please call the Texas Comptroller's office at (800) 531-5441, ext. 6-8138. The Austin number is (512) 936-8138.

Notice to State Agencies -

When this form is used to set up additional mail codes, Sections 1, 2 and 5 must be completed. State agencies may refer to the Texas Identification Number System (TINS) Guide at https://fmx.cpa.state.tx.us/fmx/pubs/tins/tinsguide for additional information.

General Instructions -

- Do not use dashes when entering Social Security, Employer Identification or Comptroller's assigned numbers.
- Disclosure of your Social Security number is required. This disclosure requirement has been adopted under the Federal Privacy Act of 1974 (5 U.S.C.A. sec. 552a(note)(West 1977), the Tax Reform Act of 1976 (42 U.S.C.A. sec. 405(c)(2)(C) (West 1992), TEX. GOV'T. CODE ANN. sec. 403.055 (Vernon 2005) and TEX. GOV'T. CODE ANN. sec. 403.056 (Vernon 2005). Your Social Security number will be used to help the Texas Comptroller of Public Accounts administer the state's tax laws and for other purposes. See Op Tex. Att'y Gen. No. H-1255 (1978).

Specific Instructions -

Section 1 - Texas Identification Number

EIN: For all ownership codes other than Individual Recipient listed in Section 3, enter a 9-digit Employer Identification Number (EIN) issued by the Internal Revenue Service.

SSN: For Individual Recipient or Sole Owner without an EIN, enter your 9-digit Social Security number (SSN) issued by the Social Security Administration.

Comptroller Assigned Number: FOR STATE AGENCY USE ONLY. A Comptroller Assigned Number is an ID number that is given to a state agency that needs to pay either a foreign entity or a foreign individual who does not have an EIN or SSN.

Are you currently reporting any Texas tax to the Comptroller's office such as sales tax or franchise tax? If "YES," enter Texas Taxpayer Number.

Section 2 - Payee Information

Items 4 through 8 - Enter the complete name and mailing address where you want payments to be received. Names of individuals must be entered first name first. Each line cannot exceed 50 characters including spaces. If the name is more than 50 characters, continue the name in Item 5 and begin the address in Item 6.

Item 9 - Enter the city, state and ZIP Code.

Item 10 - Enter payee telephone number.

SIC code, Security type code and Zone code: FOR STATE AGENCY USE ONLY.

Section 3 - Ownership Codes

Item 11 - Check the box next to the appropriate ownership code and enter additional information as requested. Please check only one box in this section. The Secretary of State's office may be contacted at (512) 463-5555 for information regarding Texas file numbers.

Section 4 - Payment Assignment

Item 12 - Use when one payee is assigning payment to another payee. When setting up an assignment payment, fill out this section completely and include a copy of the assignment agreement between the assignee and the assignor.

Section 5 - Comments and Identification

Item 13 - Enter any additional information that may be helpful in processing this applicatiion. Items 14 and 15 are for identification purposes. Always complete the identification section, including comments and authorized signature.

Under Ch. 559, Government Code, you are entitled to review, request and correct information we have on file about you, with limited exceptions in accordance with Ch. 552, Government Code. To request information for review or to request error correction, contact us at the address or phone numbers listed on this form.

Comptroller of Public Accounts FORM 74-176 (Rev.4-14/18)

PRINT FORM | CLEAR FIELDS

Direct Deposit Authorization

This form may be used by vendors, individual recipients or state employees to receive payments from the state of Texas by direct deposit or to change/cancel existing direct deposit information.

Transaction Type

SECTION 1

- ☐ New setup *(Sections 2, 3, 5 and 6)*
- ☐ Change financial institution *(Sections 2, 3, 4, 5 and 6)*
- ☐ Change account number *(Sections 2, 3, 4, 5 and 6)*
- ☐ Change account type *(Sections 2, 3, 4, 5 and 6)*
- ☐ Cancellation *(Sections 2 and 6 - Sections 7 and 8 for state agency use)*

Payee Identification

SECTION 2

Payee type
- ☐ State employee
- ☑ Vendor or other recipient

- ☐ Texas Identification Number (TIN)
- ☐ Individual Taxpayer Identification Number (ITIN)
- ☐ Employer Identification Number (EIN)
- ☐ Social Security Number (SSN) *

Mail code *(If not known, leave blank.)*

Payee name	Phone number ext.

Mailing address	City	State	ZIP code

New Account Information (Setups and Changes) *(Completion by financial institution is recommended.)*

SECTION 3

Financial institution name	City	State

Routing transit number *(9 digits)*	Customer account number *(maximum 17 characters)*	Type of account ☐ Checking ☐ Savings

Financial representative name *(optional)*	Title *(optional)*

Financial representative signature *(optional)*	Phone number *(optional)* ext.	Date *(optional)*

Existing Account Information (Changes Only)

SEC 4

Routing transit number *(9 digits)*	Customer account number *(maximum 17 characters)*	Type of account ☐ Checking ☐ Savings

International Payments Verification *(required)*

SEC 5

Will these payments be forwarded to a financial institution outside the United States?..... ☐ YES ☐ NO

If "YES," also complete the ACH (Direct Deposit) Payment Destination Confirmation (Form 74-227).

Authorization for Setup, Changes or Cancellation *(required)*

SECTION 6

I authorize the Texas Comptroller of Public Accounts to deposit my payments from the state of Texas to my financial institution electronically.
I understand that the Texas Comptroller of Public Accounts will reverse any payments made to my account in error.
I further understand that the Texas Comptroller of Public Accounts will comply at all times with the National Automated Clearing House Association's rules. *(For further information on these rules, please contact your financial institution.)*

sign here ▶ Authorized signature	Printed name	Date

Cancellation by Agency *(for state agency use)*

SEC 7

Reason	Date

Authorized Signature *(for state agency use)*

SECTION 8

sign here ▶ Signature	Date
Phone number ext.	Agency number
Agency name	
Comments	

Please return your completed form to:

Instructions for Direct Deposit Authorization

***You have certain rights** under Chapters 552 and 559, Government Code, to review, request and correct information we have on file about you. To request information for review or to request error correction, use the contact information on this form.*

Section 1: Transaction Type

Select the appropriate transaction type(s).

Section 2: Payee Identification

Select payee type, provide the Texas Identification Number (TIN), Employer Identification Number (EIN) Social Security Number (SSN)* or Individual Taxpayer Identification Number (ITIN) and enter payee contact information.

***Federal Privacy Act Statement**

Disclosure of your Social Security number is required and authorized under law, for the purpose of tax administration and identification of any individual affected by applicable law, 42 U.S.C. sec. 405(c)(2)(C)(i); Texas Govt. Code Sections 403.011, 403.056, and 403.078. Release of information on this form in response to a public information request will be governed by the Public Information Act, Chapter 552, Government Code, and applicable federal law.

Section 3: New Account Information (Needed for setups and changes)

Completion by financial institution is recommended.

Important: Your direct deposit account information may be different from the account information printed on your checks. It is recommended that you contact your financial institution to confirm your direct deposit account information.

Prenote Test:
A prenote test will be sent to your financial institution for the account information provided. The prenote test is for a period of six banking days, and it is sent to your financial institution to verify your account information. If no further action is required by your financial institution, your direct deposit instructions will become effective when the six banking day prenote time frame has expired.

Section 4: Existing Account Information (Needed for changes to existing account information)

When requesting a change to your existing direct deposit account information, you must complete Section 4 with the existing account information for verification purposes. This measure will help the paying state agency verify accuracy of the requested change.

Any change to banking information begins a prenote test period. See explanation in Section 3, above.

Section 5: International Payments Verification

Check "YES" or "NO" to indicate if direct deposit payments to the account information designated in Section 3 of this form will be forwarded to a financial institution outside the United States. If "YES," also complete the ACH (Direct Deposit) Payment Destination Confirmation (Form 74-227).

Section 6: Authorization for Setup, Changes or Cancellation

Must be completed in its entirety, and no alterations to the authorization language will be accepted.

For State Agency Use

Section 7: Cancellation by Agency

Provide reason for cancellation request.

Section 8: Authorized Signature

For state agency use only.

Comptroller of Public Accounts FORM 74-157 (Rev.5-11/6)

PRINT FORM | CLEAR FORM

Payee Change Request

☐ Number Change / Merge

• *Type or print*

SECTION 1

☐ Texas Identification Number change — Old number _____ New number _____

☐ Texas Identification Number merge — Incorrect number _____ Correct number _____

☐ Master Changes

SECTION 2

Texas Identification Number _____

Payee name _____

☐ Change ownership type code to _____

☐ Add / Change owner's name to _____

☐ Add / Change owner's Social Security number to _____

☐ Add / Change partnership information

Partner 1 - Name _____ SSN / EIN _____

Partner 2 - Name _____ SSN / EIN _____

☐ Add / Change Texas file number to _____

☐ Mail Code Changes *(1 form per mail code)*

SECTION 3

Texas Identification Number _____ Mail code _____ *(If unknown, leave blank.)*

Payee name _____

☐ Change name to _____

☐ Change address to _____

City	State	ZIP code	Zone code *(For agency use only)*

☐ Change telephone number to (_____) _____ — _____

SECTION 4

For Agency Use Only

☐ Change security type (0, 1, 2) to ____

☐ Change SIC Code to _____

☐ Add / Change employing agency number to _____

☐ Change master status (A, I) to ____

☐ Change mail code status (A, I) to ____

Authorized Signature

SECTION 5

sign here ▶ Authorized signature *(Applicant or authorized agent - Required)*	Phone number *(Area code and number - Required)*	Date
Agency name		Agency number

Comments

_____

Instructions for Payee Change Request

Payees should submit this form to the agency with which they are conducting business.

NOTE: This form is used only to change existing information for one payee number. To set up either new accounts or additional mail codes, use Form AP-152, the "Application for Texas Identification Number."

- Please type or print all information.
- Do not enter more than 50 characters, including spaces and special characters, in the name or address lines. Only the first 50 characters on each line will be entered in the computer master files.
- Do not use dashes when entering a Social Security number (SSN), Employer Identification Number (EIN) or Comptroller's assigned number.
- Do not use commas or other punctuation.
- Authorized Signature - Must be completed for every change requested.

For Assistance

For additional information or assistance, please contact Fiscal Management at (512) 936-8138 in Austin or (800) 531-5441, ext. 6-8138.

Notice to Paying Agency

State agencies may FAX this form to (512) 475-5424. Please refer to the Texas Identification Number System Guide at https://fmx.cpa.state.tx.us/fmx/pubs/tins/tinsguide for additional information.

Under Ch. 559, Government Code, you are entitled to review, request and correct information we have on file about you, with limited exceptions in accordance with Ch. 552, Government Code. To request information for review or to request error correction, contact us at (800) 531-5441, ext. 6-8138.

01-339
(Rev.4-13/8)

SAVE A COPY | CLEAR SIDE

Texas Sales and Use Tax Resale Certificate

Name of purchaser, firm or agency as shown on permit	Phone *(Area code and number)*
Address *(Street & number, P.O. Box or Route number)*	
City, State, ZIP code	
Texas Sales and Use Tax Permit Number *(must contain 11 digits)*	
Out-of-state retailer's registration number or Federal Taxpayers Registry (RFC) number for retailers based in Mexico *(Retailers based in Mexico must also provide a copy of their Mexico registration form to the seller.)*	

I, the purchaser named above, claim the right to make a non-taxable purchase (for resale of the taxable items described below or on the attached order or invoice) from:

Seller: _____

Street address: _____

City, State, ZIP code: _____

Description of items to be purchased on the attached order or invoice:

_____
_____
_____
_____

Description of the type of business activity generally engaged in or type of items normally sold by the purchaser:

_____
_____
_____

The taxable items described above, or on the attached order or invoice, will be resold, rented or leased by me within the geographical limits of the United States of America, its territories and possessions or within the geographical limits of the United Mexican States, in their present form or attached to other taxable items to be sold.

I understand that if I make any use of the items other than retention, demonstration or display while holding them for sale, lease or rental, I must pay sales tax on the items at the time of use based upon either the purchase price or the fair market rental value for the period of time used.

I understand that it is a criminal offense to give a resale certificate to the seller for taxable items that I know, at the time of purchase, are purchased for use rather than for the purpose of resale, lease or rental, and depending on the amount of tax evaded, the offense may range from a Class C misdemeanor to a felony of the second degree.

sign here ▶ Purchaser	Title	Date

This certificate should be furnished to the supplier.
Do <u>not</u> send the completed certificate to the Comptroller of Public Accounts.

SAVE A COPY | CLEAR SIDE

Texas Sales and Use Tax Exemption Certification

This certificate does not require a number to be valid.

Name of purchaser, firm or agency	
Address *(Street & number, P.O. Box or Route number)*	Phone *(Area code and number)*
City, State, ZIP code	

I, the purchaser named above, claim an exemption from payment of sales and use taxes (for the purchase of taxable items described below or on the attached order or invoice) from:

Seller: _____

Street address: _____ City, State, ZIP code: _____

Description of items to be purchased or on the attached order or invoice:

_____
_____
_____
_____
_____
_____

Purchaser claims this exemption for the following reason:

_____
_____
_____
_____
_____
_____

I understand that I will be liable for payment of all state and local sales or use taxes which may become due for failure to comply with the provisions of the Tax Code and/or all applicable law.

I understand that it is a criminal offense to give an exemption certificate to the seller for taxable items that I know, at the time of purchase, will be used in a manner other than that expressed in this certificate, and depending on the amount of tax evaded, the offense may range from a Class C misdemeanor to a felony of the second degree.

sign here ▶ Purchaser	Title	Date

NOTE: This certificate cannot be issued for the purchase, lease, or rental of a motor vehicle.

THIS CERTIFICATE DOES NOT REQUIRE A NUMBER TO BE VALID.

Sales and Use Tax "Exemption Numbers" or "Tax Exempt" Numbers do not exist.

This certificate should be furnished to the supplier.
Do not send the completed certificate to the Comptroller of Public Accounts.

DESIGN PROFESSIONAL RESPONSIBILITY

The Specification Sections and Drawings authenticated by my Seal and Signature are limited to the following:

REGISTERED ARCHITECT
RICK CANTU
11458
STATE OF TEXAS

12/11/2020

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 1055	CARPENTRY	06 1055 - 1 THRU 06 1055 - 6

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 0150.19	ROOF REPLACEMENT PREPARATION	07 0150.19 - 1THRU 07 0150.19 - 10
07 4680	SIDING	07 4680 – 1 THRU 07 4680 - 5
07 5216	STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE ROOFING	07 5216- 1 THRU 07 5216 - 17
07 5600	FLUID APPLIED FLASHING	07 5600 - 1 THRU 07 5600 - 6
07 5910	ROOFING REPAIRS (MEMBRANE, SHEET METAL AND SKYLIGHTS)	07 5910 - 1 THRU 07 5910 - 11
07 6200	SHEET METAL FLASHING AND TRIM	07 6200 - 1 THRU 07 6200 - 17
07 6210	ES-1 CERTIFICATION OF AUTHORIZED FABRICATOR (SAMPLE)	07 6210 ES-1 - 1 THRU 07 6210 ES-1 -7
07 9200	ROOFING AND WALL SEALANTS	07 9200 - 1 THRU 07 9200 - 6

DIVISION 09 - FINISHES

09 9113	PAINTING	09 9113 - 1 THRU 09 9113 - 4

DIVISION 22 - PLUMBING

22 0500	COMMON WORK RESULTS FOR PLUMBING	22 0500 - 1 THRU 22 0500 - 6

DIVISION 23 - HEATING VENTING AND AIR CONDITIONING

23 0500	COMMON WORK RESULTS FOR HVAC	23 0500 - 1 THRU 23 0500 - 5

DIVISION 26 - ELECTRICAL

26 0500	COMMON WORK RESULTS FOR ELECTRICAL	26 0500 - 1 THRU 26 0500 - 5

LIST OF DRAWINGS FOR TEXAS HEALTH AND HUMAN SERVICES ROOF REPLACEMENT AT RSC BUILDING 511

DRAWING NUMBER	TITLE
T1	TITLE SHEET
R1	OVERALL ROOF PLAN/ELEVATION
D1	DETAILS
D2	DETAILS

End of Design Professional Responsibility Section

Section 01 1000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Project Requirements specified in the Texas Uniform General Conditions for Construction Contracts with HHS Supplementary General Conditions take priority and precedence over any conflicting project requirements listed in this specification section.

1.2 SUMMARY

A. This Section includes the following:
1. Work covered by the Contract Documents.
2. Type of the Contract.
3. Work under other contracts.
4. Use of premises.
5. Owner's occupancy requirements.
6. Work restrictions.
7. Specification formats and conventions.

B. Related Sections include the following:
1. Notice and Information for Proposers: Instructions for Proposal submittal; Notification of Pre-Proposal Conference; Locations for Drawings and Specifications Review; Proposing Procedures; and Award of Contract and Notice to Proceed Information.
2. Proposal Forms: Breakdown of Contract Price; Schedule for Completion; Addenda acknowledgment; Required Proposal Documents and Due Times and Dates.
3. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Rio Grande State Center Roof Replacement at Building 511
1. Project Location(s):
Rio Grande State Center
1401 South Rangerville Road
Harlingen, Texas 78552

B. Owner: **Texas Health and Human Services,** 1401 South Rangerville Road, Harlingen Texas 78552

1. Owner's Representative: Mr. Christopher Roelse; Email: Christopher.Roelse@ hhsc.texas.gov.

C. Architect: **Amtech Solutions, Inc.**, 4444 Corona Drive., Suite, 207, Corpus Christi, TX 78411
1. Architect's Representative: James Robbins, EIT ; (361) 443-9807.

D. The Work consists of the following:

1. The Work includes roof system replacement, tear off and installation, as indicated, for all roof sections of building 511. Other work includes; Metal Soffit Panels, sheet metal edge flashing, cleaning and preparing , as indicated in the Contract Documents. Alternate scopes of work include replacement of North exterior siding and waterproofing, new mechanical unit stand.

1.4 WORK UNDER OTHER CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

1.5 USE OF PREMISES

A. General: Each Contractor shall have limited use of premises for construction operations, including use of Project site, during construction period. Each Contractor's use of premises is limited only by Owner's occupancy and right to perform work or to retain other contractors on portions of Project.

B. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
   1. Limits: Confine constructions operations to building areas where work is indicated and immediately surrounding site areas, as agreed upon by Owner.
   2. Owner Occupancy: Owner does not intend to hold classes in building areas where work is indicated, however furnishings and equipment will remain in place. Allow for Owner access to entire Project site.
   3. Driveways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
      a. Schedule deliveries to minimize use of driveways and entrances.
      b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Use of Existing Building: Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

1.6 OWNER'S OCCUPANCY REQUIREMENTS

A. Full Owner Occupancy: Owner will occupy site and existing buildings during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits, unless otherwise indicated.
   1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
   2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

1.7 WORK RESTRICTIONS

A. On-Site Work Hours: Work shall be generally performed inside the existing building during normal business working hours of 8:00 a.m. to 5:00 p.m., Monday through Friday, except otherwise indicated.
   1. Weekend Hours: No restrictions with Owner approval for interior access if required.
   2. Early Morning Hours: Comply with Owners ordinances.
   3. Hours for Utility Shutdowns: Only with Owner's written permission.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
   1. Notify Architect and Owner not less than four days in advance of proposed utility interruptions.
   2. Do not proceed with utility interruptions without Owner's written permission.

C. Tobacco-Free Site: Tobacco products are not permitted anywhere on Owners Property.

1.8 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 50-division format and CSI/CSC's "MasterFormat" numbering system.
   1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
   2. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
   1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
   2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
      a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 1000

Section 01 2200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Project Requirements specified in the Texas Uniform General Conditions for Construction Contracts with HHS Supplementary General Conditions take priority and precedence over any conflicting project requirements listed in this specification section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for unit prices.

B. Related Sections include the following:
   1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS

A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to the Contract Sum or deducted from the Betterment Fund, Allowances or the Contract Sum by appropriate modification, as quantities of Work required by the Contract Documents are completed, increased or decreased.

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, overhead, and profit.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

PART 2 - PRODUCTS (NOT USED)

2.1 UNIT PRICES:

A. Proposer proposes the following sums as additions to or deductions from the Base Proposal amount for Unit Price Work more fully described in referenced Specification Sections in the Contract Documents. Proposer must provide an amount for each Unit Price item listed or entire Proposal may be considered non-responsive. All items listed below include all labor, materials and OH & P, to install.

Section 01 2200 - UNIT PRICES

Specification Section	Item	Unit Cost	Unit of Measure
07 5216	SBS Modified Bituminous Membrane Roofing:		
	Polyisocyanurate Board 1” Thickness 20 psi	$_____	Per Square Ft.
	Gypsum ½” Cover Board	$_____	Per Square Ft.
	SBS Mod Bit Cap Sheet TG with SRI < 0.75	$_____	Per Square Ft.
	SBS Mod Bit Cap Sheet TG with SRI ≥ 0.75	$_____	Per Square Ft.
	Mechanical Fasteners with Metal Plates	$_____	Per 1000
07 6200	Sheet Metal Work (Following Sizes):		
	4” x 4” Sheet Metal Downspout	$_____	Per Ten Linear Ft.
	18” ES-1 Coping w/ 1 Cleat & Standing Seam	$_____	Per Each
	4” Face ES-1 Fascia W/ Continuous Cleat	$_____	Per Each
	8” 1-piece Fascia / Coping Face Extension	$_____	Per Each
	Conc. Splash block on Traffic Pad	$_____	Per Each
07 0150.19	Metal Deck Repair		
	Overlay 22 Gauge, G90 Galvanized 1.5A, B, or F Metal Roof Deck over Existing Deficient Metal Roof including treatment of rust as specified	$_____	Per Sq. Ft.
06 1055	Treated Wood Blocking Replacement (following Nominal Sizes): FRTW		
	2 x 4	$_____	Per Ten Linear Ft.
	2 x 6	$_____	Per Ten Linear Ft.
	2 x 8	$_____	Per Ten Linear Ft.
	2 x 10	$_____	Per Ten Linear Ft.
	2 x 12	$_____	Per Ten Linear Ft.
	¾” CDX Plywood	$_____	Per 4’ x 8’ Sheet
07 4680	Siding		
	HardiPanel HZ5 Vertical Siding	$_____	Per 4’ x 8’ Sheet
	HardiTrim HZ5 Boards	$_____	Per Ten Linear Ft.
07 9200	Backer Rod and Sealant:		
	Backer Rod and Sealant (up to ¾” joint)	$_____	Per Ten Linear Ft.
22 0500	Plumbing Repairs:		
	2” Gas line Replacement	$_____	Per Ten Linear Ft
	2” Ø Condensate Roof Drain and Strainer	$_____	Each
	1” Ø Copper A/C Condensate Line (w/ Supports)	$_____	Per Ten Linear Ft.
26 0500	Conduit Replacement:		
	1-inch (Conduit, Conductors and Supports)	$_____	Per Ten Linear Ft.
	2-inch (Conduit, Conductors, and Supports)	$_____	Per Ten Linear Ft.

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

A. Required Unit Prices are listed above in Part 2.

END OF SECTION 01 2200

SECTION 01 3100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Project Requirements specified in the Texas Uniform General Conditions for Construction Contracts with HHS Supplementary General Conditions take priority and precedence over any conflicting project requirements listed in this specification section.

1.2 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. Administrative and supervisory personnel.
   2. Project meetings.
   3. Requests for Interpretation (RFIs).

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.

C. Related Sections include the following:
   1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
   2. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
   3. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.4 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other

contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1.5 SUBMITTALS

A. Key Personnel Names: Within 7 days of Notice from Owner of Intent to Award Contract, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.6 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

1.7 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 7 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Discuss items of significance that could affect progress, including the following:
   a. Tentative construction schedule.
   b. Critical work sequencing and long-lead items.
   c. Designation of key personnel and their duties.
   d. Procedures for processing field decisions and Change Orders.
   e. Procedures for RFIs.
   f. Procedures for testing and inspecting.
   g. Procedures for processing Applications for Payment.
   h. Distribution of the Contract Documents.
   i. Submittal procedures.
   j. Preparation of Record Documents.
   k. Use of the premises and existing building.
   l. Work restrictions.
   m. Owner's occupancy requirements.
   n. Responsibility for temporary facilities and controls.
   o. Construction waste management and recycling.
   p. Parking availability.
   q. Office, work, and storage areas.
   r. Equipment deliveries and priorities.
   s. First aid.
   t. Security.
   u. Progress cleaning.
   v. Working hours.
3. Minutes: Architect will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
   a. The Contract Documents.
   b. Related RFIs.
   c. Related Change Orders.
   d. Purchases.
   e. Deliveries.
   f. Submittals.
   g. Possible conflicts.
   h. Compatibility problems.
   i. Time schedules.
   j. Weather limitations.
   k. Manufacturer's written recommendations.
   l. Warranty requirements.
   m. Compatibility of materials.
   n. Acceptability of substrates.
   o. Temporary facilities and controls.

p. Space and access limitations.
q. Regulations of authorities having jurisdiction.
r. Testing and inspecting requirements.
s. Installation procedures.
t. Coordination with other work.
u. Required performance results.
v. Protection of adjacent work.
w. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

1.8 REQUESTS FOR INTERPRETATION (RFIs)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
1. Project name.
2. Date.
3. Name of Contractor.
4. Name of Architect.
5. RFI number, numbered sequentially.
6. Specification Section number and title and related paragraphs, as appropriate.
7. Drawing number and detail references, as appropriate.
8. Field dimensions and conditions, as appropriate.
9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
10. Contractor's signature.
11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

C. Hard-Copy RFIs: CSI Form 13.2A.
1. Identify each page of attachments with the RFI number and sequential page number.

D. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above.
   1. Attachments shall be electronic files in Adobe Acrobat PDF format.

E. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow three working days for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.
   1. The following RFIs will be returned without action:
      a. Requests for approval of submittals.
      b. Requests for approval of substitutions.
      c. Requests for coordination information already indicated in the Contract Documents.
      d. Requests for adjustments in the Contract Time or the Contract Sum.
      e. Requests for interpretation of Architect's actions on submittals.
      f. Incomplete RFIs or RFIs with numerous errors.
   2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
   3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
      a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 5 days of receipt of the RFI response.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within three days if Contractor disagrees with response.

G. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly. Use CSI Log Form 13.2B or Software log with not less than the following:
   1. Project name.
   2. Name and address of Contractor.
   3. Name and address of Architect.
   4. RFI number including RFIs that were dropped and not submitted.
   5. RFI description.
   6. Date the RFI was submitted.
   7. Date Architect's response was received.
   8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 3100

SECTION 01 4000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Project Requirements specified in the Texas Uniform General Conditions for Construction Contracts with HHS Supplementary General Conditions take priority and precedence over any conflicting project requirements listed in this specification section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
   1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
   2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
   3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections include the following:
   1. Division 01 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
   2. Division 01 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
   3. Divisions 02 through 49 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities

having jurisdiction, to establish product performance and compliance with industry standards.

D. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

E. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

F. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

G. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
   1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

H. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Reports: Prepare and submit certified written reports that include the following:
   1. Date of issue.
   2. Project title and number.
   3. Name, address, and telephone number of testing agency.
   4. Dates and locations of samples and tests or inspections.
   5. Names of individuals making tests and inspections.

6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
   1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
   2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

G. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect

installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

H. Windstorm Certification: The Roof System and all rooftop equipment, accessories and appurtenances shall be installed, or otherwise secured in a manner to resist wind pressures as calculated by ASCE-7. All necessary requirements for Compliance with Windstorm Certification (as per the Texas Department of Insurance) shall be provided by the Roofing Contractor and the cost of obtaining windstorm certification shall be included in the Base Bid and Alternate Bid Amounts.

1.7 QUALITY CONTROL

A. Contractor Responsibilities: When specified in individual sections, restrict execution of specified Work to Applicators and Personnel meeting indicated qualifications.
   1. Install all roofing materials using personnel directly employed by Roofing Contractor with NDL certification from roofing material manufacturer - no Sub-Contracting permitted.
   2. Assign a qualified, full time, non-working supervisor to be on Project site at all times during installation of Work. This supervisor to have good communication skills and be able to communicate with School staff and Applicator's workers.
   3. Designate a responsible Project Manager or Superintendent to inspect all installed Work, particularly tie-ins and temporary flashings, at end of each working day and as otherwise required to ensure water-tightness. Inspection to be verified by signature on a Form signifying installation is in accordance with specified requirements.

B. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
   1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
   2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
   3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

C. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
   1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
      a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
   2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
   3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:
   1. Date test or inspection was conducted.
   2. Description of the Work tested or inspected.
   3. Date test or inspection results were transmitted to Architect.
   4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
   2. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 4000

SECTION 01 4200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Project Requirements specified in the Texas Uniform General Conditions for Construction Contracts with HHS Supplementary General Conditions take priority and precedence over any conflicting project requirements listed in this specification section.

1.2 SUMMARY

A. This Section includes:
1. Schedule of references.
2. Definitions of terms commonly used in Contract Documents.
3. Applicability of Industry Standards and abbreviations and acronyms for Standards and Regulations.
4. Abbreviations and acronyms for Industry Organizations, Code Agencies, Federal and State Governmental Agencies.

B. Related Sections include:
1. Division 01 Section “Quality Requirements” for procedures for applying standards.
2. Divisions 02 through 49 Sections for specific Reference Standards that apply to Work in those Sections.

1.3 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.4 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
   1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.5 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association, Inc. (The) www.aluminum.org	(703) 358-2960
AAMA	American Architectural Manufacturers Association www.aamanet.org	(847) 303-5664
ACI	ACI International (American Concrete Institute) www.aci-int.org	(248) 848-3700
ACPA	American Concrete Pipe Association www.concrete-pipe.org	(972) 506-7216

AGC	Associated General Contractors of America (The) www.agc.org	(703) 548-3118
AI	Asphalt Institute www.asphaltinstitute.org	(859) 288-4960
AIA	American Institute of Architects (The) www.aia.org	(800) 242-3837 (202) 626-7300
AISC	American Institute of Steel Construction www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
ALSC	American Lumber Standard Committee, Incorporated www.alsc.org	(301) 972-1700
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
ARMA	Asphalt Roofing Manufacturers Association www.asphaltroofing.org	(202) 207-0917
ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute (See ASCE)	
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers www.ashrae.org	(800) 527-4723 (404) 636-8400
ASME	ASME International (The American Society of Mechanical Engineers International) www.asme.org	(800) 843-2763 (973) 882-1170
ASTM	ASTM International (American Society for Testing and Materials International) www.astm.org	(610) 832-9585
AWPA	American Wood-Preservers' Association www.awpa.com	(205) 733-4077
AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353

BHMA	Builders Hardware Manufacturers Association www.buildershardware.com	(212) 297-2122
BIA	Brick Industry Association (The) www.bia.org	(703) 620-0010
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	(423) 892-0137
CLFMI	Chain Link Fence Manufacturers Institute www.chainlinkinfo.org	(301) 596-2583
CRRC	Cool Roof Rating Council www.coolroofs.org	(866) 465-2523 (510) 485-7175
CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
EIMA	EIFS Industry Members Association www.eima.com	(800) 294-3462 (770) 968-7945
EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org	(914) 332-0040
FM Approvals	FM Approvals www.fmglobal.com	(781) 762-4300
FM Global	FM Global (Formerly: FMG - FM Global) www.fmglobal.com	(401) 275-3000
FMRC	Factory Mutual Research (Now FM Global)	
GA	Gypsum Association www.gypsum.org	(202) 289-5440
GANA	Glass Association of North America www.glasswebsite.com	(785) 271-0208
GRI	(Now GSI)	
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)	
ICRI	International Concrete Repair Institute, Inc.	(847) 827-0830

	www.icri.org	
MBMA	Metal Building Manufacturers Association www.mbma.com	(216) 241-7333
MHIA	Material Handling Industry of America www.mhia.org	(800) 345-1815 (704) 676-1190
MPI	Master Painters Institute www.paintinfo.com	(888) 674-8937
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc. www.mss-hq.com	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(312) 332-0405
NAIMA	North American Insulation Manufacturers Association www.naima.org	(703) 684-0084
NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NeLMA	Northeastern Lumber Manufacturers' Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NFPA	NFPA (National Fire Protection Association) www.nfpa.org	(800) 344-3555 (617) 770-3000
NHLA	National Hardwood Lumber Association www.natlhardwood.org	(800) 933-0318 (901) 377-1818
NLGA	National Lumber Grades Authority www.nlga.org	(604) 524-2393
NRCA	National Roofing Contractors Association www.nrca.net	(800) 323-9545 (847) 299-9070
NRMCA	National Ready Mixed Concrete Association www.nrmca.org	(888) 846-7622 (301) 587-1400

PDCA	Painting & Decorating Contractors of America www.pdca.com	(800) 332-7322 (314) 514-7322
PDI	Plumbing & Drainage Institute www.pdionline.org	(800) 589-8956 (978) 557-0720
SDI	Steel Deck Institute www.sdi.org	(847) 458-4647
SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SJI	Steel Joist Institute www.steeljoist.org	(843) 626-1995
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	(703) 803-2980
SPIB	Southern Pine Inspection Bureau (The) www.spib.org	(850) 434-2611
SPRI	Single Ply Roofing Industry www.spri.org	(781) 647-7026
TMS	The Masonry Society www.masonrysociety.org	(303) 939-9700
UL	Underwriters Laboratories Inc. www.ul.com	(877) 854-3577 (847) 272-8800
UNI	Uni-Bell PVC Pipe Association www.uni-bell.org	(972) 243-3902
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WWPA	Western Wood Products Association www.wwpa.org	(503) 224-3930

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ICC	International Code Council www.iccsafe.org	(888) 422-7233 (703) 931-4533
ICC-ES	ICC Evaluation Service, Inc.	(800) 423-6587

www.icc-es.org (562) 699-0543

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CPSC	Consumer Product Safety Commission www.cpsc.gov	(800) 638-2772 (301) 504-7923
DOE	Department of Energy www.energy.gov	(202) 586-9220
EPA	Environmental Protection Agency www.epa.gov	(202) 272-0167
GSA	General Services Administration www.gsa.gov	(800) 488-3111
NIST	National Institute of Standards and Technology www.nist.gov	(301) 975-6478
OSHA	Occupational Safety & Health Administration www.osha.gov	(800) 321-6742 (202) 693-1999
PHS	Office of Public Health and Science www.osophs.dhhs.gov/ophs	(202) 690-7694
USPS	Postal Service www.usps.com	(202) 268-2000

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080
CFR	Code of Federal Regulations Available from Government Printing Office www.gpoaccess.gov/cfr/index.html	(866) 512-1800 (202) 512-1800
FED-STD	Federal Standard	

	(See FS)	
FS	Federal Specification Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil	(215) 697-2664
	Available from Defense Standardization Program www.dps.dla.mil	
	Available from General Services Administration www.gsa.gov	(202) 619-8925
	Available from National Institute of Building Sciences www.wbdg.org/ccb	(202) 289-7800
FTMS	Federal Test Method Standard (See FS)	
MILSPEC	Military Specification and Standards Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil	(215) 697-2664
UFAS	Uniform Federal Accessibility Standards Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 4200

SECTION 01 5000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Project Requirements specified in the Texas Uniform General Conditions for Construction Contracts with HHS Supplementary General Conditions take priority and precedence over any conflicting project requirements listed in this specification section.

1.2 SUMMARY

A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Sections include the following:
   1. Division 01 Section "Summary" for limitations on utility interruptions and other work restrictions.
   2. Division 01 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
   3. Division 01 Section "Execution" for progress cleaning requirements.

1.3 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Water Service: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top rails.

B. Portable Chain-Link Fencing: Minimum 2-inch, 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide concrete or galvanized steel bases for supporting posts.

C. Lumber and Plywood: Comply with requirements in Division 06 Section "Roofing Carpentry."

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
   1. Store combustible materials apart from building.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
   1. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.

C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

D. Electric Power Service: Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.

E. Telephone Service: Provide temporary or cellular telephone service accessible for use by all construction personnel. Install one telephone line(s) for each field office.
   1. At each telephone, provide a list of important telephone numbers.
      a. Police and fire departments.
      b. Ambulance service.
      c. Contractor's home office.
      d. Architect's office.
      e. Engineers' offices.
      f. Owner's office.
      g. Principal subcontractors' field and home offices.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
   1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241.
   2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Parking: Arrange with Owner for temporary parking areas for construction personnel.
   1. Restrict Contractors' personnel to assigned areas.
   2. When site space is not adequate, provide additional off-site parking.

C. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 01 Section "Execution" for progress cleaning requirements.

D. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
   1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
   1. Comply with work restrictions specified in Division 01 Section "Summary."

B. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

C. Equipment Enclosure Fence: Before construction operations begin, furnish and install enclosure fence around operating equipment in a manner that will prevent people and animals from easily entering area except by entrance gates.
   1. Extent of Fence: As required to enclose operating equipment and staging areas or as determined sufficient to accommodate construction operations.

D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
   1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
   1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
   2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION 01 5000

SECTION 01 6000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Project Requirements specified in the Texas Uniform General Conditions for Construction Contracts with HHS Supplementary General Conditions take priority and precedence over any conflicting project requirements listed in this specification section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

B. Related Sections include the following:
   1. Document 00 2000 “Instructions to Bidders” for Product options and substitution procedures during Bidding.
   2. Division 01 Section "Alternates" for products selected under an alternate.
   3. Division 01 Section "References" for applicable industry standards for products specified.
   4. Division 01 Section "Substitution Request Form" to submit Substitution Requests.
   5. Division 01 Section "Closeout Procedures" for submitting warranties for Contract closeout.
   6. Divisions 02 through 49 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
   3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 SUBMITTALS

A. Product List: Submit a list in tabular form, showing Contractor's selections from specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
   1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
   2. Form: Tabulate information for each product under the following column headings:
      a. Specification Section number and title.
      b. Generic name used in the Contract Documents.
      c. Proprietary name, model number, and similar designations.
      d. Manufacturer's name and address.
      e. Supplier's name and address.
      f. Installer's name and address.
      g. Projected delivery date or time span of delivery period.
      h. Identification of items that require early submittal approval for scheduled delivery date.
   3. Completed List: Within 10 days after date of Notice to Proceed, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
   4. Architect's Action: Architect will respond in writing to Contractor within 5 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.

B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Substitution Request Form: Facsimile of Division 01 Section "Substitution Request Form" provided at end of Section.
   2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      a. Statement indicating why specified material or product cannot be provided.
      b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
      c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 10 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
   a. Form of Acceptance: Signed Division 01 Section “Substitution Request Form”.
   b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

C. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 10 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
      a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
      b. Use product specified if Architect cannot make a decision on use of a comparable product request within time allocated.

D. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.
   1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
   2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:
   1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
   2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
   3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
   4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:
   1. Store products to allow for inspection and measurement of quantity or counting of units.
   2. Store materials in a manner that will not endanger Project structure.
   3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
   4. Store cementitious products and materials on elevated platforms.
   5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
   6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
   7. Protect stored products from damage and liquids from freezing.
   8. For exterior storage of fabricated Products, place on sloped supports, above ground.
   9. Periodically inspect to assure Products are undamaged and are maintained under specified conditions.
   10. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and

limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

B. Product Selection Procedures:

1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.

4. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
5. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.
6. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.
   a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
   b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

A. Timing: Architect will consider requests for substitution if received within 10 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.

B. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
   1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
   2. Requested substitution does not require extensive revisions to the Contract Documents.
   3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   4. Substitution request is fully documented and properly submitted.
   5. Requested substitution will not adversely affect Contractor's Construction Schedule.
   6. Requested substitution has received necessary approvals of authorities having jurisdiction.
   7. Requested substitution is compatible with other portions of the Work.
   8. Requested substitution has been coordinated with other portions of the Work.
   9. Requested substitution provides specified warranty.
   10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and

consistent, is compatible with other products, and is acceptable to all contractors involved.

2.3 COMPARABLE PRODUCTS

A. Conditions: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 6000

SECTION 01 7300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Project Requirements specified in the Texas Uniform General Conditions for Construction Contracts with HHS Supplementary General Conditions take priority and precedence over any conflicting project requirements listed in this specification section.

1.2 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
   1. General installation of products.
   2. Progress cleaning.
   3. Protection of installed construction.
   4. Correction of the Work.

B. Related Sections include the following:
   1. Division 01 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
   2. Division 01 Section "Submittal Procedures" for submitting surveys.
   3. Division 01 Section "Cutting and Patching" for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
   4. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
   1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
   1. Before construction, verify the location and points of connection of utility services.

2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
   1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
      a. Description of the Work.
      b. List of detrimental conditions, including substrates.
      c. List of unacceptable installation tolerances.
      d. Recommended corrections.
   2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
   3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
   4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
   5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

3.3 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.

2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.6 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section "Cutting and Patching."
1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 7300

SECTION 01 7329 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Project Requirements specified in the Texas Uniform General Conditions for Construction Contracts with HHS Supplementary General Conditions take priority and precedence over any conflicting project requirements listed in this specification section.

1.2 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Related Sections include the following:
   1. Divisions 02 through 49 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 5 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
   1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
   2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
   3. Products: List products to be used and firms or entities that will perform the Work.
   4. Dates: Indicate when cutting and patching will be performed.
   5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
   6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
   7. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
   1. Fire-suppression systems.
   2. Mechanical systems piping and ducts.
   3. Control systems.
   4. Communication systems.
   5. Electrical wiring systems.

C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Miscellaneous elements include the following:
   1. Exterior curtain-wall construction.
   2. Equipment supports.
   3. Piping, ductwork, vessels, and equipment.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
5. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
   a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
   b. Restore damaged pipe covering to its original condition.
3. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
4. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 01 7329

SECTION 01 7850 - APPLICATOR WARRANTY

WHEREAS _____

[PRINT OR TYPE FULL NAME OF PROPRIETORSHIP, PARTNERSHIP, CORPORATION, OR JOINT VENTURE]

OF (ADDRESS): _____

HEREIN CALLED THE "CONTRACTOR", HAS PERFORMED ROOFING AND ASSOCIATED WORK ON THE FOLLOWING PROJECT.

OWNER:	**TEXAS HEALTH AND HUMAN SERVICES**		
ADDRESS:	1401 S RANGERVILLE ROAD, HARLINGEN TEXAS 78552		
BUILDING NAME AND AREAS:	**RIO GRANDE STATE CENTER BUILDING 511**		
BUILDING ADDRESS:	1401 S RANGERVILLE ROAD, HARLINGEN TEXAS 78552		
AREA (S) OF WORK:	_____	DATE OF ACCEPTANCE:	_____
WARRANTY PERIOD:	**TWO (2) YEARS**	DATE OF EXPIRATION:	_____

AND WHEREAS THE CONTRACTOR HAS CONTRACTED WITH OWNER TO WARRANT SAID WORK AGAINST LEAKS AND FAULTY OR DEFECTIVE MATERIALS AND WORKMANSHIP FOR DESIGNATED WARRANTY PERIOD.

NOW THEREFORE THE CONTRACTOR HEREBY WARRANTS, SUBJECT TO TERMS AND CONDITIONS HEREIN SET FORTH, THAT DURING WARRANTY PERIOD HE WILL AT HIS OWN COST AND EXPENSE, MAKE OR CAUSE TO BE MADE SUCH REPAIRS TO OR REPLACEMENTS OF SAID WORK AS ARE NECESSARY TO CORRECT FAULTY AND DEFECTIVE WORK, AND AS ARE NECESSARY TO MAINTAIN SAID WORK IN WATERTIGHT CONDITION.

THIS WARRANTY IS MADE SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS:

1. SPECIFICALLY EXCLUDED FROM THIS WARRANTY ARE DAMAGES TO WORK AND OTHER PARTS OF THE BUILDING, AND TO BUILDING CONTENTS, CAUSED BY: (A) LIGHTNING, WINDSTORM IN EXCESS OF 90 MILES PER HOUR WINDSPEED, HAILSTORM, AND OTHER UNUSUAL PHENOMENA OF THE ELEMENTS; (B) FIRE; (C) FAILURE OF ROOFING SYSTEM SUBSTRATE INCLUDING CRACKING, SETTLEMENT, EXCESSIVE DEFLECTION, DETERIORATION, AND DECOMPOSITION; (D) FAULTY CONSTRUCTION OF VENTS, EQUIPMENT SUPPORTS, AND OTHER PENETRATIONS OF THE WORK; (E) REPEATED VAPOR CONDENSATION ON BOTTOM OF ROOFING; AND (F) ACTIVITY ON ROOFING BY OTHER PERSONS INCLUDING CONSTRUCTION CONTRACTORS AND MAINTENANCE PERSONNEL, WHETHER AUTHORIZED OR UNAUTHORIZED BY OWNER. WHEN WORK HAS BEEN DAMAGED BY ANY OF THE FOREGOING CAUSES, WARRANTY SHALL BE NULL AND VOID UNTIL SUCH DAMAGE HAS BEEN REPAIRED BY THE CONTRACTOR, AND UNTIL COST AND EXPENSE THEREOF HAS BEEN PAID BY THE OWNER OR BY ANOTHER RESPONSIBLE PARTY SO DESIGNATED.

2. THE CONTRACTOR IS RESPONSIBLE FOR WORK COVERED BY THIS WARRANTY, BUT IS NOT LIABLE FOR CONSEQUENTIAL DAMAGES TO BUILDING OR BUILDING CONTENTS RESULTING FROM LEAKS OR FAULTS OR DEFECTS OF WORK.

3. DURING WARRANTY PERIOD, IF THE OWNER ALLOWS ALTERATIONS OF WORK BY ANYONE OTHER THAN THE CONTRACTOR, INCLUDING CUTTING, PATCHING AND MAINTENANCE IN CONNECTION WITH PENETRATIONS, ATTACHMENT OF OTHER WORK, AND POSITIONING OF ANYTHING ON ROOF, THIS WARRANTY SHALL BECOME NULL AND VOID UPON DATE OF SAID ALTERATIONS, BUT ONLY TO EXTENT SAID ALTERATIONS AFFECT WORK COVERED BY THIS WARRANTY. IF THE OWNER ENGAGES THE CONTRACTOR TO PERFORM SAID ALTERATIONS, WARRANTY SHALL NOT BECOME NULL AND VOID, UNLESS THE CONTRACTOR, PRIOR TO PROCEEDING WITH SAID WORK, SHALL HAVE NOTIFIED THE OWNER IN WRITING THAT SAID ALTERATIONS WOULD LIKELY DAMAGE OR DETERIORATE THE WORK, THEREBY REASONABLY JUSTIFYING A LIMITATION OR TERMINATION OF THIS WARRANTY.
4. DURING WARRANTY PERIOD, IF ORIGINAL USE OF ROOF IS CHANGED AND IT BECOMES USED FOR, BUT WAS NOT ORIGINALLY SPECIFIED FOR, A PROMENADE, WORK DECK, SPRAY COOLED SURFACE, FLOODED BASIN, OR OTHER USE OR SERVICE MORE SEVERE THAN ORIGINALLY SPECIFIED, THIS WARRANTY SHALL BECOME NULL AND VOID UPON DATE OF SAID CHANGE, BUT ONLY TO EXTENT SAID CHANGES AFFECT WORK COVERED BY THIS WARRANTY.
5. THE OWNER SHALL PROMPTLY NOTIFY THE CONTRACTOR OF OBSERVED, KNOWN, OR SUSPECTED LEAKS, DEFECT OR DETERIORATION, AND SHALL AFFORD REASONABLE OPPORTUNITY FOR THE CONTRACTOR TO INSPECT THE WORK, AND TO EXAMINE EVIDENCE OF SUCH LEAKS, DEFECTS OR DETERIORATION.
6. THIS WARRANTY IS RECOGNIZED TO BE THE ONLY WARRANTY OF THE CONTRACTOR ON SAID WORK, AND SHALL NOT OPERATE TO RESTRICT OR CUT OFF THE OWNER FROM OTHER REMEDIES AND RESOURCES LAWFULLY AVAILABLE TO HIM IN CASES OF ROOFING FAILURE. SPECIFICALLY, THIS WARRANTY SHALL NOT OPERATE TO RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PERFORMANCE OF ORIGINAL WORK.

IN WITNESS THEREOF, THIS INSTRUMENT HAS BEEN DULY EXECUTED THIS _____ DAY OF _____, **2021**.

SIGNATURES:

CONTRACTOR: _____
[PRINT OR TYPE FULL NAME OF PROPRIETORSHIP, PARTNERSHIP, CORPORATION, OR JOINT VENTURE*]

ORGANIZATION: ☐ PROPRIETORSHIP ☐ PARTNERSHIP ☐ CORPORATION ☐ JOINT VENTURE
[CHECK **ONE**] * IF JOINT VENTURE, ADD ADDITIONAL BID FORM SIGNATURE SHEETS FOR EACH JOINT VENTURE MEMBER.

BY: _____ _____
[SIGNATURE] [DATE]

NAME: _____ _____
[PRINT OR TYPE NAME] **[TITLE]**

ADDRESS: _____
[MAILING]

_____
[STREET, IF DIFFERENT THAN MAILING]

TELEPHONE: _____ _____

_____ _____
[PRINT OR TYPE TELEPHONE NUMBER] [PRINT OR TYPE FAX NUMBER]

STATE OF INCORPORATION: (IF APPLICABLE) _____

END OF APPLICATOR WARRANTY

SECTION 01 7851 - CERTIFICATE OF ASBESTOS-FREE CONSTRUCTION

STATE OF TEXAS

COUNTY OF _____

PROJECT:

Owner: **Texas Health and Human Services**

Address: 1401 South Rangerville Road, Harlingen, Texas 78552

Building Name and Areas: **Rio Grande State Center Building 511**

Building Address: 1401 South Rangerville Road, Harlingen, Texas 78552

Area (s) of Work: _____ Date of Acceptance: _____

The undersigned, pursuant to the General and Supplementary Conditions of the Contract for Construction, hereby certifies that to the best of his/her knowledge, information and belief, the materials incorporated into the project, and as used during the construction process, are free of any type of asbestos material.

SEAL:

CONTRACTOR: _____

ADDRESS: _____

_____

_____

BY: _____
(SIGNATURE)

TITLE _____

Subscribed and Sworn to me this _____ day of _____, 2021.

Notary Public: _____

My Commission Expires: _____

November 2020

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Asbestos Inspection Report

November 6, 2020

BUILDING 511
RIO GRANDE STATE CENTER
1401 SOUTH RANGERVILLE ROAD
HARLINGEN, TEXAS

Prepared for:

AMTECH SOLUTIONS, INC.

Prepared by:

ENVIROTEST, LLC
5233 IH 37 SUITE A-3
CORPUS CHRISTI, TEXAS 78408
(361) 887-9400

ENVIROTEST PROJECT NUMBER: 16371

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November 6, 2020

Mr. James Robbins, EIT
Corpus Christi Branch Manager
Amtech Solutions, Inc.
4444 Corona Drive, Suite 207
Corpus Christi, TX 78411

RE: Limited Asbestos Inspection
Building 511
1401 South Rangerville Road
Harlingen, TX 78552
Envirotest Project Number: 16371

Dear Mr. Robbins:

Enclosed is the report for the limited asbestos inspection performed at the Rio Grande State Center in Harlingen TX. The sampling was performed on November 3, 2020 by Mr. Michael Lozano of Envirotest, LLC. Mr. Lozano is licensed by the Texas Department of State Health Services as an Asbestos Inspector (#60-3379).

SCOPE OF WORK

The scope of this project was limited to suspect asbestos-containing materials (ACM) associated with the roof of Building 511 at the above-referenced property. Four (4) samples of suspect asbestos-containing materials were collected. No asbestos was detected in any of the samples collected.

Analytical Methods

All polarized light microscopy (PLM) lab analyses were performed at SanAir Technologies Laboratory Inc. in Powhatan, VA, using standard oil immersion and optical staining techniques. SanAir is an American Industrial Hygiene Association participant laboratory (#162952), a National Institute of Standards and Technology NVLAP-accredited laboratory (#200870) and licensed by the Texas Department of State Health Services (#30-0440) for asbestos laboratory analysis.

LIMITATIONS

This sampling report does not guarantee that asbestos-containing materials are not present. The scope of this project was limited to the materials sampled within this report. Areas such as, but not limited to, beneath

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existing flooring, beneath all subflooring, inside walls, inside doors, interior of ductwork, interior of mechanical and other equipment, interior of piping flanges/valves, interior of electrical components, behind all non-movable finish materials, and all other portions of the building not designated in the Scope of Work, were specifically excluded.

The following analytical results pertain to only the samples analyzed and may not reflect the actual composition of the entire homogeneous area. Envirotest, LLC assumes no responsibility for any subsequent use or interpretations of these analytical results. This report must not be used to claim product endorsement by NVLAP or any other state or federal government agency.

Please call us if you have any questions regarding this inspection report. We appreciate the opportunity to be of service to you.

Sincerely,

Alex Fuhrmann	Michael Lozano	Stacy Kraatz
Asbestos Consultant (#10-5629)	Asbestos Inspector (#60-3379)	South Texas Regional Manager
Envirotest, LLC	Envirotest, LLC	Envirotest, LLC

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List of Definitions

Asbestos-Containing Material (ACM) - any material containing more than one percent asbestos (chrysotile asbestos, amosite asbestos, crocidolite asbestos, tremolite asbestos, anthophyllite asbestos, actinolite asbestos).

Demolition - the wrecking or taking out of any load-supporting structure member and any related razing, removing, or stripping of asbestos products.

Disturbance - contact which releases fibers from ACM or debris containing ACM including activities which that disrupts the matrix of ACM, render ACM friable, or generate visible debris.

Encapsulation - a method of control of asbestos fibers in which the surface of ACM is penetrated by or covered with a liquid coating prepared for that purpose.

Enclosure - the construction of an airtight, impermeable, semi-permanent barrier surrounding asbestos to prevent the release of asbestos fibers into the air.

Fiber - a particulate form of asbestos, 5 micrometers or longer, with a length-to diameter ratio of at least 3 to 1.

Friable Materials - any material that when dry can be crumbled, pulverized, or reduced to powder by hand pressure.

Homogeneous Area - an area of surfacing material or thermal system that is uniform in color and texture.

Intact - means that the ACM has not crumbled, been pulverized, or otherwise deteriorated so that it is no longer likely to be bound with its matrix.

Removal - all operations where ACM is taken out or stripped from structures or substrates, and includes demolition operations.

Renovation - the modifying of any existing structure, or portion thereof.

Repair - overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM attached to structures or substrates.

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Table I – Materials Summary

Table II – Sample Locations / Homogeneous Area Association

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TABLE I - SAMPLE MATERIAL SUMMARY
Building 511, 1401 South Rangerville Road, Harlingen, TX 78552

H.A.*	MATERIAL NAME	MATERIAL DESCRIPTION	MATERIAL LOCATION	CONDITION	FRIABLE	ASBESTOS-CONTAINING MATERIAL
1	Roofing Materials	Black Bituminous Tar with Brown Fibrous Cellulose	Building 505 Roof	Good	No	No

* Homogeneous Area

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TABLE II: SAMPLE NUMBER ⇨ HOMOGENEOUS AREA
Building 511, 1401 South Rangerville Road, Harlingen, TX 78552

SAMPLE #	H.A.*	SAMPLE LOCATION
1	1	West Corner of Roof
2	1	South Corner of Roof
3	1	East Corner of Roof
4	2	North Corner of Roof

* Homogeneous Area

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Sample Location Diagram

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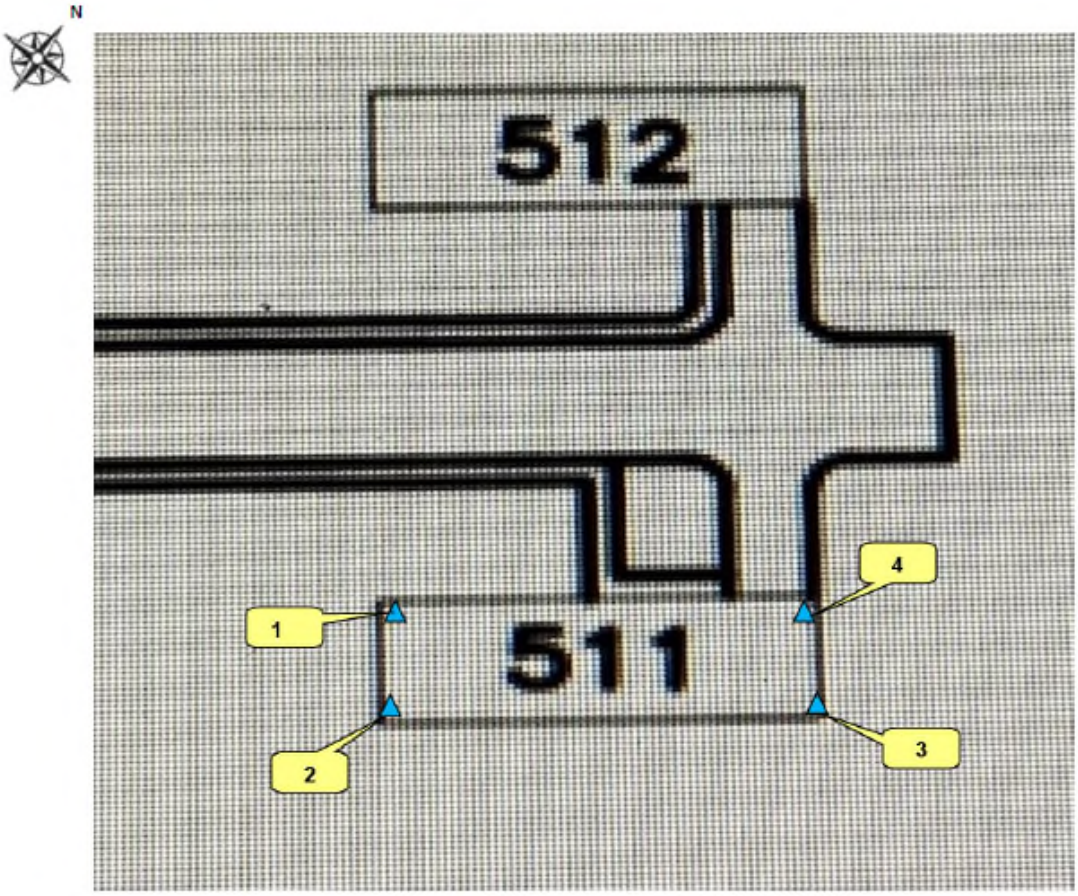
November 2020

Location: Rio Grande State Center Building 511 Roof
Job #: 16371 **Date:** 11-2-2020



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Polarized Light Microscopy Laboratory Analytical Results

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SanAir Technologies Laboratory

The Identification Specialists

Analysis Report prepared for Envirotest, LLC

Report Date: 11/6/2020

Project Name: RGV State Center

Project #: 16371

SanAir ID#: 20061671

NVLAP TESTING

NVLAP LAB CODE 200870-0

1551 Oakbridge Dr. Suite B | Powhatan, Virginia 23139-8061
888.895.1177 | 804.897.1177 | fax: 804.897.0070 | IAQ@SanAir.com | SanAir.com

Page 1 of 5

November 2020

SanAir Technologies Laboratory

SanAir ID Number
20061671
FINAL REPORT
11/6/2020 2:39:10 PM

Name: Envirotest, LLC
Address: 1525 S. Broadway
St. Louis, MO 63104
Phone: 713-782-4411

Project Number: 16371
P.O. Number: 3991
Project Name: RGV State Center
Collected Date: 11/3/2020
Received Date: 11/4/2020 9:50:00 AM

Dear Michael Lozano,

We at SanAir would like to thank you for the work you recently submitted. The 4 sample(s) were received on Wednesday, November 04, 2020 via FedEx. The final report(s) is enclosed for the following sample(s): 1, 2, 3, 4.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

Sandra Sobrino

Sandra Sobrino
Asbestos & Materials Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

Sample conditions:
- 4 samples in Good condition.

November 2020

SanAir Technologies Laboratory

SanAir ID Number
20061671
FINAL REPORT
11/6/2020 2:39:10 PM

Name: Envirotest, LLC
Address: 1525 S. Broadway
St. Louis, MO 63104
Phone: 713-782-4411

Project Number: 16371
P.O. Number: 3991
Project Name: RGV State Center
Collected Date: 11/3/2020
Received Date: 11/4/2020 9:50:00 AM

Analyst: Campos, Angie

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
1 / 20061671-001 Roofing Material, Tar	Black Non-Fibrous Homogeneous	15% Glass	85% Other	None Detected
1 / 20061671-001 Roofing Material, Insulation	Brown Fibrous Homogeneous	95% Cellulose	5% Other	None Detected
2 / 20061671-002 Roofing Material, Tar	Black Non-Fibrous Homogeneous	15% Glass	85% Other	None Detected
2 / 20061671-002 Roofing Material, Insulation	Brown Fibrous Homogeneous	95% Cellulose	5% Other	None Detected
3 / 20061671-003 Roofing Material, Tar	Black Non-Fibrous Homogeneous	15% Glass	85% Other	None Detected
3 / 20061671-003 Roofing Material, Insulation	Brown Fibrous Homogeneous	95% Cellulose	5% Other	None Detected
4 / 20061671-004 Roofing Material, Tar	Black Non-Fibrous Homogeneous	15% Glass	85% Other	None Detected
4 / 20061671-004 Roofing Material, Insulation	Brown Fibrous Homogeneous	95% Cellulose	5% Other	None Detected

Analyst:

Approved Signatory:

Analysis Date: 11/6/2020

Date: 11/6/2020

Page 3 of 5

November 2020

Disclaimer

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Samples are held for a period of 60 days. Fibers smaller than 5 microns cannot be seen with this method due to scope limitations.

For NY state samples, method EPA 600/M4-82-020 is performed.

NYELAP Disclaimer:
Polarized- light microscopy is not consistently reliable in detecting asbestos in floor covering and similar non-friable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.

Asbestos Certifications
NVLAP lab code 200870-0
City of Philadelphia: ALL-460
PA Department of Environmental Protection Number: 68-05397
California License Number: 2915
Colorado License Number: AL-23143
Connecticut License Number: PH-0105
Massachusetts License Number: AA000222
Maine License Number: LB-0075, LA-0084
New York ELAP lab ID: 11983
Rhode Island License Number: PCM00126, PLM00126, TEM00126
Texas Department of State Health Services License Number: 300440
Commonwealth of Virginia 3333000323
Washington State License Number: C989
West Virginia License Number: LT000616
Vermont License: AL166318
Louisiana Department of Environmental Quality: 212253, Cert 05088

Revision Date: 8/14/2020

Page 4 of 5

SECTION 06 1055 - CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
1. Wood blocking, cants, and nailers.
2. Plywood / OSB
3. Sheathing
4. HardieTrim

B. Refer to schedule at end of Section.

1.3 DEFINITIONS

A. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NHLA: National Hardwood Lumber Association.
3. NLGA: National Lumber Grades Authority.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.4 REFERENCES

A. American Lumber Standards Committee (ALSC): National Design Specification for Wood Construction.

B. Product Standard of NBS (PS):
1. PS 1 - Construction and Industrial Plywood.
2. PS 20 - American Softwood Lumber Standard.

1.5 UNIT PRICES - MEASUREMENT AND PAYMENT

A. Replacement of Damaged or Deteriorated Wood Blocking with New Wood Blocking:
1. Basis of Measurement: By the linear foot, by nominal size.
2. Basis of Payment: Includes demolition and disposal of existing blocking materials; installation of new fire retardant treated wood blocking appropriately sized, cut and site treated; anchors, fasteners, and accessories.

1.6 SUBMITTALS

A. Product List: Submit list of proposed Products and manufacturers, including all items specified in Part 2 – Products or otherwise required by the Work.

B. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, finishes, accessories, and locations to a minimum scale of 1-1/2 inch to one foot.

D. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
   1. Power-driven fasteners.
   2. Powder-actuated fasteners.
   3. Expansion anchors.

1.7 QUALITY ASSURANCE

A. Rough Carpentry Lumber: Visible grade stamp, of agency certified by National Forest Products Association (NFPA).

1.8 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

B. Deliver interior wood materials that are to be exposed to view only after building is enclosed and weatherproof, wet work other than painting is dry, and HVAC system is operating and maintaining temperature and humidity at occupancy levels.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
   1. Factory mark each piece of lumber with grade stamp of grading agency.
   2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

B. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 LUMBER

A. General: Provide lumber indicated and lumber for support or attachment of other construction, including the following:
   1. Blocking.
   2. Nailers.
   3. Cants.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 15 percent maximum moisture content and any of the following species:
   1. Mixed southern pine; SPIB.
   2. Spruce-pine-fir; NLGA.
   3. Hem-fir; WCLIB, or WWPA.
   4. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

C. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS (Not used unless specifically identified in the drawings)

A. Preservative Treatment by Pressure Process: AWPA C2 *(except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX)).*
   1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
   2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:
   1. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

2.4 PLYWOOD / OSB

A. DOC PS 1, Exposure 1, CDX Fire Retardant Treated Wood (FRTW), Plugged, in thickness indicated or, if not indicated, minimum 3/4-inch thickness or to match existing.

2.5 TRIM PRODUCTS

A. Fiber-Cement Trim: ASTM C 1186 Grade II, Type A, non-asbestos fiber reinforced, cementitious panels; non-combustible when tested in accordance with ASTM test method E136; manufactured by James Hardie Building Products.
   1. TRIM: Smooth finish. Factory Primed. Sizes as detailed.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
   1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or of Type 304 stainless steel.
   2. Where lumber is pressure-preservative treated with ACQ (Alkaline Copper Quaternary), provide fasteners of Type 304 stainless steel.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1.

F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
   1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
   2. Material (for fastening into ACQ treated lumber): Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

H. Pin Anchors: Zamac Hammer-Screws by Powers. (Drive Pins are not acceptable.)

2.7 ACCESSORIES

A. Reinforcing Wire Mesh: ASTM A 390, galvanized, 20 gauge, 36” wide with 1” nominal openings.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that surfaces are ready to receive work and field measurements are as shown on shop drawings.

B. Verify mechanical, electrical, and building items affecting work of this Section are placed and ready to receive this Work.

C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

D. Where treated lumber is in contact with Ferrous metal Fabrications, such as metal decking, (uncoated, painted, or galvanized), install an isolation layer of Ice and Water Shield between the Metal and the treated Lumber.

3.2 INSTALLATION, GENERAL

A. Discard units or material with defects that might impair quality of work and units that are too small to use in fabricating work with minimum joints.

B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate

nailers, blocking, and similar supports to comply with requirements for attaching other construction.

C. Do not splice structural members between supports, unless otherwise indicated.

D. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

E. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
   1. NES NER-272 for power-driven fasteners.
   2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

F. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

G. Install components with fasteners suited to materials.
   1. Nailable Surfaces: Galvanized or galvanically compatible nails or stainless steel into ACQ treated lumber; sized as follows:
      a. 3/4 and 1-inch materials: 8d nails.
      b. 1-1/2 or 2-inch materials: 16d nails.
   2. Hollow Masonry Walls: Toggle bolts.
   3. Solid Masonry: Zamac Hammer-Screws.
   4. Steel Members: Bolts or Power actuated Hilti pin.
   5. Maximum Spacing: 12-inches on center, unless noted otherwise.
   6. Top of Hollow Masonry Wall: Set 12-inch minimum J-bolts in fully set bed of concrete; minimum 18-inches on center.
   7. Parapet Caps (where indicated in drawings): Helical Ties (See Section 04 0121)

H. Remove all bent or deformed nails from finished work and dispose of.

3.3 WOOD BLOCKING AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

3.4 FIBER-CEMENT PANELS AND TRIM INSTALLATION

A. Install flashing around all wall openings.

B. Install fascia panels over structural framing with joints centered over a framing member.

C. Fasten through panels into structural framing at maximum 16-inches on center.
   1. Fastener Spacing from Panel Edges: Minimum 3/4-inch and maximum 2-inches from sides of trim board and minimum 1-inch from ends.

D. At corners, install first board then align second board to outside edge of first. Do not fasten one fiber-cement board to another fiber-cement board.
   1. Allow 1/8-inch gap between trim and siding.
   2. Seal gap with high quality, paintable caulk.

3.5 FIBER-CEMENT PANELS AND TRIM FINISHING

A. Finish in accordance with Division 09 Section “Painting”.

B. Finish unprimed panels with minimum one coat alkali-resistant primer and two coats acrylic based exterior grade paint within 90 days of installation.

C. Finish factory primed panels with minimum two coats acrylic based exterior grade paint within 180 days of installation.

3.6 REINFORCING WIRE MESH INSTALLATION

A. Install galvanized wire mesh over temporary roof system on the interior vertical wood nailer assembly at all perimeter wood nailer edge conditions.

B. Break wire at a 90 degree angle with a 6” vertical leg.

C. Secure Hot-dipped galvanized steel; 1/8-inch x 1-inch bar stock, pre-drilled holes, with hot dipped galvanized or type 304 stainless steel fasteners into wood nailer assembly; minimum 12” on center.

3.7 PROTECTION

A. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protective Walkways - Traffic Area Protection: Install full sheets of 3/4-inch exterior grade plywood and min. 1/2-inch wood fiber insulation to those areas of new roof surface to be trafficked by personal and wheeled vehicles.

3.8 CLEANING

A. Pick up spilled and unused nails and fasteners daily.

3.9 SCHEDULE

A. Rough Carpentry Work:
   1. Miscellaneous blocking and canting for built-up roofing system and related flashings and sheet metal.
   2. Blocking and canting for roof mounted mechanical items.

END OF SECTION 06 1055

SECTION 07 0150.19– ROOF REPLACEMENT PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Roof tear-off.
2. Partial roof tear-off.
3. Temporary roofing membrane.
4. Roof re-cover preparation.
5. Protection of existing roofing system that is not replaced.
6. Modify rooftop appurtenances where required to achieve minimum recommended heights and clearances for new roof installation.

B. Related Sections:

1. Division 01 Section "Summary" for use of the premises and phasing requirements.
2. Division 01 Section "Construction Progress Documentation" for photographs taken before roof replacement preparation.
3. Division 01 Section "Photographic Documentation" for photographs taken before roof replacement preparation.
4. Division 01 Section "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for roof replacement preparation.
5. Division 22 Section “Common Work Results for Plumbing” for plumbing and piping modifications, removal, and reinstallation.
6. Division 23 Section “Common Work Results for HVAC” for HVAC equipment modifications, removal, and reinstallation.
7. Division 26 Section “Common Work Results for Electrical” for electrical equipment disconnection and reconnection.

1.3 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.4 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

B. Existing Membrane Roofing System: Built-up asphalt, Built-up coal-tar, SBS-modified bituminous roofing membrane, roof insulation, surfacing, and components and accessories between deck and roofing membrane.

C. Substrate Board: Rigid board or panel products placed over the roof deck that serve as thermal barriers, provide a smooth substrate, or serve as a component of a fire-resistance-rated roofing system.

D. Roof Re-Cover Preparation: Existing roofing membrane that is to remain and be prepared for reuse.

E. Roof Tear-Off: Removal of existing membrane roofing system from deck.

F. Lightweight Insulating Concrete Removal: Removal of existing lightweight insulating concrete fill under existing membrane roofing system from structural deck.

G. Partial Roof Tear-Off: Removal of a portion of existing membrane roofing system from deck or removal of selected components and accessories from existing membrane roofing system.

H. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and reinstalled.

I. Existing to Remain: Existing items of construction that are not indicated to be removed.

1.5 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Refer to Division 01 Section "Unit Prices" for description of Work in this Section affected by unit prices.

B. Demolition of Roofing and Insulation:
   1. Basis of Measurement: By the square (100 square feet).
   2. Basis of Payment: Includes complete removal and proper disposal of existing materials.

C. Demolition and Replacement of Damaged or Deteriorated Steel Roof Deck:
   1. Basis of Measurement: By area size(s) listed in Schedule of Unit Prices in Bid Form.
   2. Basis of Payment: Includes complete removal and proper disposal of existing materials.

1.6 SUBMITTALS

A. Product List: Submit list of proposed Products and manufacturers, including all items specified in Part 2 – Products or otherwise required by the Work.

B. Product Data: For each type of product indicated or required to perform the Work.
   1. Provide data for each required product indicating characteristics, performance criteria, mixing and preparation requirements, limitations, and Material Safety Data Sheets (MSDS).

C. Demolition and Removal Procedures and Schedule: Outline all work tasks and schedule them, showing clearly when each area is to be performed. Coordinate with Owner and other contractors to avoid impact to other work Owner's occupancy.

D. Temporary Roofing: Submit Product Data and description of temporary roofing system. If temporary roof will remain in place, submit surface preparation requirements needed to receive permanent roof, and submit a letter from roofing membrane manufacturer stating acceptance of temporary membrane, and that its inclusion will not adversely affect the roofing system's resistance to fire and wind or its FM Global rating.

E. Test Reports:
   1. Fastener Pull Test Results: Provide complete testing results in an organized and understandable format, including:
      a. Roof plan indicating location and designation for each pullout test;
      b. Fastener type(s), installation method(s) used, and value result for each test performed;
      c. Type of tester (equipment) used and calibration certification by Independent Laboratory within previous 12 months.

F. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces that might be misconstrued as having been damaged by roof replacement operations. Submit before Work begins.

G. Landfill Records: Indicate receipt and acceptance of hazardous wastes, such as asbestos-containing material, by a landfill facility licensed to accept hazardous wastes.

H. Roof Replacement Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to roofing system tear-off and replacement including, but not limited to, the following:

   1. Meet with Owner; Architect; Owner's insurer if applicable; testing and inspecting agency representative; roofing system manufacturer's representative; deck Installer; roofing Installer including project manager, superintendent, and foreman; and installers whose work interfaces with or affects roof replacement including installers of roof accessories and roof-mounted equipment.
   2. Methods and procedures related to roof replacement preparation, including membrane roofing system manufacturer's written instructions.
   3. Temporary protection requirements for existing roofing system that is to remain, during and after installation.
   4. Roof drainage during each stage of roof replacement and roof drain plugging and plug removal requirements.
   5. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   6. Existing deck removal procedures and Owner notifications.
   7. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
   8. Structural loading limitations of deck during roof replacement.
   9. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that will affect roof replacement.
   10. HVAC shutdown and sealing of air intakes.
   11. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
   12. Asbestos removal and discovery of asbestos-containing materials.

13. Governing regulations and requirements for insurance and certificates if applicable.
14. Existing conditions that may require notification of Architect before proceeding.

1.7 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately below roof replacement area. Conduct roof replacement so Owner's operations will not be disrupted. Provide Owner with not less than **72** hours' notice of activities that may affect Owner's operations.
   1. Coordinate work activities daily with Owner so Owner can place protective dust or water leakage covers over sensitive equipment or furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below the work area.
   2. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below the affected area. Verify that occupants below the work area have been evacuated before proceeding with work over the impaired deck area.

B. Protect buildings scheduled for roof replacement, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from roof replacement operations.

C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

   1. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.

D. Limit construction loads on roof to **200 lb** rooftop equipment wheel loads and **20 PSF** for uniformly distributed loads.

E. Construction Drawings and Project Manual for existing roofing system are provided for Contractor's reference. Contractor is responsible for conclusions derived from existing documents.

F. Weather Limitations: Proceed with roof replacement preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

G. Hazardous Materials: It is not expected that hazardous materials such as asbestos-containing materials will be encountered in the Work.
   1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

1.8 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during roof replacement, by methods and with materials so as not to void existing roofing system warranty. Notify warrantor before proceeding.
   1. Notify warrantor of existing roofing system on completion of roof replacement, and obtain documentation verifying that existing roofing system has been

inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 INFILL MATERIALS

A. Use infill materials matching existing membrane roofing system materials, unless otherwise indicated.

B. Deck Repair Materials:
   1. Steel Deck: Match existing deck in design, profile, gage and finish. Deck to nest into existing deck with trimmed edges.

C. All Decks: Align top plane with existing deck.

D. Curbs and Support Members: Wood or metal curbs and support items as indicated and required for existing conditions.

E. Miscellaneous Metals: Conform to existing Products and installations.

F. Plumbing and Mechanical Piping: Match existing where practical and conform to products and execution specified in Division 22 Section “Common Work Results for Plumbing”.

G. Mechanical Equipment: Match existing where practical and conform to products and execution specified in Division 23 Section “Common Work Results for HVAC”.

H. Electrical Fixtures and Equipment: Match existing where practical and conform to products and execution specified in Division 26 Section “Common Work Results for Electrical”.

2.2 TEMPORARY ROOFING MATERIALS

A. Design and selection of materials for temporary roofing are responsibilities of Contractor.
   1. Materials selection and design of temporary roofing to be acceptable to selected roofing materials manufacturer.

2.3 AUXILIARY ROOF REPLACEMENT MATERIALS

A. General: Auxiliary roof replacement preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new membrane roofing system.

B. Base Sheet Fasteners: Capped head, factory-coated steel fasteners, listed in FMG's "Approval Guide."

C. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that areas to be demolished are clear of encumbrances.

B. Examine existing mechanical and electrical items to determine conditions and operability.

C. Verify existing roof drains and drain piping are clear of debris, open and functional, that piping is properly connected and sealed to drain bowls and all drain components are in serviceable condition.

D. Notify Owner's Representative in writing of any inoperable items or unsafe conditions.

E. Beginning work indicates acceptance of existing conditions, including operability of mechanical and electrical items.

3.2 PREPARATION

A. Protect existing membrane roofing system that is indicated **not to be reroofed**.

1. Loosely lay 1-inch- minimum thick, molded expanded polystyrene (MEPS) insulation over the roofing membrane in areas indicated. Loosely lay 15/32-inch plywood or OSB panels over MEPS. Extend MEPS past edges of plywood or OSB panels a minimum of 1 inch.
2. Limit traffic and material storage to areas of existing roofing membrane that have been protected.
3. Maintain temporary protection and leave in place until replacement roofing has been completed.

B. Prevent movement or settlement of adjacent structures and paving. Provide bracing and shoring.

C. Protect existing landscaping materials, appurtenances, structures, paving, roofing and siding, roof mounted equipment, roof deck and structures which are not to be demolished.

D. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with roof replacement work that could affect indoor air quality or activate smoke detectors in the ductwork.

E. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

F. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing membrane roofing system components that are to remain.

G. Verify that rooftop utilities and service piping have been shut off before beginning the Work.

3.3 FASTENER PULL-OUT TESTING

A. Perform fastener pull-out tests according to SPRI FX-1 and submit test report to membrane manufacturer to determine fastener pattern required to resist uplift pressure at corners, perimeter, and field of roof as indicated Article on Performance Requirements.
   1. Obtain Architect's approval to proceed with membrane manufacturer's recommended fastening pattern. Architect may furnish revised fastening pattern commensurate with pull-out test results.

3.4 ROOF TEAR-OFF

A. General: Notify Owner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.

B. Remove aggregate ballast from roofing membrane.

C. Remove loose aggregate from aggregate-surfaced built-up bituminous roofing using a power broom.

D. Remove pavers and accessories from roofing membrane. [Store and protect pavers and accessories for reuse. Discard cracked pavers.]

E. Remove protection mat and extruded-polystyrene insulation from protected roofing membrane.
   1. Discard extruded-polystyrene insulation that is wet and exceeds 8 lb/cu. ft.
   2. Store extruded-polystyrene insulation for reuse and protect from physical damage.

F. Roof Tear-Off: Where indicated, remove existing roofing membrane and other membrane roofing system components down to the deck.
   1. Remove cover boards, roof insulation, and substrate boards.
   2. Remove lightweight insulating concrete fill in areas where scheduled for replacement.
   3. Bitumen and felts that are firmly bonded to concrete decks are permitted to remain if felts are dry. Remove unadhered bitumen and felts and wet felts.
   4. Remove excess asphalt from steel deck. A maximum of 15 lb/100 sq. ft. of asphalt is permitted to remain on steel decks.
   5. Remove fasteners from deck or cut fasteners off slightly above deck surface.

G. Partial Roof Tear-Off: At areas scheduled for overlay, where moisture has been detected by the contractor. Remove existing roofing membrane and immediately check for presence of moisture by visually observing cover boards, roof insulation and other substrate boards that will remain.
   1. Coordinate with Owner's inspector to schedule times for tests and inspections immediately after membrane removal.
   2. With an electrical capacitance moisture-detection meter, spot check substrate boards that will remain.
   3. Remove wet or damp boards and roof insulation and replace in kind.

4. Bitumen and felts that are firmly bonded to concrete decks are permitted to remain if felts are dry. Remove unadhered bitumen and felts and wet felts.
5. Remove excess asphalt from steel deck. A maximum of 15 lb/100 sq. ft. of asphalt is permitted to remain on steel decks.
6. Remove fasteners from deck or cut fasteners off slightly above deck surface.

H. Do NOT use power cutting tools on materials identified as ACRM.

3.5 DECK PREPARATION

A. Inspect deck after tear-off of membrane roofing system.

1. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263 or by pouring 1 pint of hot roofing asphalt on deck at start of each day's work and at start of each roof area or plane. Do not proceed with roofing work if moisture condenses under the plastic sheet or if asphalt test sample foams or can be easily and cleanly stripped after cooling.

B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect. Do not proceed with installation until directed by Architect.

C. If exposed metal deck panels are observed to be corroded, immediately notify architect. Do not proceed with installation until directed by Architect.

D. If deck surface is not suitable for receiving new roofing, or if structural integrity of deck is suspect, immediately notify Architect. Do not proceed with installation until directed by Architect.

3.6 DECK AND SUPPORT REPLACEMENT AND REPAIR

A. Replace damaged and deteriorated deck under Unit Prices as required. Replacement deck to match existing. If directed by Architect, prep and coat corroded steel decking under Unit Prices with “1 Step Rust Converter” as specified in Section 09 09113.

B. Install new deck and accessories as required and directed by Architect.

C. Remove damaged and deteriorated deck by cutting in straight lines. Coordinate cuts with structural supports to ensure proper installation of replacement materials.

D. Where necessary, grind away existing welds and protrusions. Provide smooth and even surface for new deck on existing structural framing.

E. Install new deck repair materials with all edges properly supported on structural members or adjacent decking. Secure with approved fasteners, spaced as indicated or maximum 8-inches on center.

3.7 DECK INFILL FOR ABANDONED OPENINGS

A. Prepare openings as indicated in previous Article on Deck and Support Replacement and Repair.

B. Infill roof deck openings where abandoned equipment is removed and not replaced.

1. Install angles or "Z" clips on all sides of opening to receive new roof deck.
2. Provide fire-rated thermal barrier (gypsum board, Dens-Deck®, or approved alternate) on Steel decking under polyisocyanurate insulation.

C. Steel Deck:
1. Type A: Where repair area exceeds two square feet and/or 12-inches on any side.
   a. Remove deteriorated deck to 6-inches into non-deteriorated deck on all sides.
   b. Prime existing deck at attachment points with rust bonding red oxide metal primer.
   c. Install new 22-gage galvanized Steel deck of matching profile over infill area.
      1) Lap each end of new deck a minimum of 6-inches over existing deck.
      2) Lap each side of new deck a minimum of one deck flute over existing deck.
      3) Attach to existing deck with fasteners as recommended by deck manufacturer or as follows:
         a) Ends: #5 TEK screws at maximum 6-inches on center or as directed.
         b) Sides: Self-tapping sheet metal screws at maximum 6-inches on center or as directed.
2. Type B: Where repair area is less than 12-inches on any side.
   a. Remove all rust by wire brushing and apply rust bonding red oxide metal primer.
   b. Install new 18-gage galvanized sheet metal plate over infill area.
      1) Lap all sides of new plate a minimum of 12-inches over existing deck.
         a) Attach to existing deck with fasteners as recommended by deck manufacturer or with self-tapping sheet metal screws at maximum 6-inches on center or as directed.

3.8 INFILL MATERIALS INSTALLATION

A. Immediately after removal of selected portions of existing membrane roofing system, and inspection and repair of deck, if needed, fill in the tear-off areas to match existing membrane roofing system construction.
1. Install new roofing membrane patch over roof infill area. If new roofing membrane is installed the same day tear-off is made, roofing membrane patch is not required.

3.9 TEMPORARY ROOFING MEMBRANE

A. Install approved temporary roofing membrane over area to be reroofed.

B. Remove temporary roofing membrane before installing new roofing membrane.

C. Prepare the temporary roof to receive lightweight insulating concrete fill and new roofing membrane according to approved temporary roofing membrane proposal by patching and repairing temporary roofing membrane. Restore temporary roofing membrane to watertight condition. Obtain approval for temporary roof substrate from roofing membrane manufacturer and Architect before installing new roof.

3.10 EXISTING BASE FLASHINGS

A. Remove existing base flashings around parapets, curbs, walls, and penetrations.
   1. Clean substrates of contaminants such as asphalt, sheet materials, dirt, and debris.

B. Do not damage existing curbs, counter-flashings, metal roofing panels, or other components or equipment that are to remain. Replace items damaged during removal with new Products of same design and quality.

C. Inspect parapet sheathing for deterioration and damage. If parapet sheathing has deteriorated, immediately notify Architect.

3.11 EXISTING VENTILATORS REPLACEMENT

A. Remove all existing non-mechanically operated vents and ventilators and replace with new Products of identical design, function, and configuration, unless otherwise indicated.

B. Install curbs for all ventilators with a deck opening of 12-inches or greater.

3.12 EXISTING MECHANICAL AND ELECTRICAL ITEMS MODIFICATIONS

A. When required to achieve recommended clearances, minimum curb heights, or other modifications, disconnect, modify, and reconnect mechanical and electrical services using qualified and licensed personnel.

B. Do not disrupt any services unless specifically approved by Owner’s Representative and on-site personnel.

C. Restore services and verify proper operational conditions to satisfaction of Owner’s Representative.

3.13 ABANDONED DRAIN PLUG

A. Install plumber’s plug in roof drains scheduled to be abandoned in place.

B. Fill above plumber’s plug with non-shrink grout or Pitch Pan Filler Sealant - Type II.

C. Cover plugged drain with galvanized sheet metal plate; minimum 24-inches square. Attach to deck with three fasteners each side or 8-inches oc if circular plate is used.

3.14 DISPOSAL

A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
   1. Storage or sale of demolished items or materials on-site is not permitted.

B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 07 0150.19

SECTION 07 4680 – SIDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Fiber Cement lap siding, panels, trim, accessories; James Hardi Engineered for Climate Siding.
   2. Accessories:
      a. Fasteners
      b. Sealant
      c. Waterproofing membrane
      d. Flashing

B. Refer to schedule at end of Section.

1.3 RELATED SECTIONS

A. Section 06 1055 – "Carpentry"

B. Section 07 6200 – "Sheet Metal Flashing and Trim"

1.4 REFERENCES
   1. ASTM C1186 – Standard Specification for Flat Fiber Cement Sheets
   2. ASTM D3359 – Standard Test Method for Measuring Adhesion by Tape Test, Tool and Tape.
   3. ASTM E136 – Standard Test method for Behavior of materials in a vertical Tube Furnace at 750 Degrees C.

1.5 UNIT PRICES - MEASUREMENT AND PAYMENT

A. Replacement of Damaged or Deteriorated Wood Blocking with New Wood Blocking:
   1. Basis of Measurement: By the linear foot, by nominal size.
   2. Basis of Payment: Includes demolition and disposal of existing blocking materials; installation of new fire retardant treated wood blocking appropriately sized, cut and site treated; anchors, fasteners, and accessories.

1.6 SUBMITTALS

A. Product List: Submit list of proposed Products and manufacturers, including all items specified in Part 2 – Products or otherwise required by the Work.

B. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, finishes, accessories, and locations to a minimum scale of 1-1/2 inch to one foot.

D. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
   1. Power-driven fasteners.
   2. Powder-actuated fasteners.
   3. Expansion anchors.

E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

F. Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches, representing actual product, color and patterns.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Minimum 2 years' experience with installation of similar products.

B. Mock-up: provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by architect.
   3. Refinish mock-up area as required to produce acceptable work.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.9 WARRANTY

A. Product Warranty: Limited, non-pro-rated product warranty.
   1. HardiPanel HZ5 vertical Siding for 30 years.

B. Product Warranty: Limited, product warranty.
   1. HardiTrim HZ and HZ5 boards for 15 years.

C. Finish Warranty: Limited product warranty against manufacturing finish defects.
   1. When used for its intended purpose, properly installed and maintained according to James Hardie's published installation instructions, James Hardies's ColorPlus finish with ColorPlus Technology, for a period of 15 years from the date of purchase: will not peel; will not crack; and will not chip. Finish warranty includes the coverage for labor and materials.

D. Workmanship Warranty: Application limited warranty for 2 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, GENERAL

A. Acceptable Manufacturer: James Hardie Building Products, Inc. which is located at: 26300 La Alameda Suite 400; Mission Viejo, CA 92691; toll free tel: 866-274-3464; tel: 949-367-4980; Fax: 949-367-4981; email: info@jameshardie.com; web: www.jameshardiepros.com

B. Substitutions: on approval by architect
   1. Requests for substitution will be considered with provisions of section 01 6000.

2.2 Siding

A. Basis of Design: HardiPanel HZ5 Vertical Siding requirements for materials:
   1. Fiber-Cement Siding – Complies with ASTM C1186 Type A Grade II.
   2. Fiber-Cement Siding – Complies with ASTM E 136 as a noncombustible material.
   3. Fiber-Cement Siding – Complies with ASTM E84 Flame Spread Index=0, smoke developed index = 5
   4. CAL-FIRE, Fire Engineered division building materisl listing – wildland urban interface (WUI) Listed Product.
   5. Miami-Dade County, Florida Notice of Acceptance (NOI 07-0418.04.)
   6. Texas Department of Insurance Product Evaluation EC-23.

B. Vertical Siding: HardiPanel HZ5 siding as manufactured by James Hardie Building Products, Inc.
   1. Type: Samples to be provided to Architect and Owner for Selection.

C. Trim: HardiTrim HZ5 boards as manufactured by James Hardie Building Products, Inc.
   1. Type: Samples to be provided to Architect and Owner for Selection.

2.3 Sheathing

A. PLYWOOD
   1. DOC PS 1, Exposure 1, CDX Fire Retardant Treated Wood (FRTW), Plugged, in thickness indicated or, if not indicated, minimum 3/4-inch thickness or to match existing.

2.4 ACCESSORIES
   1. Fasteners: ASTM A 153:
      a. Stainless steel nails with 0.113 inch diameter shank minimum.
      b. Length: 3.5 inch or as required to penetrate structural panels and structural framing a minimum 1-1/2 inches.
   2. Sealant: ASTM C 920, minimum Class 25 sealant.
   3. Water-restrictive barrier: ASTM D226 or other approved water resistive barrier.
   4. Air Barrier:
      a. Material: ASTM E 1677
      b. UV Exposure: minimum three months.
      c. Seam Tape: Air Barrier's manufacturer standard product.
   5. Flashing:
      a. Material: Aluminum
      b. Finish: High-performance organic finish

2.5 FINISHES

A. Factory Primer: Provide Factory applied universal primer.
   1. Primer: Factory Primed by James Hardie.

B. Factory Finish
   1. Product: ColorPlus Technology by James Hardie
   2. Definition: Factory Applied Finish; defined as a finish applied in the same facility and company that manufacturers the siding substrate.
   3. Accessories: Complete finishing system includes pre-package touch-up kit provided by fiber-cement manufacturer. Provide quantities as recommended by manufacturer.
   4. Color: Color chips and verification Samples to be provided to Architect and Owner for Selection.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that surfaces are ready to receive work and field measurements are as shown on shop drawings.

B. Verify mechanical, electrical, and building items affecting work of this Section are placed and ready to receive this Work.

C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

D. Install a water-resistive barrier in accordance with specifications.

3.2 INSTALLATION, GENERAL

A. Discard units or material with defects that might impair quality of work and units that are too small to use in fabricating work with minimum joints.

B. Install in accordance with manufacturer's application instructions, approved submittals, and in proper relationship with adjacent construction.

C. Align Vertical joints of the planks over framing members.

D. Install Metal Z Flashing and provide a ¼" gap at horizontal panel joints.

E. Do not install over damaged or crooked materials.

F. Do no cut siding/cladding to fabricate trim; use trim components.

G. After installation, seal and flash joints, except the overlapping horizontal lap joints.

H. Seal around penetrations.

3.3 PROTECTION

A. Protect installed products until completion of project.

3.4 CLEANING

A. Pick up spilled and unused nails and fasteners daily.

B. Clean products in accordance with manufacturer's care and maintenance instructions.

C. Touch up, repair, or replace damaged products before substantial completion.

END OF SECTION 06 4680

SECTION 07 5216 - STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Qualifications, Standards and Materials for new roof assembly.
2. Cleaning deck surface.
3. Styrene-butadiene-styrene (SBS) modified bituminous membrane roofing.
4. Reinforced PMMA Flashing System.
5. Roof insulation.
6. Traffic pads.

B. Related Sections:
1. Division 06 Section “Roofing Carpentry” for wood nailers, cants, curbs, and blocking.
2. Division 07 Section “Roof Replacement Preparation” for deck repair and replacement.
3. Division 07 Section “Sheet Metal Flashing and Trim” for metal roof penetration flashings, flashings, and counterflashings.
4. Division 22 Section “Common Work Results - Plumbing” for procedures for modifying plumbing and replacement of roof mounted piping.
5. Division 23 Section “Common Work Results - HVAC” for procedures for modifying mechanical equipment.
6. Division 26 Section “Common Work Results - Electrical” for procedures for modifying electrical equipment and devices and repair or replacement of roof mounted electrical items.

1.3 DEFINITIONS

A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

1.4 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. C 728 – Perlite Thermal Insulation Board.
2. C 1289 - Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
3. C 1177 - Glass Mat Gypsum Substrate for Use as Sheathing.
4. D 41 - Asphalt Primer Used in Roofing.
5. D 1668 - Glass Fabrics (Woven and Treated) for Roofing and Waterproofing.
6. D 2178 - Asphalt Glass Felt Used in Roofing.
7. D 4586 - Asphalt Roof Cement - Asbestos Free.
8. D 4601 - Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.

9. D 6163 - Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
10. D 6164 - Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
11. D 6298 - Fiberglass Reinforced Styrene-Butadiene-Styrene (SBS) Modified Bituminous Sheets with a Factory Applied Metal Surface

B. American Society of Civil Engineers (ASCE): ASCE 7-10: Minimum Design Loads for Buildings and Other Structures

C. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

D. Underwriters' Laboratories (UL): Fire Hazard Clarifications.

1.5 PERFORMANCE REQUIREMENTS

A. General Performance: Provide installed membrane roofing and base flashings that withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

C. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7-05 **with a safety factor of 2.0**.

D. Approvals Listing: Provide membrane roofing, base flashings, and component materials that comply with requirements as part of a tested membrane roofing system, for Type I or noncombustible construction, as applicable. Identify materials with Approvals markings.
   1. Fire Classification: Class A

E. Energy Performance: Provide roofing system that meet or exceed any of the following options for Reflectance and Emittance (in accordance with Table C402.3 of the 2015 ICC IEC).
   1. Three-year aged solar reflectance of 0.55 and 3-year aged thermal emittance of 0.75.
   2. Three-year aged solar reflectance index of 64.

1.6 ACTION SUBMITTALS

A. Product List: Submit list of proposed Products and manufacturers, including all items specified in Part 2 – Products or otherwise required by the Work.

B. Product Data: For each type of product indicated.

C. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.
   1. Base flashings and membrane terminations.
   2. Tapered insulation, including slopes.
   3. Crickets, saddles, and tapered edge strips, including slopes.

4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

D. Samples for Verification: For the following products:
1. Sheet roofing materials, including roofing membrane sheet, flashing backer sheet, membrane cap sheet, and flashing sheet, of color specified.
2. Roof insulation.
3. Walkway pads or rolls.
4. Six insulation fasteners of each type, length, and finish.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer and manufacturer to certify and document items in Article on Quality Assurance.

B. Manufacturer's Certification: Provide current letter(s) on membrane manufacturer's letterhead, signed by an authorized employee or corporate officer attesting to following:
1. Products: Certify that roofing system complies with requirements specified in "Performance Requirements" Article. Submit evidence of meeting performance requirements, including that:
   a. Fastener patterns prescribed by manufacturer in Submittal will resist specified uplift pressures, including Safety Factor (times two), calculated according to ASCE/SEI 7.
   b. Roofing system components are physically and chemically compatible for installation as designed, and;
   c. All proposed materials, including those by other manufacturer, are acceptable to membrane manufacturer for use in system, and;
   d. Proposed system meets all criteria for issuance of required manufacturer's warranty.
   e. Specifically identify and define any deviations.
2. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
3. The use of products from various manufacturers must be approved by the Primary Manufacturer of the roof system. Contractor must provide a Systems Letter where Primary Manufacturer declares that all products are compatible and the roof system is eligible to receive a 20-year NDL Warranty. For example, in the case of the reinforced PMMA flashings, if a Manufacturer does not have a PMMA material among their product offerings, they must provide a system letter stating that the use of PMMA from another Manufacturer is compatible with their roof system and approving its use with their products with no effect on the 20 year NDL system warranty that is being provided by roof system manufacturer. Or, else, a substitution can be submitted, for review (following the substitution approval process outlined in the project manual.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.

D. Research/Evaluation Reports: For components of membrane roofing system, from the ICC-ES.

E. Manufacturer's Installation Instructions: Include installation sequence, special instructions and Material Safety Data Sheets (MSDS).

F. Daily Inspection Form: Check list document or form with signature line for Project Manager or Superintendent, signifying installation is in accordance with specified requirements, and tie-ins and temporary flashings are properly sealed at end of each working day and as otherwise required to ensure water-tightness.

G. Manufacturer's Field Reports: Summarize findings of each inspection. Indicate any discrepancies from recommended installation methods, corrective action recommended to installer, and any non-compliant or unsatisfactory conditions.

1.8 CLOSEOUT SUBMITTALS

A. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

B. Maintenance Data: For roofing system to include in maintenance manuals.

C. Project Record Documents: Accurately record exact location of all roof membrane penetrations.

D. Warranties: Sample of special warranties.

1.9 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for membrane roofing system identical to that used for this Project, with minimum five years documented experience, including:
   1. Minimum three projects of comparable size, using specified system**,** installed in the State of Texas within that five-year period.

B. Installer Qualifications: A qualified firm that has been continuously approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product for minimum of three years prior to Bid Date, and that is eligible to receive manufacturer's warranty; with minimum five years documented experience, including:
   1. Minimum three projects of comparable size and specified systems during that time.
   2. Personnel trained and certified by local authority having jurisdiction for all torch applications.

C. Workers: All roofers and laborers to be direct employees of Primary Contractor.
   1. Project Manager and Superintendent: Minimum five years roofing experience and employed by Contractor for a minimum one year prior to Bid Date.
   2. Non-working Supervisor: Able to communicate effectively with School staff and Applicator's workers and employed by Contractor for a minimum one year prior to Bid Date.
   3. Tradesmen: Minimum 50-percent of installation crew to have been employed by Contractor for a minimum six months prior to Bid Date.

D. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

E. Source Limitations: Obtain components for roofing system from or approved by roofing system manufacturer.

F. Perform Work in accordance with NRCA Manual of Roof Maintenance and Roof Repair, NRCA Roofing and Waterproofing Manual, and manufacturer's instructions.

G. Maintain one copy of each document accessible to site.

H. Install all roofing materials using personnel directly employed by Applicator (Roofing Contractor) with NDL certification from roofing material manufacturer - no Sub-Contracting permitted.

I. Assign a qualified, full time, non-working supervisor to be on Project site at all times during installation of Work.

J. Designate a responsible Project Manager or Superintendent to inspect all installed Work, particularly tie-ins and temporary flashings, at end of each working day and as otherwise required to ensure water-tightness.
   1. Verify Inspection by signature on approved Daily Inspection Form signifying installation is in accordance with specified requirements.

K. Maintain and operate all equipment in accordance with equipment manufacturer's instructions.

L. Preinstallation Roofing Conference: Conduct conference at Project site.
   1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
   2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
   3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Review structural loading limitations of roof deck during and after roofing.
   5. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
   6. Review governing regulations and requirements for insurance and certificates if applicable.
   7. Review temporary protection requirements for roofing system during and after installation.
   8. Review roof observation and repair procedures after roofing installation.

1.10 REGULATORY REQUIREMENTS

A. Conform to applicable local codes for roof assembly fire hazard requirements and application procedures.

B. Provide certification of inspection confirming approval of design and installation by authority having jurisdiction.

C. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
   1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
   1. Inspect for damage. Remove from site and replace any damaged materials.
   2. Store products in weather protected environment, clear of ground and moisture.
   3. Stand and store roll materials on end.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
   1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.
   1. Do not store more materials on roof than can be installed within two days, unless specifically approved otherwise.
   2. Maximum Allowable Loading on Roof: 20 pounds per square foot.

1.12 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
   1. Do not apply roofing membrane during inclement weather.
   2. Do not apply roofing membrane to damp or frozen deck surface.
   3. Observe wind chill and other cold weather conditions for proper bituminous application.

1.13 COORDINATION

A. Coordinate work under provisions of Division 01 Section “Administration Requirements.”

B. Coordinate with demolition work and with work of other trades to ensure sufficient materials and manpower are available to completely replace and make watertight all roofing removed each day.

C. Limit tear off of existing roof system and application of new base sheet (if required), including insulation, to amount that can be completely covered with new roof system by end of day.

D. Coordinate installation of associated metal flashings, and roof-related items as work of this Section proceeds. Strip-in all flanged metal components to roof membrane with hot bitumen on same day they are installed.

E. Schedule work to avoid storage on and traffic over finished work.

F. Schedule installation of membrane cap sheet to minimize buck-water laps and within membrane manufacturer's recommended exposure time limit.

1.14 WARRANTY

A. Special Warranty: Manufacturer's standard or customized form, without monetary limitation, 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 leaks.
   1. Special warranty includes membrane roofing, base flashings, PMMA flashings, membrane roofing accessories, roof insulation, fasteners, cover boards, walkway products, roofing accessories, and other components of membrane roofing system.
   2. Warranty Period: 20 years from date of Substantial Completion.

B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form in Division 01 "Applicator Warranty", signed by Installer, covering Work of this Section, including all components of membrane roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
   1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SBS-MODIFIED ASPHALT-SHEET MATERIALS

A. SBS-Modified Bituminous Membrane Roofing:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Soprema
      b. Firestone
      c. Johns Manville
      d. Siplast, Inc.

B. Roofing Membrane Sheet: ASTM D 6163, Grade S, Type I or II, SBS-modified asphalt sheet (reinforced with glass fibers) or ASTM D 6164, Grade S, Type I or II, SBS-modified asphalt sheet (reinforced with polyester fabric); smooth surfaced; suitable for application method specified.

C. Granule-Surface Roofing Membrane Cap Sheet: ASTM D 6163, Grade G, Type I or II, SBS-modified asphalt sheet (reinforced with glass fibers) or ASTM D 6164, Grade G, Type I or II, SBS-modified asphalt sheet (reinforced with polyester fabric); granular surfaced; suitable for application method specified, and as follows:

1. Granule Color: To Meet the Specified Emittance and Reflectance Requirements in section 1.5, E (above).

2.2 BASE SHEET MATERIALS

A. Sheathing Paper: Red-rosin type, minimum 3 lb./100 sq. ft.

B. Base Sheet: ASTM D 4897, Type II, venting, nonperforated, heavyweight, asphalt-impregnated and coated, glass-fiber base sheet with coarse granular surfacing or embossed venting channels on bottom surface.

C. **Primer:** PA-1125 Primer by Siplast, INC to be used metal, concrete, or masonry surfaces. Installed as per manufacturer's requirements. Or an Approved Alternate.

2.3 BASE FLASHING SHEET MATERIALS

A. Backer Sheet: ASTM D 6163, Grade S, Type I or II, SBS-modified asphalt sheet (reinforced with glass fibers) or ASTM D 6164, Grade S, Type I or II, SBS-modified asphalt sheet (reinforced with polyester fabric); smooth surfaced; suitable for application method specified.

B. Granular Surfaced Flashing Sheet: ASTM D 5147, granular surfaced SBS-modified asphalt sheet (reinforced with polyester and glass fiber scrim); suitable for application method specified, and as follows:
   1. Torch applied.
   2. Install at base and wall flashings and at drain and scupper sumps.

C. Glass-Fiber Fabric: Woven glass-fiber cloth, treated with asphalt, complying with ASTM D 1668, Type I.

2.4 UNREINFORCED PMMA COATING MATERIALS (At Roof Drain and scupper sumps and under mechanical equipment.)

A. Paracoat PMMA Surface Coating

2.5 REINFORCED PMMA FLASHING MATERIALS

A. PMMA Vertical Grade Primer: Fast-curing PMMA-based primer for use in vertical applications over concrete, concrete repair materials, masonry, wood and plywood substrates. PMMA Primer:

B. PMMA horizontal Grade Primer: Fast-curing PMMA-based primer for use over horizontal concrete substrates.

C. Primer for Asphaltic Substrates: PMMA-based primer for use over asphaltic materials to serve as a bleed-blocker.

D. Reinforced PMMA Membrane/Flashing System Components
   1. Catalyst: A peroxide-based reactive agent used to induce curing of acrylic resins.
   2. Resin for Flashing Applications: A flexible, polymethylmethacrylate (PMMA) based resin combined with a thixotropic agent for use in combination with fleece fabric to form a monolithic, reinforced flashing membrane.
   3. Resin for Field Membrane Construction: A flexible, polymethylmethacrylate (PMMA) based resin for use in combination with fleece fabric to form a monolithic, reinforced roofing membrane.

4. Fleece for Membrane and Flashing Reinforcement: A non-woven, 110 g/m², needle-punched polyester fabric reinforcement as supplied by the membrane system manufacturer.
5. Color Finish Resin: A pigmented, polymethylmethacrylate (PMMA) based resin for use as a wearing coat over the field of the finished roof membrane and to provide a desired color finish.
6. Clear Finish Resin: A clear, flexible, polymethylmethacrylate (PMMA) based resin for use as a wearing coat over colored quartz.
7. Thixotropic Agent: A liquid additive used to increase the viscosity of the PMMA-based resin products, allowing the resins to be applied over vertical or sloped substrates.
8. Ceramic Granules: No. 11 grade specification ceramic granules suitable for broadcast into the PMMA based wearing layer.
   a. Granule Color: To Meet the Specified Emittance and Reflectance Requirements in section 1.5, E (above).

2.6 AUXILIARY ROOFING MEMBRANE MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.
   1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.

C. Mastic Sealant: Polyisobutylene, plain or modified bitumen; non-hardening, non-migrating, non-skinning, and nondrying.

D. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FMG Approvals 4470; designed for fastening roofing membrane components to substrate; tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.
   1. Mechanical Fasteners for Base Sheet:
      a. Lightweight Concrete Deck: CR Base Sheet Fastener, manufactured by Olympic.
      b. Secondary Disks for All Fasteners: Sized to meet requirements to resist wind up-lift pressures specified in Part 1 “Performance Requirements” of this Section.
   2. Mechanical Fasteners for Flexible Flashing:
      a. Masonry: Specially heat treated, stress relieved, 1-1/4-inch length; Masonry Nail, manufactured by Simplex Nails, Inc.
      b. Wood Blocking: Stainless steel (for fastening into ACQ treated lumber) or high carbon, zinc coated steel (for fastening into non- ACQ treated lumber); annular threaded 1-inch shank nails; with minimum 1-inch x 30 gage metal disk; Roofing Nail, manufactured by Simplex Nails, Inc.
      c. Concrete: Power actuated fasteners, suitable for application.
   3. Mechanical Fasteners for Metal Fabrications (Support Framing): Appropriate for purpose intended, size as required to suit application and achieve positive anchorage to substrate material.

4. Roofing Nails: Stainless steel (for fastening into ACQ treated lumber), hot-dipped galvanized or non-ferrous type (for fastening into non- ACQ treated lumber); with annular rings, size as required to suit application; minimum 11-gage with 3/8-inch diameter head.

E. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

F. Roofing Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 sieve and 98 percent of mass retained on No. 40 sieve, color to match roofing membrane.

G. Metallic Coating (for Metal Clad Flexible Flashing): Elastomeric, coating with metallic pigments, fibers, mineral fillers, and solvents as supplied or recommended by membrane manufacturer; color to match flexible flashing.

H. Termination Bar: Hot-dipped galvanized steel; 1/8-inch x 1-inch bar stock, pre-drilled holes.

I. Vents (if required): Olympic OlyVent one-way breather vents or approved equal.

J. Expansion Joint Filler:
1. Flexible Vapor Retarder: Minimum 60 mil thick vinyl sheet or approved equal.
2. Compressible Insulation: Fiberglass batt insulation or approved equal.

K. Miscellaneous Accessories: Provide those recommended by roofing system manufacturer.

2.7 ROOF INSULATION *(only used for systems not incorporating LWIC)*

A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class I, Grade 3, felt or glass-fiber mat facer on both major surfaces.
1. Maximum Board Size: 48 x 48-inch
2. Minimum Board Thickness: 1-inch.

C. Tapered Insulation: Provide factory-tapered rigid polyisocyanurate insulation boards with the same characteristics as above; fabricated to slope of 1/8-inch per 12 inches unless otherwise indicated.
1. Cricket and Saddle Taper: 1/8, 1/4 or 1/2-inch per foot as necessitated by the edge condition.

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

2.8 INSULATION ACCESSORIES

A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.

B. Insulation Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG Approvals 4470, designed for

fastening roof insulation to substrate, and acceptable to roofing system manufacturer; Roofgrip with Climaseal™ coating, manufactured by Buildex.

1. Length: As required for thickness of material to penetrate substrate 1/2-inch minimum.
2. Top Plate: Plastic or metal washer/disc type, sized to meet requirements to resist wind up-lift pressures specified in Part 1 "Performance Requirements" of this Section.

C. Bead-Applied Insulation Adhesive: Insulation manufacturers recommended bead-applied, low-rise, one-component or multicomponent urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.

D. Full-Spread Applied Insulation Adhesive: Insulation manufacturer's recommended spray-applied, low-rise, two-component urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.

E. Insulation Cant Strips: ASTM C 728, perlite insulation board.

F. Tapered Edge Strips: ASTM C 728, perlite insulation board.

G. Cover Board: ASTM C 1278, cellulosic-fiber-reinforced, water-resistant gypsum substrate, thickness as detailed.

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. USG Corporation; Securock.

H. Cover Board: ASTM C 1177, glass-mat, water-resistant gypsum substrate, thickness as detailed, factory primed.

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; Dens Deck Prime.

I. Substrate Joint Tape: 6- or 8-inch-wide, coated, glass-fiber joint tape.

2.9 WALKWAYS

A. Walkway Pads: Reinforced asphaltic composition pads with slip-resisting mineral-granule surface, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer,

1. Pad Size: 30 X 60-inches.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work and that deck is supported and secured.

B. Verify the deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains or eaves.

C. Verify that deck surfaces are dry and free of snow or ice. Verify flutes of metal deck are clean and dry. Confirm deck dryness by moisture meter; maximum allowable: 12-percent.

D. Verify that roof openings, curbs, pipes, sleeves, ducts, and vents through the roof are solidly set and wood nailing strips are in place.

E. Beginning of installation means installer accepts existing surfaces.

3.2 PREPARATION

A. Protect all building surfaces against damage from roofing work.

B. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions and maintain free from all deleterious material during roofing operations. Remove sharp projections.

C. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

D. Repair or replace damaged or deteriorated deck in accordance with Division 07 Section “Roof Replacement Preparation”.
   1. Steel Deck: Verify Structural integrity. Repair deterioarated metal deck areas with inlay new metal decking patching method.

3.3 INSULATION INSTALLATION

A. Comply with roofing system manufacturer's written instructions for installing roof insulation.

B. Install one lapped base-sheet course and mechanically fasten to substrate according to roofing system manufacturer's written instructions; lap edges 4-inches.
   1. Fasten base sheet to resist uplift pressure at corners, perimeter, and field of roof as determined from Fastener Pull Tests.
   2. If building heights and conditions dictate, fit fasteners with 3-inch or larger disks to provide required wind up-lift resistance.
   3. Minimum Fastener Spacing unless calculated using Fastener Pull Tests:
      a. Laps 6-inches o.c.
      b. Field area in two staggered rows down center at 12-inches o.c.

C. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes more than 45 degrees.

D. Install tapered insulation under area of roofing to conform to slopes indicated.

E. Lay tapered boards for a distance of 24-inches back from roof drains for positive drainage.

F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4-inch with insulation.
   1. Cut and fit insulation within 1/4-inch of nailers, projections, and penetrations.

G. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7-inches or more, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6-inches in each direction.

H. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

I. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

J. Apply no more insulation than can be sealed with membrane in same day.

K. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:
   1. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

L. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type if required by manufacturer or set each layer of insulation in a bead-applied insulation adhesive.
   1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof specified in Part 1 “Performance Requirements” of this Section.
   2. Set each subsequent layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

M. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints a minimum of 6-inches in each direction from joints of insulation below. Loosely butt cover boards together. Tape joints if required by roofing system manufacturer.
   1. Set cover boards in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining cover boards in place.

3.4 ROOFING MEMBRANE INSTALLATION, GENERAL

A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing" and as follows:
   1. Deck Type: **I** (insulated).
   2. Adhering Method: **T** (torched).
   3. Number of SBS-Modified Asphalt Sheets: **Two**.
   4. Surfacing Type: **M** (mineral-granule-surfaced cap sheet).

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Do not torch roof membrane directly to polyisocyanurate insulation (if present).

D. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.

E. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
   1. At end of each day's work, provide tie-offs to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt, with joints and edges sealed.
   2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.

3. Remove and discard temporary seals before beginning work on adjoining roofing.

F. Substrate-Joint Penetrations: Prevent roofing adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.5 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing membrane sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:
1. Torch applied to substrate.
2. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.

B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
1. Repair tears and voids in laps and lapped seams not completely sealed.
2. Apply roofing granules to cover exuded bead at laps while bead is hot.

C. Install roofing membrane sheets so side and end laps shed water.

D. Apply felts smooth, free from air pockets, wrinkles, fishmouths, lap joints, or tears. Do not lay any felts that buck water.

E. Extend membrane sheet up cant strips and a minimum of 2 inches onto vertical surfaces. Torch additional ply of sheet products as recommended to act as base flashing over roofing membrane. Secure to nailing strips at 4 inches o.c.

F. Install two glass fiber ply sheets and bitumen glaze coat for cut-off at end of day's operation. Remove cut-off before resuming roofing.

G. Torch and seal two additional layers of glass fiber ply sheet around roof penetrations.

H. Prohibit foot and cart traffic from newly applied felts. Do not "walk-in" plies.

3.6 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof; secure to substrates according to roofing system manufacturer's written instructions, and as follows:
1. Prime substrates with asphalt primer if required by roofing system manufacturer.
2. Backer Sheet Application: Adhere backer sheet to substrate in cold-applied adhesive at rate required by roofing system manufacturer.
3. Flashing Sheet Application: Torch apply flashing sheet to substrate.
4. Maximum flashing base and top ply width: Width of roll (39-inches).

B. Extend base flashing up walls or parapets a minimum of 8-inches above roofing membrane and 4-inches onto field of roofing membrane.

C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing at 4 inches on center.
1. Maximum Fastener Spacing:

a. Wood: 4-inches on center.
b. Masonry or Concrete: Provide termination bars and fasten 8-inches on center.

2. Seal top termination of base flashing with a strip of glass-fiber fabric set in asphalt roofing cement.

D. Inspect flashing seams and repair unsealed locations, voids, and fishmouths with three course seal or as recommended by membrane manufacturer.

E. Install roofing membrane cap-sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer's written instructions.

F. Coordinate installation of roof scuppers, sumps, and related flashings.

G. Apply metallic coating over all bitumen overruns on flashing surface.

H. Seal flashings and flanges of items penetrating membrane with calk.

3.7 PMMA FLASHING INSALLATION

A. Prep all surfaces and install as per manufacturer’s recommendations.

3.8 WALKWAY INSTALLATION

A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions.
1. Set walkway pads in cold-applied adhesive.
2. Locations: Where indicated and at each rooftop unit (RTU) with operable components, at base and top of each roof ladder, and at each roof hatch.
3. Install a minimum of two pads adjacent to each RTU access panel; roof ladder, and on three sides of each roof hatch; or match width of access panel, ladder, or hatch plus 12-inches each side. Set joints 6 inches apart.

3.9 TORCH APPLICATION SAFETY REQUIREMENTS

A. Maintain a fire watch during all torching applications and for a minimum of 2-hours after torch work is completed for day.

B. Maintain a minimum two (2) fire extinguishers of class and capacity required by local authority having jurisdiction, but not less than 20 pound capacity. Keep fire extinguishers within 25-feet of all torch activity. Provide multiple extinguishers if torching in more than one area.

C. Provide training on proper use of fire extinguishers to all personnel used on project.

D. Turn torches off when not actively in use. Do not place active or hot torches on any combustible materials or surfaces.

E. Remove torches and fuel sources from site at end of each day and when superintendent is not on premises.

F. Secure fuel sources on roof surface to prevent tipping or falling.

3.10 FIELD QUALITY CONTROL

A. Do not perform demolition during roofing operations.

B. Testing Agency: Owner will engage qualified testing and/or inspecting agency to perform tests and inspections and to prepare test reports.

C. Test Cuts: Test specimens may be removed to evaluate problems observed during quality-assurance inspections of roofing membrane as follows:
   1. Approximate quantities of components within roofing membrane will be determined according to ASTM D 3617.
   2. Test specimens will be examined for interply voids according to ASTM D 3617 and to comply with criteria established in Appendix 3 in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."
   3. Repair areas where test cuts were made according to roofing system manufacturer's written instructions.

D. Field inspection and testing will be performed under provisions of Division 01 Section “Quality Requirements”.

E. Upon substantial completion, Owner may have Work inspected using infrared scanning and other appropriate means to establish conditions of completed Project.

F. Correct identified defects or irregularities. Cut out and repair membrane defects before end of each day.

G. Do not perform demolition during roofing operations.

H. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.
   1. Notify Architect and Owner 72 hours in advance of date and time of inspection.

I. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

J. Roofing system will be considered defective if it does not pass tests and inspections.
   1. Perform additional testing and inspecting, at Contractor's expense, to determine if replaced or additional work complies with specified requirements.

3.11 MANUFACTURER'S FIELD SERVICES

A. Provide manufacturer's field services under provisions of Division 01 Section “Quality Requirements.”

B. Request site attendance of roofing materials manufacturers during installation of the work on bi monthly schedule.

C. Post Construction Inspection: Contractor and manufacturer’s representative to inspect roofing installation 23 months after Substantial Completion and prior to expiration of Contractor’s Warranty.

3.12 CLEANING

A. Remove bituminous markings from finished surfaces.

B. In areas where finished surfaces are soiled by asphalt or any other source of soiling caused by work of this Section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

C. Repair or replace defaced or disfigured finished caused by work of this Section.

D. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.13 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of Division 01 Section "Temporary Facilities and Controls."

B. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

C. Where traffic must continue over finished roof installation, protect surfaces.
   1. Minimum Protection: Cushion layer of insulation, minimum 1-inch thick, and one layer of plywood minimum 3/4-inch thick. Ballast plywood for site and personnel protection.

D. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

3.14 FINAL TOUCH UP

A. Upon completion of all roof systems, flashing, accessory work and sheet metal applications, apply two coats of approved aluminum roof coating to accessories not replaced and items as directed by Owner's Representative.
   1. Paint existing pipes, drain strainers, metal vents, and other accessories with Type I aluminum roof coating.
   2. Paint exposed bituminous membrane surfaces with Type II aluminum roof coating.
   3. Apply at recommended rate, or at a minimum rate of 3/4 to 1 gallon/square.

END OF SECTION 07 5216

SECTION 07 56 00 - FLUID APPLIED FLASHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:
1. Qualifications, Standards and Materials.
2. Substrate Preparation.
3. Fluid Applied Flashing Application.

B. Related Sections:
1. Division 06 Section “Roofing Carpentry” for wood nailers, cants, curbs, and blocking and for wood-based, structural-use roof deck panels.
2. Division 07 Section “Roof Replacement Preparation” for deck repair and replacement.
3. Division 07 Section “Sheet Metal Flashing and Trim” for metal flashings and counter-flashings.

1.3 DEFINITIONS

A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

1.4 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. D 41 - Asphalt Primer Used in Roofing.
2. D 312 - Asphalt Used in Roofing.
3. D 1668 - Glass Fabrics (Woven and Treated) for Roofing and Waterproofing.
4. D 6163 - Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
5. D 6164 - Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

B. National Roofing Contractors Association (NRCA):
1. Manual of Roof Maintenance and Roof Repair.
2. Roofing and Waterproofing Manual.

C. Underwriters’ Laboratories (UL): Fire Hazard Clarifications.

1.5 PERFORMANCE REQUIREMENTS

A. General Performance: Provide fluid applied roofing and flashing systems that withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Fluid applied roofing and flashings shall remain watertight.

B. Material Compatibility: Provide fluid applied materials that are compatible with one another and contiguous roofing and flashing membranes under conditions of service and application required, as demonstrated by fluid applied materials manufacturer based on testing and field experience.

1.6 ACTION SUBMITTALS

A. Product List: Submit list of proposed Products and manufacturers, including all items specified in Part 2 – Products or otherwise required by the Work.

1.7 INFORMATIONAL SUBMITTALS

A. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install fluid applied flashing system.
   1. List of minimum three projects of comparable size and specified systems during that time.

B. Manufacturer's Installation Instructions: Include installation sequence, special instructions and Material Safety Data Sheets (MSDS).

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: For Fluid Applied Flashing to include in maintenance manuals.

1.9 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.10 QUALITY ASSURANCE

A. Installer Qualifications: A qualified firm that has been continuously approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product for minimum of two years prior to Bid Date, and that is eligible to receive manufacturer's warranty; with minimum three years documented experience, including:
   1. Minimum three projects of comparable size and specified systems during that time.

B. Workers: All roofers and laborers to be direct employees of Primary Contractor.
   1. Project Manager and Superintendent: Minimum five years roofing experience and employed by Contractor for a minimum one year prior to Bid Date.
   2. Non-working Supervisor: Able to communicate effectively with staff and Applicator's workers and employed by Contractor for a minimum one year prior to Bid Date.
   3. Tradesmen: Minimum 50-percent of installation crew to have been employed by Contractor for a minimum six months prior to Bid Date.

C. Source Limitations: Obtain components for roofing system from or approved by roofing system manufacturer.

D. Perform Work in accordance with NRCA Manual of Roof Maintenance and Roof Repair, NRCA Roofing and Waterproofing Manual, and manufacturer's instructions.
   1. Maintain one copy of each document accessible to site.

E. Install all fluid-applied flashing materials using personnel directly employed by Applicator (Roofing Contractor) with NDL certification from material manufacturer - no Sub-Contracting permitted.

F. Designate a responsible Project Manager or Superintendent to inspect all installed Work, particularly tie-ins and temporary flashings, at end of each working day and as otherwise required to ensure water-tightness.

G. Deliver materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
   1. Inspect for damage. Remove from site and replace any damaged materials.
   2. Store products in weather protected environment, clear of ground and moisture.
   3. Stand and store roll materials on end.

H. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
   1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

I. Handle and store materials and place equipment in a manner to avoid permanent deflection of deck.
   1. Do not store more materials on roof than can be installed within two days, unless specifically approved otherwise.
   2. Maximum Allowable Loading on Roof: 20 pounds per square foot.

J. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter.
   1. Keep away from open fire, flame, or any ignition source.
   2. Avoid skin and eye contact with this material. Avoid breathing fumes.
   3. Do not eat, drink, or smoke in the application area.
   4. Vapors may form explosive mixtures with air.

1.11 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit fluid applied system to be installed according to manufacturer's written instructions and warranty requirements.
   1. Do not apply fluid applied flashing during inclement weather.
   2. Do not apply fluid applied flashing to damp or frozen surfaces.
   3. Observe wind chill and other cold weather conditions for proper fluid applied flashing application.

1.12 COORDINATION

A. Coordinate work under provisions of Division 01 Section “Administration Requirements.”

B. Coordinate with demolition work and with work of other trades to ensure sufficient materials and manpower are available to completely install and make watertight all fluid applied flashing installed each day.

C. Coordinate installation of associated metal flashings, and roof-related items as work of this Section proceeds.

D. Schedule work to avoid storage on and traffic over finished work.

1.13 WARRANTY

A. Special Warranty: Work described in this specification section shall be included in roofing membrane system Manufacturer's warranty, without monetary limitation (no-dollar limit), in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide Products from the selected roofing materials manufacturer:

B. Basis-of-Design Product: Subject to compliance with requirements, provide one of the following:
1. Siplast, Inc: “Parapro 123 Flashing System”
2. Johns Manville: “Perma Flash System”.
3. Or Equal; with Architect’s prior approval and acceptable to roofing membrane Manufacturer for inclusion in roofing system NDL Warranty.

2.2 SYSTEM DESCRIPTION

Fluid Applied Flashing System: A liquid applied, flexible, monolithic membrane formed by combination of liquid resin and fleece fabric.

2.3 PERFORMANCE REQUIREMENTS

A. Material Compatibility: Provide fluid applied roofing and flashing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

2.4 FLUID APPLIED FLASHING MATERIALS

A. Roofing Fluid Resin: Material manufacturer’s flexible, proprietary waterproofing resin intended for low slope installation.
1. Minimum Thickness: 90 mils.

B. Flashing Fluid Resin: Material manufacturer’s flexible, proprietary waterproofing resin with modifying agents as required for vertical slope installation.
1. Minimum Thickness: 90 mils.

C. Membrane and Flashing Fleece Reinforcement: Fluid-applied roofing and flashing system manufacturer's standard non-woven, needle-punched polyester fabric reinforcement.

2.5 ACCESSORIES

A. Cleaning and Preparation Materials: Material manufacturer's recommended materials for cleaning, preparing, filling, and priming existing substrates.

B. Finishing Materials: Material manufacturer's recommended materials for surface anti-skid texture, coloration, and protection.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work and that substrate is sound and properly supported and secured.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect all building surfaces against damage from fluid applied flashing work.

B. Clean substrate of dust, debris, moisture, and other substances detrimental to fluid applied flashing installation according to system manufacturer's written instructions and maintain free from all deleterious material during fluid applied flashing operations. Remove sharp projections.

C. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.

3.3 INSTALLATION, GENERAL

A. Coordinate installation of fluid applied flashing system so components of the fluid applied flashing and adjacent roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at end of workday or when rain is forecast.

3.4 FLUID APPLIED FLASHING INSTALLATION

A. Flashing Application: Wipe membrane surfaces to be lapped with field membrane with approved cleaner/solvent. Allow membrane surface to dry 20 minutes minimum.
   1. Mask perimeter of area to receive flashing system with tape. Apply resin primer to substrates requiring additional preparation and allow primer to set.
   2. Apply base coat of flashing resin using a roller at minimum rate specified by manufacturer.
   3. Work fleece reinforcement into wet, catalyzed resin using a brush or roller to fully embed fleece in the resin and remove trapped air.
      a. Lap fleece layers 2-inches minimum and apply an additional coat of catalyzed resin between layers of overlapping fleece.
   4. Apply top coat of catalyzed resin at minimum rate specified by manufacturer immediately following embedment of fleece, ensure full fleece saturation.
   5. Ensure flashing resin extends 1/4-inch minimum beyond fleece.

6. Remove tape before catalyzed resin sets.

B. Color Finish Application: Apply only after roofing and flashing systems have cured 2-hours minimum.
   1. Wipe surfaces to receive color finish layer with approved cleaner/solvent. Allow surface to dry 20 minutes minimum.
   2. Apply top coat of catalyzed color finish resin at minimum rate specified by manufacturer.
   3. Allow 2 hours cure time prior to exposing the membrane to foot traffic.

3.5 FIELD QUALITY CONTROL

A. Do not perform demolition during fluid applied flashing installation.

B. Field inspection and testing will be performed under provisions of Division 01 Section "Quality Requirements".

C. Correct identified defects or irregularities. Cut out and repair fluid applied flashing defects before end of each day.

3.6 CLEANING

A. In areas where finished surfaces are soiled by asphalt or any other source of soiling caused by work of this Section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

B. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.7 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of Division 01 Section "Temporary Facilities and Controls."

B. Protect fluid applied flashing system from damage and wear during remainder of construction period.

C. Correct deficiencies in or remove fluid applied flashing system that does not comply with requirements, repair substrates, and repair or reinstall fluid applied flashing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

END OF SECTION 07 5600

SECTION 07 5910 – ROOFING REPAIRS (MEMBRANE AND SHEET METAL)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes repair procedures for the following:

1. Asphaltic Multiply Roof System.
2. Coal Tar Pitch Multiply Roof System.
3. Bituminous Membrane Roofing.
4. Sheet Metal Repairs.

B. Related Sections include the following:

1. Division 1 Section “Unit Prices”
2. Division 1 Section “Photographic Documentation”
3. Division 1 Section “Temporary Facilities and Controls” for temporary construction and environmental-protection measures for reroofing preparation.
4. Division 1 Section “Execution” for Cutting and Patching Procedures for reroofing preparation.
5. Division 6 Section “Carpentry (for Roofing)” for wood nailers, cants, curbs, and blocking.
6. Division 7 Section “Fluid Applied Flashing”
7. Division 7 Section "Sheet Metal Flashing and Trim" for gutters and downspouts.
8. Division 22 Section “Common Work Results for Plumbing”
9. Division 23 Section “Common Work Results for HVAC”
10. Division 26 Section “Common Work Results for Electrical”

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

B. Existing Membrane Roofing System: Built-up asphalt, built-up coal tar pitch, bituminous roofing membrane, surfacing, and components and accessories between deck and roofing membrane.

C. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and reinstalled.

D. Existing to Remain: Existing items of construction that are not indicated to be removed.

1.4 SUBMITTALS

A. Product List: Submit list of proposed Products and manufacturers, including all items specified in Part 2 – Products or otherwise required by the Work.

B. Product Data: For each type of product indicated.

C. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces that might be misconstrued as having been damaged by reroofing operations. Submit before Work begins.

D. Landfill Records: Indicate receipt and acceptance of hazardous wastes, such as asbestos-containing material, by a landfill facility licensed to accept hazardous wastes.

E. Manufacturer's Installation Instructions: Include installation sequence, special instructions and precautions, and Material Safety Data Sheets (MSDS).

F. Fabricated Metal Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
2. Metal Wall Panel: 36” wide by actual length of wall, including waterproofing underlayment, sub-girts, and closures.
3. Trim, Metal Closures, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.

G. Accessories and Miscellaneous Materials: Full-size Sample

1.5 QUALITY ASSURANCE

A. Roofing Repair Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roofing repairs including, but not limited to, the following:

1. Meet with Owner; Architect; Owner's insurer if applicable; testing and inspecting agency representative; roofing system manufacturer's representative; deck Installer; roofing Installer including project manager, superintendent, and foreman; and installers whose work interfaces with or affects reroofing including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing repair preparation, including membrane roofing system manufacturer's written instructions.
3. Review temporary protection requirements for existing roofing system that is to remain, during and after installation.
4. Review roof drainage during each stage of repairs and review roof drain plugging and plug removal procedures.

5. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
6. Review procedures to determine condition and acceptance of existing roofing and base flashing substrate to be repaired.
7. Review structural loading limitations of deck during reroofing.
8. Review base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that will affect repairs.
9. Review HVAC shutdown and sealing of air intakes.
10. Review shutdown of fire-suppression, -protection, and -alarm and -detection systems.
11. Review procedures for asbestos removal or unexpected discovery of asbestos-containing materials.
12. Review governing regulations and requirements for insurance and certificates if applicable.
13. Review existing conditions that may require notification of Architect before proceeding.

B. Perform Work in accordance with NRCA Manual of Roof Maintenance and Roof Repair, NRCA Roofing and Waterproofing Manual, and manufacturer's instructions.

C. Maintain one copy of each document accessible to site.

D. Make all roofing repairs using personnel directly employed by Applicator (Roofing Contractor) with NDL certification from roofing material manufacturer - no Sub-Contracting permitted.

E. Assign a qualified, full time, supervisor to be on Project site at all times during Work.

F. Designate a responsible Project Manager or Superintendent to inspect all installed Work, particularly tie-ins and temporary flashings, at end of each working day and as otherwise required to ensure water-tightness.

1. Verify Inspection by signature on approved Daily Inspection Form signifying installation is in accordance with specified requirements.

G. Maintain and operate all kettles, fume recovery systems, luggers, accessories, and other equipment in accordance with equipment manufacturer’s instructions.

1. Kettles: Utilize equipment with built-in, operable and visible thermostat to measure temperature of heated bitumen. Immediately replace or repair broken or malfunctioning thermostats.

H. Do not use same kettle for different bitumen materials or types. If two or more bitumens are required, provide a separate kettle for each type and clearly label each with bitumen type it contains.

I. Verify actual measurements by field measurements before fabrication or ordering materials/accessories;

1.6 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately below reroofing area. Conduct roof repairs so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.

1. Coordinate work activities daily with Owner so Owner can place protective dust or water leakage covers over sensitive equipment or furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below the work area if desired.
2. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below the affected area. Verify that occupants below the work area have been evacuated prior to proceeding with work over the impaired deck area.

B. Protect building to be repaired, adjacent roofing, accessories, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from repair operations.

C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

D. Owner assumes no responsibility for condition of areas to be repaired.

1. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.

E. Limit construction loads on roof to 200 pound rooftop equipment wheel loads and 20 PSF for uniformly distributed loads.

F. Weather Limitations: Proceed with repair preparation only when existing and forecasted weather conditions permit Work to proceed without water entering into existing roofing system or building.

1.7 WARRANTY

A. Special Project Warranty: Work described in this section shall be included in Applicator's warranty, on warranty form in Division 01 "Applicator Warranty", signed by Installer, covering Work of this Section.

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 REPAIR AND INFILL MATERIALS

A. Use repair and infill materials matching existing membrane roofing system materials, unless otherwise indicated.

2.2 BUILT-UP ASPHALT SHEET AND BITUMINOUS MATERIALS

A. Manufacturers: Match existing system and materials where it can be determined or if there is a Warranty in place. Subject to compliance with requirements, provide products by one of the following:

1. Tremco
2. Firestone Building Products
3. GAF Materials Corporation
4. Johns Manville International, Inc.
5. Siplast, Inc.

B. Sheet Materials:

1. Sheathing Paper: Red-Rosin type, 3 lb/100 sq. ft.
2. Vapor Retarder (if required): ASTM D 2178, Type IV; asphalt impregnated glass fiber felt; FM 1-28 Class 1 and approved by ply sheet manufacturer.
3. Base Sheet: ASTM D 4897, Type II, venting, nonperforated, heavyweight, asphalt-impregnated and -coated, glass-fiber base sheet with coarse granular surfacing or embossed venting channels on bottom surface.
4. Base Sheet: ASTM D 6163, Type I, Grade S, SBS-modified bituminous sheet, syntan acrylic coated surface; suitable for application method specified.
5. Base Sheet: ASTM D 6222; polyester reinforced, APP-modified asphalt sheet; smooth surfaced; suitable for application method specified.
6. Cap Sheet (if required): ASTM D 6222, Type I, Grade G, polyester reinforced, granule surfaced, APP-modified asphalt sheet; suitable for application method specified.
7. Flashing Sheet (if required): ASTM D 6222, Type I, Grade G, polyester reinforced, granule surfaced, APP-modified asphalt sheet; suitable for application method specified and as follows:
   a. Granule Color: White.
8. Glass-Fiber Fabric (if required): Woven glass-fiber cloth, treated with asphalt, complying with ASTM D 1668, Type I.

C. Bituminous Materials:

1. Liquid-type materials shall comply with VOC limits of authorities having jurisdiction.
2. Asphalt Primer: ASTM D 41.
3. Roofing Asphalt Bitumen (if required): ASTM D 312, Type IV as recommended by built-up roofing system manufacturer for application.
4. Plastic Cement: ASTM D 4586, Type I, cutback asphalt type, asbestos free.

2.3 PMMA (POLYMETHYLMETHACRYLATE) COATING MATERIALS

A. Primer for Vertical/Horizontal Grades: Fast-curing PMMA-based primer for use over concrete, masonry, wood, and asphaltic substrates. Minimum application rate is 135 square feet per 10-KG Pail (.074kg/sf).

B. Unreinforced PMMA Application: A high performance, multi-component, fast curing, and flexible polymethylmethacrylate based resin providing a moisture

resistant barrier in 30-minutes and stress resistant in 2-hours. Minimum application rate is 120 square feet per 20-KG Pail (.167 kg/sf).

C. Reinforced PMMA Application: A high performance, multi-component, fast curing, and flexible polymethylmethacrylate based resin for use in combination with fleece fabric to form a monolithic, reinforced roofing membrane. Minimum application rate is 90 square feet per 20-KG Pail (.223 kg/sf).

D. Unreinforced/Reinforced PMMA System Components

1. Liquid Catalyst: A high viscosity liquid reactive agent used to induce curing of acrylic resins.
2. Prep-Cleaner: Clear, blended solvents to clean metals, plastics, and areas between staged PMMA resins.
3. Fleece for Membrane and Flashing Reinforcement: A non-woven, 110 g/m², needle-punched polyester fabric reinforcement as supplied by the PMMA manufacturer.

2.4 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class I, Grade 3, felt or glass-fiber mat facer on both major surfaces.

1. Maximum Board Size: 48 x 48-inch
2. Minimum Board Thickness: 1-1/2 inch.

C. Cover Board: ASTM C 1177, glass-mat, water-resistant gypsum substrate, thickness as detailed, factory primed.

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; Dens Deck Prime.

D. Tapered Insulation: Provide factory-tapered rigid polyisocyanurate insulation boards with the same characteristics as above; fabricated to slope of 1/2-inch per 12 inches unless otherwise indicated.

2.5 INSULATION ACCESSORIES

A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.

B. Insulation Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG Approvals 4470, designed for fastening roof insulation to substrate; tested by manufacturer for required pullout strength.

1. Length: As required for thickness of material to penetrate substrate 3/4-inch minimum.
2. Top Plate: Plastic or metal washer/disc type, sized to meet requirements to resist wind up-lift pressures.

C. Bead-Applied Insulation Adhesive: Insulation manufacturers recommended bead-applied, low-rise, one-component or multicomponent urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.

D. Full-Spread Applied Insulation Adhesive: Insulation manufacturer's recommended spray-applied, low-rise, two-component urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.

E. Insulation Cant Strips: ASTM C 728, perlite insulation board.

F. Tapered Edge Strips: ASTM C 728, perlite insulation board.

2.6 AUXILIARY ROOFING REPAIR MATERIALS

A. General: Auxiliary repair preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing membrane roofing system.

B. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.

C. Cold-Applied Adhesive: Roofing system manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with built-up roofing base flashings.

D. Cold-Applied Adhesive: Roofing system manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with SBS roofing membrane and base flashings; ASTM D 3019, premium SBS adhesive; Siplast, PA-311; GAF Matrix Adhesive.

E. Mastic Sealant: Polyisobutylene, plain or modified bitumen, non-hardening, non-migrating, non-skinning, and nondrying.

F. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FM 4470; designed for fastening roofing membrane components to substrate; tested by manufacturer for required pullout strength.

1. Lightweight Concrete Deck: 1.75 CR Base Sheet Fastener, manufactured by Olympic.
2. Mechanical Fasteners for Metal Fabrications: Appropriate for purpose intended, size as required to suit application and achieve positive anchorage to substrate material.
3. Roofing Nails: Stainless steel (for fastening into ACQ treated lumber), hot-dipped galvanized or non-ferrous type (For fastening into non-ACQ treated lumber); with annular rings, size as required to suit application; minimum 11-gauge with 3/8-inch diameter head.

G. Sheet Metal Flashing: Use materials specified in Division 7 Section “Sheet Metal Flashing and Trim”.

H. Aggregate Surfacing: ASTM D 1863, No. 6 or No. 67, clean, dry, opaque, water-worn gravel or crushed stone, free of sharp edges; 1/4-inch minimum to 3/4-inch maximum size.

I. Termination Bar: Hot-dipped galvanized steel; 1/8-inch x 1-inch bar stock, pre-drilled holes.

J. Expansion Joint Filler:

1. Flexible Vapor Retarder – Minimum 60 Mil thick vinyl sheet, or approved equal.
2. Compressible insulation – Fiberglass batt insulation, or approved equal.

K. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer or as indicated.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verify type/composition of existing roofing and base flashing membranes and bitumens and select appropriate repair materials that are compatible with existing materials scheduled to be repaired, unless otherwise indicated.

B. Protect existing membrane roofing system that is indicated not to be repaired.

1. Limit traffic and material storage to areas of existing roofing membrane that have been protected.
2. Maintain temporary protection and leave in place until roofing repair has been completed.

C. Repair or replace damaged or deteriorated deck substrates. Use appropriate patching materials that are compatible with existing substrates.

D. Coordinate with Owner to shut down air intake equipment in vicinity of Work. Cover air intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in ductwork.

E. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

F. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

1. If roof drains will be temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into, or under existing membrane roofing system components that are to remain.

G. Verify that rooftop utilities and service piping have been shut off before commencing Work.

3.2 ROOF REPAIR PROCEDURES

A. MEMBRANE REPAIRS (at designated areas)

1. Re-Flash Existing Curbs, Walls or Other Penetration:
   a. Clean and prepare surfaces to be re-flashed and remove all loose or un-bonded materials.
   b. Torch apply a polyester reinforced, smooth surfaced APP-modified asphalt sheet.
   c. Use PMMA auxiliary materials as specified.
   d. Apply unreinforced/reinforced PMMA coating as specified.

2. Repair Existing Edge Condition or Base Flashings:
   a. Clean and prepare surfaces to be re-flashed and remove all loose or un-bonded materials.
   b. Torch apply a polyester reinforced, smooth surfaced APP-modified asphalt sheet.
   c. Use PMMA auxiliary materials as specified.
   d. Apply unreinforced/reinforced PMMA coating as specified.

3. Patch Existing Multiply Roof System
   a. Clean and prepare surface to be patched and remove all loose or un-bonded materials.
   b. Make a smooth cut of the existing roof system membranes and insulation. Dispose of debris and remove all loose or un-bonded materials. Prepare substrate for mechanical attachment/adhesion of insulation assembly.
   c. If required, prime substrate with asphalt primer and torch apply a polyester reinforced, smooth surfaced APP-modified asphalt sheet.
   d. Use FM approved fasteners and plates/insulation adhesive designed to secure roof insulation to the substrate.
   e. Insulation base sheet is a torch applied polyester reinforced, smooth surfaced APP-modified asphalt sheet.
   f. Top layer is an unreinforced PMMA coating as specified. Use PMMA auxiliary materials to prepare substrate before top layer coating is applied.

3.3 INSULATION INSTALLATION

A. Comply with NRCA and Manufacturer's written instructions for installing roof insulation. Installation must be acceptable to inspecting agencies to resist uplift pressure calculated according to ASCE 7-10 with a safety factor of 2.0.

B. Install one lapped base-sheet course and mechanically fasten to substrate according to roofing system manufacturer's written instructions; lap edges 4-inches.

C. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes more than 45 degrees.

D. Install tapered insulation under area of roofing to conform to slopes indicated.

E. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4-inch with insulation.

1. Cut and fit insulation within 1/4-inch of nailers, projections, and penetrations.

F. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7-inches or more, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6-inches in each direction.

G. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

H. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

I. Apply no more insulation than can be sealed with membrane in same day.

J. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:

1. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

K. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type if required by manufacturer or set each layer of insulation in a bead-applied insulation adhesive.

1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof according to ASCE 7-10 with a safety factor of 2.0.
2. Set each subsequent layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

L. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints a minimum of 6-inchesin each direction from joints of insulation below. Loosely butt cover boards together. Tape joints if required by roofing system manufacturer.

M. Set cover boards in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining cover boards in place.

3.4 SHEET METAL REPAIR

1. Pitch Pan Fill:
   a. Insert dry sheathing paper or roofing felt to seal openings around penetrating items through deck or substrate.
   b. In pan 2-inches or deeper, install non-shrink grout to 1-inch from top of pan; allow to cure.
   c. Install non-cracking, low-volatile, one-part, trowel-grade, elastomeric roof mastic to top of pan at edges and tapered to crown in center around penetrating items to shed water; Tremco POLYroof LV.

3.5 TORCH APPLICATION SAFETY REQUIREMENTS

A. Maintain a fire watch during all torching applications and for a minimum of 2-hours after torch work is completed for day.

B. Maintain a minimum two (2) fire extinguishers of class and capacity required by local authority having jurisdiction, but not less than 20 pound capacity. Keep fire extinguishers within 25-feet of all torch activity. Provide multiple extinguishers if torching in more than one area.

C. Provide training on proper use of fire extinguishers to all personnel used on project.

D. Turn torches off when not actively in use. Do not place active or hot torches on any combustible materials or surfaces.

E. Remove torches and fuel sources from site at end of each day and when superintendent is not on premises.

F. Secure fuel sources on roof surface to prevent tipping or falling.

END OF SECTION 07 5910

SECTION 07 6200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Formed Products:
      a. Formed roof drainage sheet metal fabrications.
      b. Formed low-slope roof sheet metal fabrications.
      c. Formed equipment support flashing.
      d. Formed expansion-joint cover flashings.
      e. Miscellaneous sheet metal accessories.
      f. Sheet metal Soffit panels and accessories.
      g. Precast concrete splash blocks.

B. Related Sections:
   1. Division 06 Section "Roofing Carpentry" for wood nailers, curbs, and blocking.
   2. Division 07 Section “Roof Replacement Preparation” for removal procedures for existing materials.
   3. Division 07 Section Styrene-Butadiene-Styrene (SBS) Modified Bituminous Roofing" for installing sheet metal flashing and trim integral with membrane roofing.
   4. Division 22 Section “Common Work Results for Plumbing” for requirements for modifying, repairing, or replacing roof mounted plumbing, and piping.
   5. Division 22 Section “Common Work Results for HVAC” for requirements for modifying, repairing, or replacing roof mounted mechanical equipment.
   6. Division 26 Section “Common Work Results for Electrical” for requirements for modifying, repairing, or replacing roof mounted electrical conduit, fixtures, and 150equipment.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. A 153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware
   2. A 240 - Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
   3. A 653 - Steel Sheet, Zinc Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip process.
   4. A 666 - Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
   5. A 755 - Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
   6. A 792 - Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
   7. B 32B - Solder Metal.

8. B 749 - Lead and Lead Alloy Strip, Sheet, and Plate Products.
9. C 920 -Elastomeric Joint Sealants.
10. C 1311B - Solvent Release Sealants.
11. D 226 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
12. D 1187 - Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
13. D 4397 - Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
14. D 4586 - Asphalt Roof Cement, Asbestos-Free.
15. D 4601 - Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.

B. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

C. Sheet Metal and Air Conditioning Contractor's National Association (SMACNA): Architectural Sheet Metal Manual.

D. National Association of Architectural Metal Manufacturers (NAAMM): Metal Finishes Manual for Architectural and Metal Products

1.4 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies as indicated to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Edge Design: Fabricate and install parapet Copings that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist roof edge design pressure (P) as identified in ANSI/SPRI-ES-1, as calculated according to ASCE 7-10.
   a. Building Location: 1401 South Rangerville Road, Harlingen, Texas 78552
   b. Roof Surface Height: 15
   c. Exposure Category: **C**
   d. Occupancy Category: **II**
   e. Estimated Design Pressures (Note: The Wind Up-lift Pressures identified below were estimated using the MetalEra.com *Wind Calculator* application and are being provided as a courtesy solely for bidding purposes. It is the responsibility of the Contractor to verify the accuracy of these estimates and to provide systems that resist the loads required by the applicable Building Code. These estimates do not constitute "engineering" studies and the use of the information provided below does not relieve the Manufacturer or the Contractor from providing and installing code compliant systems.)
      1) Horizontal Design Pressure: **130** psf.
      2) Vertical Design Pressure: **130** psf.

C. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

D. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

E. Panel Performance Requirements: Provide panels, which have been manufactured, fabricated and installed to withstand structural and thermal movement, wind loading and weather exposure to maintain manufacturer's performance criteria without defects, damage, failure or infiltration of water.
   1. R-Panel:
      a. Air Infiltration: Maximum 0.11cfm/lf (0.061m³/hr/m) of seam at static pressure of ± 6.24 psf (0.30 kPa) when tested per ASTM E1680.
      b. Water Penetration: No uncontrolled water penetration through the panel joints at a static pressure of 12.0 psf (0.57 kPa) when tested in accordance with ASTM E1646.

F. Finish Performance Requirements:
   1. Color Change and Fade Resistance: No cracking, peeling, blistering or loss of adhesion when tested on accordance wit ASTM G23: Color change, after removal of surface deposits such as dirt or chalk, maximum 5 Δ Hunter units.
   2. Humidity Resistance: no blistering, peeling, or loss of adhesion after 2000 hours testing in accordance with ASTM D2247.

1.5 ACTION SUBMITTALS

A. Product List: Submit list of proposed Products and manufacturers, including all items specified in Part 2 – Products or otherwise required by the Work.

B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

C. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:
   1. Identification of material, thickness, weight, and finish for each item and location in Project.
   2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
   3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
   4. Details of termination points and assemblies, including fixed points.
   5. Details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
   6. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
   7. Details of special conditions.
   8. Details of connections to adjoining work.
   9. Detail formed flashing and trim at a scale of not less than 3 inches per 12 inches.

D. Samples for Initial Selection: For each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.

E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
   1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
   2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
   3. Accessories and Miscellaneous Materials: Full-size Sample.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified fabricator.

B. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.

C. Warranty: Sample of special warranty.

1.7 QUALITY ASSURANCE

A. General: Work of this Section to physically protect membrane roofing, base flashings, and expansion joints from damage that would permit water leakage to building interior.

B. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance, with three years minimum experience.

C. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

D. Preinstallation Conference: Conduct conference at Project site.
   1. Meet with Owner, Architect, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, unit skylights, and roof-mounted equipment.
   2. Review methods and procedures related to sheet metal flashing and trim.
   3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
   4. Review special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect sheet metal flashing.
   5. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.

B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.

C. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

D. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

1.9 COORDINATION

A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

B. Coordinate with demolition work and with work of other trades to ensure sufficient materials and manpower are available to completely replace and make watertight all roofing removed each day.

C. Limit removal of existing sheet metal components, to ensure new membrane installation can be made watertight by end of day.

D. Coordinate installation of flanged metal components, including gravel guards, pitch pans, and accessories to ensure strip-in with hot bitumen (where applicable) on same day they are installed.

E. Schedule work to avoid storage on, and traffic over finished work.

1.10 WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
      b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
      c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
   2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet Restricted flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755.
   1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653, G90 coating designation; structural quality.
   2. Aluminum-Zinc Alloy-Coated (Galvalume) Steel Sheet: ASTM A 792, Class AZ50 coating designation, Grade 40; structural quality.
   3. Surface: Smooth, flat.

C. Prepainted Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755.
   1. Aluminum-Zinc Alloy-Coated (Galvalume) Steel Sheet: ASTM A 792, Class AZ50 coating designation, Grade 40; structural quality.
   2. Surface: Smooth, flat.
   3. Exposed Coil-Coated Finish:
      a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
      b. Minimum Exposure Tests:
         1) Humidity Resistance: 2000 hours.
         2) Salt-Spray Resistance: 2000 hours.
   4. Color:
      a. As selected by Architect from manufacturer's full range.
   5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

D. Lead Sheet: ASTM B 749, Type L51121, copper-bearing lead sheet.

E. Metal Soffit Panel:
   1. Metal R-Panel:
      a. Profile: Major longitudinal ribs 1 ¼” (32mm) Deep, spaced 12” (305mm) on center; minor longitudinal ribs centered between major ribs spaced 4” (102mm) on center panel; normal-run where ribs protrude from panel plane, viewed from exterior, reverse-run where ribs recede from panel plane, viewed from exterior.
      b. Size: 36” (914 mm) cover width, lengths indicated on drawings.
      c. Material:
         1) Galvalume Sheet Steel conforming to ASTM A792; AZ50 coating for painted; 26-gauge sheet thickness
         2) Aluminum Sheet Conforming to ASTM B209; 26-gauge sheet thickness

d. Finish: Siliconized polyester color coat applied to sight-exposed face of sheet after pretreatment and priming in accordance with coating manufacturers' recommendations.
e. Color: Selected from full range of manufacturer's standard color.
f. Manufacturer:
1) McElroy Metals, Inc.
a) Contact: 1500 Hamilton Rd., Bossier City, LA 71111; Telephone: (800) 562-3576, (318) 747-8097; Fax (318) 747-8099; E-mail: Info@mcelroymetal.com; website: www.mcelroymetal.com.
b) Local Rep: Aaron Wood – 512-784-3355 – awood@kovacsgroup.net
2) An Approved Alternate

2.2 UNDERLAYMENT MATERIALS

A. Polyethylene Sheet: 6-mil- thick polyethylene sheet complying with ASTM D 4397.

B. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

C. Slip Sheet: Building paper, 3-lb/100 sq. ft. minimum, rosin sized.

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
2. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
3. Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Hot-dip galvanized steel according to ASTM A 153 or ASTM F 2329 or Series 300 stainless steel.
4. Rust-resistant and compatible with materials to be joined.
5. Length: As required for thickness of material to penetrate substrate 1/2-inch minimum.

C. Mechanical Fasteners for Sheet Metal to Substrate Anchorage:
1. Masonry: One-step, screw-type drive anchor (nailin); heat-treated, stress relieved, stainless steel pin; zinc jacketed; sized for intended application; minimum 1-1/4-inch length x 1/4-inch diameter; Hammer-Screw® manufactured by Powers Fasteners, Inc.

2. Wood Blocking: Hexagonal head screws, stainless steel, with neoprene rubber washers; jacket color to match pre-painted sheet metal.
3. Concrete: Same as masonry or other power actuated fasteners, suitable for application.

D. Roofing Nails: Stainless steel (for fastening into ACQ treated lumber), hot-dipped galvanized or non-ferrous type for fastening into non-treated lumber); with annular rings, size as required to suit application; minimum 11-gage with 3/8-inch diameter head.

E. Mechanical Fasteners for Sheet Metal to Metal Fabrications (Support Framing) Anchorage: Appropriate for purpose intended, size as required to suit application and achieve positive anchorage to substrate material.

F. Solder:
1. For Stainless Steel: ASTM B 32, Grade Sn60, with an acid flux of type recommended by stainless-steel sheet manufacturer.
2. For Lead: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.
3. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.

G. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

H. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; low modulus, as specified in Division 07 Section “Sealants (for Roofing)”; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

I. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

J. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

K. Penetration Seal System: ChemCurb™ System – Penetration Seals, manufactured by Chem Linc, Inc. 416 E. Ransom St., Kalamazoo, MI 49007, (880-826-1681).
1. Curb Components: Precast, polymer modified cement or structural urethane.
2. Curb Adhesive: Special silicone sealant – DURALINK™.
3. Pourable Sealant: Two-component urethane.

L. Splash Blocks: Precast concrete of size and profile indicated; minimum 3000 psi at 28 days, with minimum 5 percent air entrainment; suitable for downspouts discharging at grade level or onto roof surface.

M. Sub-Girts: Rigid Furring Channels (Hat Shape): ASTM C645

2.4 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to

design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
   1. Obtain field measurements for accurate fit before shop fabrication.

C. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
   1. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

D. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

E. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.

F. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1-inch deep, filled with elastomeric sealant concealed within joints.
   1. Fabricate all components with allowance for expansion at joints. Provide enlarged or oval holes at all piercing fasteners.

G. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.

H. Form all sheet metal components (except corners) in longest practical length up to 10-feet maximum; true to shape, square, accurate in size, and free from distortion or defects detrimental to appearance or performance.

I. Fabricate corners on all sheet metal components (gravel guards, copings, cap flashings, etc.) to form one piece with minimum 18-inch and maximum 36-inch long legs.

J. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
   1. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" for application, but not less than thickness of metal being secured.

K. Soldered Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

L. Unsoldered Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

M. Hem exposed edges of metal 1/2-inch; miter and seam corners.

N. Fabricate vertical faces with bottom edge formed outward 3/4-inch at 30 degrees and hemmed to form drip.
   1. Where vertical height exceeds 8-inches, fabricate with stiffing grooves in accordance with SMACNA, unless specifically approved otherwise.

O. Form all sheet metal material to provide watertight joints:
   1. Unprotected Horizontal Surfaces (expansion joint covers, etc.): Standing seam or drive cleat joints.
   2. Vertical Surfaces (copings, cap flashings, gravel guards, etc.): Flat lock or cover and backer plate seams.

P. Miter all sheet metal corners and solder, weld, or fasten and seal all joints watertight:
   1. Prepainted metallic-coated steel sheet: Apply minimum 1/4-inch bead of sealant between connecting metal flanges and drill and fasten with rivets at 2-inches o.c.
   2. Stainless Steel: Solder joints watertight.
   3. Unfinished Galvanized Steel: Solder joints watertight.
   4. After soldering, remove flux. Wipe and wash solder joints clean.
   5. Install sealant so it will not be visible on outside of joints.

Q. Fabricate elements complete with required connection pieces.

R. Fabricate all components with horizontal (flat) surfaces with built-in slope for drainage toward roof unless indicated otherwise.

S. Do not use graphite pencils to mark metal surfaces.

2.5 ROOF DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.
   1. Gutter Style: SMACNA designation A.
      a. Size: Designed to meet roof drainage area, rainfall intensity criteria, and downspout size and spacing.
      b. Supports: Minimum 1/8-inch x 1-inch Brackets and 0.1046 inch (12 gage) spacers at maximum 36-inches oc, staggered.
      c. Join sections with riveted and sealed or soldered joints.
   2. Expansion Joints: Lap type.
      a. Spacing: Minimum twenty (20) feet, maximum fifty (50) feet between expansion joints.
   3. Accessories: Wire ball downspout strainer.
   4. Gutters with Girth up to 6-Inches: Fabricate from the following materials:
      a. Prepainted Metallic-Coated Steel: 0.022 inch (24-gage) thick.
   5. Gutters with Girth 6-15 Inches: Fabricate from the following materials:
      a. Prepainted Metallic-Coated Steel: 0.028 inch (22-gage) thick.

B. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
   1. Fabricated Hanger Style: SMACNA figure designation 1-35A.
   2. Size: Designed to accept roof drainage area, rainfall intensity criteria, and downspout spacing.
   3. Length: Minimum twenty (20) feet or required height, maximum fifty feet between expansion joints.
   4. Joints: Sections with riveted and sealed or soldered joints.
   5. Supports: 12 Gage straps at maximum 5-feet oc. All strap edges rolled or smooth.
   6. Fabricate from the following materials:
      a. Prepainted Metallic-Coated Steel: 0.0217 inch (24-gage) thick.

C. Fabricate gutter and downspout accessories seal watertight.

D. Collector Box: Fabricate to cross section indicated, to drain into 4x4 Tube Steel downspouts. Fabricate in accordance with SMACNA in gauge as per drawings, but no less than recommended by SMACNA.
      a. Prepainted Metallic-Coated Steel: 0.028 inch (22-gage) thick.

E. Roof-Edge Flashing (Gravel Stop): Fabricate in minimum 96-inch- long, but not exceeding 10-foot- long, sections. Furnish with 6-inch- wide, joint cover plates.
   1. Joint Style: Butt, with 12-inch- wide concealed backup plate and 6-inch- wide exposed cover plates.
   2. Fabricate with scuppers spaced at existing locations or where indicated on the roof plan, of dimensions required with 4-inch- wide flanges and base extending 4-inches beyond cant or tapered strip into field of roof. Fasten gravel guard angles to base of scupper.
   3. Fabricate roof edge flashing from the following material:
      a. Prepainted Metallic-Coated Steel: 0.022 inch (24-gage) thick.
   4. Fabricate roof edge cleats from the following material:
      a. Metallic Coated (Galvanized or Galvalume) Steel: 0.028 inch (22-gage) thick.

F. Roof and Roof to Wall Transition; Roof to Roof Edge Flashing (Gravel Stop) Transition; and Expansion-Joint Cover: Fabricate from the following materials:
   1. Prepainted Metallic-Coated Galvalume Steel: 0.022 inch (24-gage) thick.

G. Counterflashing: Fabricate from the following materials:
   1. Prepainted Metallic-Coated Galvalume Steel: 0.022 inch (24-gage) thick.

H. Flashing Receivers: Fabricate from the following materials:
   1. Stainless Steel: 0.019 inch (26-gage) thick.

I. Roof-Penetration Flashing: Fabricate from the following materials:
   1. Stainless Steel: 0.019 inch (26-gage) thick.

J. Soil Pipe Flashing: Fabricate from the following material:
   1. Lead: 4.0 lb/sq. ft., hard tempered.

2.6 MISCELLANEOUS SHEET METAL FABRICATIONS

A. Equipment Support Flashing: Fabricate from the following materials:
   1. Prepainted Metallic Coated Galvalume Steel: 0.028 inch (22-gage) thick.

2.7 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Exposed to View (Unfinished) Galvanized Steel Components: Paint to match prepainted metallic-coated steel prior to installation:
   1. Clean: Comply with SSPC-1 - Solvent Wipe.
   2. Primer: Apply specified or finish paint manufacturer's recommended primer in accordance with manufacturer's instructions.
   3. Finish Coat: Apply powder coating or approved urethane enamel in accordance with manufacturer's instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.
   1. Verify compliance with requirements for installation tolerances of substrates.
   2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
   3. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets in place, and nailing strips located.
   4. Verify membrane termination and base flashings are in place, sealed, and secure.

B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. General: Install underlayment as recommended by SMACNA and as indicated on Drawings.

B. Polyethylene Sheet: Install polyethylene sheet with adhesive for anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped and taped joints of not less than 2 inches.

C. Felt Underlayment: Install felt underlayment with adhesive for temporary anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

3.3 INSTALLATION, GENERAL

A. Field measure site conditions prior to fabricating work.

B. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
   1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
   2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
   3. Provide continuous cleats fastened not more than 12-inches on center. Anchor cleats with a minimum two fasteners.
   4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
   5. Install sealant tape where indicated.
   6. Torch cutting of sheet metal flashing and trim is not permitted.
   7. Do not use graphite pencils to mark metal surfaces.

C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
   1. Coat back side of stainless-steel and lead sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
      a. Minimum Dry Film Thickness: 15-mils.
   2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.
   3. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.

D. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10-feet. Provide joints within 18- to 36-inches of all corners or intersections. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1-inch deep, filled with elastomeric sealant concealed within joints.

E. Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws; and metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance:
   1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
   2. Stainless Steel: Use stainless-steel fasteners.

F. Seal joints as shown and as required with elastomeric sealant for watertight construction.
   1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1-inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
   2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants (for Roofing)."

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches except reduce pre-tinning where pre-tinned surface would show in completed Work.
   1. Do not solder pre-painted metallic-coated steel sheet.
   2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
   3. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

H. Rivets: Rivet joints where indicated and where necessary for strength.

I. Protect all membrane penetrations as indicated and as recommended in SMACNA and NRCA manuals.

3.4 ROOF DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with elastomeric sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets and straps spaced not more than 36 inches apart. Provide end closures and seal watertight with sealant. Slope to downspouts.
   1. Fasten gutter spacers to front and back of gutter.
   2. Loosely lock straps to front gutter bead and anchor to roof deck.
   3. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24-inches apart.

4. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet apart. Install expansion-joint caps.

C. Downspouts: Join sections with 1-1/2-inch telescoping joints.
1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c. in between.
2. Connect downspouts to underground drainage system where available.
3. Provide opening at base of downspout (As detailed in the Drawings) to direct water away from building.
4. Set splash blocks under downspouts not connected to underground drainage system.

D. Splash Blocks: Install where downspouts discharge on low-slope roofs or onto grade.
1. Roof Discharge: Set on traffic pads compatible with roofing membrane.
2. Grade Discharge: Set on a bed of compacted fill.

E. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated in drawings. If not indicated in Drawings, located expansion joints no greater than 50’ apart in any Gutter Section. Locate 2 downspouts for each 50’ section of gutter (min.). Lap joints a minimum of 4-inches in direction of water flow.

3.5 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
1. Install starter and edge strips, and cleats before starting installation.
2. Strip in all sheet metal flanges the same day they are installed.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces specified in Part 1 and as indicated.
1. Backer Plates: Secure with fasteners suitable for substrate, 6-inches o.c. each face.
2. Interlock bottom edge of roof edge flashing with continuous cleats anchored to substrate at 12-inch centers.
3. Apply 1/4-inch bead of sealant between each layer of metal at each edge.
4. Cover Plates: Hook front or exposed face of cover plate over drip edge.
5. Do not use mastic between sheet metal components.

C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4-inches over base flashing. Install stainless-steel draw band and tighten.

D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4-inches over base flashing. Lap counterflashing joints a minimum of 4-inches and bed with elastomeric sealant.

1. Sawcut new reglets where required.
   a. Provide bayonet style lap joints, minimum 4-inch overlap.
   b. Fill voids between wedges with backer rod.
   c. Seal receiver to vertical face of wall.
2. Secure in a waterproof manner by means of snap-in installation and sealant or plastic wedges and sealant.
3. Install surface mounted reglets true to lines and levels.
   a. Seal top of reglets with sealant.
   b. Secure in place with neoprene head screws at maximum 12-inches on center.

E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:
1. Install lead flashings at all soil pipe penetrations. Turn lead flashing down inside piping, being careful not to block vent piping with flashing.
2. Provide Penetration Seal System at all small penetrations not otherwise detailed.
   a. Clean roof surfaces to receive Penetration Seal Systems.
   b. Clean pipes and penetrating elements to remove plastic cement, bitumen, and other contaminants by wire brushing and scraping.
   c. Caulk around penetrating elements with curb adhesive.
   d. Apply beads of curb adhesive to flat side of first precast curb component. Place caulked curb onto roof surface to form half circle around penetrating element.
   e. Apply beads of curb adhesive to flat side and to scarf joints of second precast curb component. Place second section of curb onto roof surface to form circle with first section. Press scarf joints together firmly and press both sections down.
   f. Apply continuous bead of curb adhesive around outside edge of curb at roof.
   g. Fill around penetrating element with pourable sealant to top of curb.
3. **Pitch pans are not desired**. Install only where specifically indicated, or approved by Architect. Provide flanged umbrellas at all pitch pans.
   a. Fill with non-shrink grout to 1-inch from top of flange.
   b. Top with Pitch Pan Filler - Sealant Type ES-2.
4. Seal with elastomeric sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.

F. Protect all membrane penetrations as indicated and as recommended in SMACNA and NRCA manuals.

3.6 MISCELLANEOUS FLASHING INSTALLATION

A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.7 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.8 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

3.9 SCHEDULE - MATERIALS

A. Exposed to View Components:
   1. One-Piece Flashing and Expansion Joint Terminations: Metallic coated steel sheet, powder coated to match adjacent prepainted metallic-coated steel sheet components.
   2. All Other Components: Metallic coated steel sheet, powder coated to match adjacent prepainted metallic-coated steel sheet components.

B. Concealed from View Components, (Counterflashings, Expansion Joint Covers, Etc.): Stainless steel sheet.

C. Roof Penetration Flashings: Stainless steel sheet.

D. Rain Hoods and Umbrellas: Stainless steel sheet.

END OF SECTION 07 6200

CERTIFICATION OF AUTHORIZED FABRICATOR
For
Shop-Fabricated Edge Metal Flashings
As Tested By

NATIONAL

ES TESTING SERVICE, INC.

Instructions: Please complete and return the following information for each sheet metal fabrication shop location (e.g., shops at different addresses) to be included in your company's authorized certification of tested products per ANSI/SPRI ES-1 2003 guidelines.

FAX BACK TO: 866-298-6767

Primary Contact Person: _____

Title (Primary Contact): _____

Company Name: _____

Company Address: _____

_____

City, State, ZIP: _____

Telephone: _____

FAX: _____

Website: _____

E-Mail (Primary Contact): _____

Equipment List (All Equipment Used To Fabricate Submitted Details):

_____

_____

_____

_____

_____

NATIONAL
ES TESTING SERVICE, INC.

Authorized Fabricator Agreement

Enabling Shop Fabricated Products to be Compliant to the Guidelines of ANSI/SPRI ES-1 2003/2007

This agreement is made the _____day of _____, 200___ by and between National ES Testing Service, Inc. (NESTS) 312 Penwood Trail, Dacula, Georgia 30019 and:

Company Name: _____
(Hereinafter "Authorized Fabricator")

Address: _____

City, State, ZIP: _____

Phone Number: _____

SAMPLE

NESTS has developed a purpose built ANSI/SPRI ES-1 Test Apparatus in strict accordance to the guidelines of the Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems approved December 11,2003, for the purpose of testing wind resistance of specific shop fabricated, metal roof edge flashing, fascias and coping systems. NESTS's tests performed on behalf of the Authorized Fabricator signifies specific shop fabricated metal roof edge flashing, fascias and coping systems fabricated and installed in accordance with the Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems are in compliance with ANSI/SPRI ES-1 for the specific loads indicated as listed in the Certificate of Compliance document.

Now therefore, and in consideration of the mutual covenants herein expressed and other lawful valuable consideration, the parties hereto agree as follows:

1. NESTS agrees to:provide the Authorized Fabricator with one copy of each tested product's Certificate of Compliance and the accompanying test data in Microsoft Excel 2003 format;provide the Authorized Fabricator a one (1) year Certificate of Compliance from the date of full payment of testing services

performed, renewable for additional one (1) year periods following the periodic follow-up audit performed at the authorized fabricator's facilities by NESTS, and payment in full for this yearly audit.

2. The Authorized Fabricator agrees to:Maintain in good condition all equipment used and as listed on the Certification of Authorized Fabricator Form for the fabrication of compliant details as tested on the date listed on the individual Certificate of Compliance form(s).

Pay a non-refundable $2500.00 fee for each tested detail, material composition and size, for test services rendered on behalf of the Authorized Fabricator. The Authorized Fabricator must furnish NESTS with full scale, complete representations of each detail to be tested, in the exact condition said details would be supplied for installation to Authorized Fabricator's customer(s). The cost of supplying these details and the associated freight charges are the full responsibility of the Authorized Fabricator. A 50% down payment must be received prior to the commencement of all testing. Final payment must be received In-Full prior to the issuance of the Certificate of Compliance(s) to the Authorized Fabricator. Furthermore, the Authorized Fabricator agrees to pay an annual Authorized Fabricator Fee of $750.00 plus the actual travel costs (+ 15%) for issuance of an additional one (1) year Certificate of Compliance for all details as tested on the date of the original issuance.

Maintain an accurate record of all edge metal flashings, fascias and coping system configurations fabricated by the Authorized Fabricator for which certification applies. This record shall include the project name, building owner(s) names, addresses and phone number(s), location and date of substantial completion, the installing contractor(s) name, address and phone number(s), specific configurations installed, metal type and the total lineal footage fabricated of all components to the certified details. A copy of this record shall be made available to NESTS upon NESTS's request.

Hold NESTS harmless and to defend and indemnify NESTS against any and all liability, loss, expense or damage from claims, demands, court costs (including legal fees), or for judgments arising out of any negligent or intentional acts of the Authorized Fabricator or third parties relating to the use of the listed products on the Certificate of Compliance, or arising from the use of this Certificate of Compliance.

NESTS will not, under any circumstances, be held liable to the Authorized Fabricator for any damages, including indirect, special, punitive or consequential damages, or any third party claims which may arise as a result of NESTS allowing the Authorized Fabricator to use the Certificate(s) of Compliance as provided for in this authorized fabricator agreement. The maximum aggregate liability of NESTS for

SAMPLE

damages in connection with the use of this listing and this authorized fabricator agreement shall not exceed the annual listing fee of $750.00 paid to NESTS by the Authorized Fabricator.

3. Any other charges and fees associated with the Certificate of Compliance issued by NESTS that may come up now or in the future to remain compliant with the current ANSI/SPRI ES-1 document, will be the sole responsibility of the Authorized Fabricator, and paid prior to any continuation or issuance further certifications.
4. In the event NESTS detects or is made aware (by any means) of any deviation or variance from this authorized fabricator agreement, or improper or unauthorized use of the NESTS Certificate of Compliance, and upon written notice to the Authorized Fabricator, NESTS reserves the right to terminate this authorized fabricator agreement.
5. If NESTS is served with a subpoena, court order or other similar document requesting disclosure of information relating to the Certificate of Compliance or this authorized fabricator agreement, NESTS will promptly notify the Authorized Fabricator. In the event the Authorized Fabricator chooses to contest the request, NESTS will attempt to cooperate with the Authorized Fabricator. The responsibility for contesting the request including all court costs, attorneys' fees, travel costs or any and all related costs shall rest solely with the Authorized Fabricator. Any costs incurred by NESTS in responding to a request will be invoiced by NESTS to the Authorized Fabricator and shall be deemed due upon receipt.
6. The rights extended to the Authorized Fabricator under this authorized fabricator agreement may not be subcontracted to, transferred to, assigned to or acquired by any other person or entity without NESTS's prior written authorization.
7. This authorized fabricator agreement can be terminated by either NESTS or the Authorized Fabricator upon not less than thirty (30) days written notice to the other party. Such notice shall designate a termination date and the notice period shall be deemed to commence upon the date of mailing of the notice to the other party by registered or certified mail, return receipt requested.
8. The authorized fabricator agreement shall continue to be in effect for a period of one (1) year from the date first written above. It shall be subject to automatic renewal thereafter for a period of one year, and the subsequent year renewal fee in-full becomes due thirty (30) days prior to the renewal date, or is subject to immediate cancellation. Automatic renewal will occur unless terminated by NESTS or the Authorized Fabricator.

SAMPLE

This agreement is accepted by:

National ES Testing Service, Inc.
Tim Tunney
President

SAMPLE

Date

Company Name:

Signature of Officer of Authorized Fabricator

Date

NATIONAL

ES Testing Service, Inc.

"The Right Choice for Your Roof"

Certificate of ANSI/SPRI ES-1 Compliance

National ES Testing Service, Inc. hereby certifies that the Product(s) listed below have been tested in accordance with the protocols of the ANSI/SPRI ES-1 Roof Edge Standard, and when installed as required will withstand the Design Pressures as calculated using ES-1 for the below listed project, and as prescribed by Section 1504.5 of the 2003 and 2006 International Building Code.

Product(s) Certified:
Building Location:
Architect:
Building Owner:
Completion Date:
Installing Contractor:
Material Tested:

Certificate Number:

Sample

Dated _____

Authorized Signature for National ES Testing Service, Inc: _____

Disclaimer

All basic wind speed velocities and velocity pressure calculations are based on the maps and formulas provided in the document "ANSI/SPRI ES-1 2003 "Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems" and the SEI/ASCE 7-02 standard. Although every care has been taken to ensure that the information based on state and county is accurate according to the standards, official wind speed requirements can vary based on local and county jurisdiction. It is highly recommended that any information regarding wind speed velocity provided be verified with local and county officials before any action is taken. No liability is accepted or implied by National ES Testing Service, Inc. for such information and advice.

National ES Testing Service, Inc. • P.O. Box 485 • Decula, GA 30019
O: 404-234-3905 • Fax: 866-648-0692 • www.nationalestesting.com

January 31, 2008

National ES Testing Service, Inc.
Mr. Tim Tunney
PO Box 485
312 Penwood Trail
Dacula, Ga. 30019

Subject: ANSI/SPRI ES-1 Test Equipment

This is to confirm that Underwriters Laboratories, Inc. has witnessed and completed an ANSI/SPRI ES-1 Test series utilizing the equipment designed and provided by National ES Testing Services, Inc.

The observed test equipment was controlled by a proprietary software program and fully programmable Windows based computer of which controls pneumatically driven loading rams both horizontally and vertically to apply uniform loading spaced 12-in OC across the centerline of the particular perimeter edge flashing system under review. For copings products, the equipment provides simultaneous loading spaced 12-in OC across the centerline of both the top of the coping and to one of the faces of the test specimen. The testing was then repeated with the opposite face of the coping. Independent "scales", separate from the operating program of the test machine, were utilized to verify and record the specific pound per square foot (psf) applied at each incremental load scheduled during the applicable ES-1 test being performed either horizontally, vertically, or simultaneously horizontally and vertically.

Based on Underwriter Laboratories observations, it was determined that the loading capability of the National ES Testing Service, Inc. machine complied with the loading applications stated, and as required in the 2003 ANSI/SPRI ES-1 Standard. The loading equipment was also capable of the loading applications included in the proposed 2007 revisions to the ANSI/SPRI ES-1 Standard that are still under the American National Standards Institute review process.

UL offers Data Acceptance Programs whereby test work conducted by third-party test facilities is used to facilitate the conduct of investigations of products. When data is to be used for this purpose, under our Witness Test Data Program (WTDP), the facilities must be found to be in accordance with national and international accreditation criteria. For additional information on UL's Data Acceptance Programs, please access www.UL.com/dap.

If you should have additional questions, please feel free to contact us.

Very truly yours

Kenneth Rhodes
Senior Staff Engineer
Fire Protection Div.

Reviewed by

Dwayne Sloan
Primary Designated Engineer
Fire Protection Div.

Underwriters Laboratories Inc.
333 Pfingsten Road, Northbrook, IL 60062-2096 USA
T:: 847.272.8800 / F:: 847.272.8129 / W:: ul.com

SECTION 07 9200 – ROOFING AND WALL SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Urethane joint sealants.

B. Related Sections:
1. Division 07 Sections "SBS Modified Bituminous Membrane Roofing" for application and locations for sealants used in conjunction with roofing.
2. Division 07 Section "Sheet Metal Flashing and Trim" for sealants used in conjunction with metal flashing for roofing.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. C 920 - Elastomeric Joint Sealants
2. D 1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.

1.4 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.5 ACTION SUBMITTALS

A. Product List: Submit list of proposed Products and manufacturers, including all items specified in Part 2 – Products or otherwise required by the Work.

B. Product Data: For each selected joint-sealant product indicated, indicating sealant chemical characteristics, performance criteria, preparation, limitations, colors available, and Material Safety Data Sheets (MSDS).

C. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

D. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch wide joints formed between two 6-inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

E. Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.6 INFORMATIONAL SUBMITTALS

A. Manufacturer's Installation Instructions: Include substrate preparation requirements, special precautions and installation temperature range.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

C. Preinstallation Conference: Conduct conference at Project site.

1.8 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 URETHANE JOINT SEALANTS

A. Single-Component, Nonsag, Urethane Joint Sealant – ES-1: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.
1. Products: Subject to compliance with requirements, provide one of the following:
a. BASF Building Systems; Sonolastic Ultra.
b. Pecora Corporation; Dynatrol I-XL.
c. Sika Corporation, Construction Products Division; Sikaflex - 1a.
d. Tremco Incorporated; Vulkem 116.

B. Single-Component, Pourable, Traffic-Grade, Urethane Joint Sealant – ES-2: ASTM C 920, Type S, Grade P, Class 25, for Use T.
1. Products: Subject to compliance with requirements, provide one of the following:
a. BASF Building Systems; Sonolastic SL 1.
b. Bostik, Inc.; Chem-Calk 950.
c. Pecora Corporation; Urexpan NR-201.

d. Sika Corporation. Construction Products Division; Sikaflex - 1CSL.
e. Tremco Incorporated; Vulkem 45.

2.3 SILICONE JOINT SEALANTS

A. Single-Component, Non-Staining, Low Dirt Pick-Up, Low Modulus, Silicone Sealant – ES-3: ASTM C 920, Type S, Grade NS, Class 50, for Use NT, M, G, A & O.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Tremco Incorporated; Spectrem® 3

2.4 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective

coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
   a. Concrete.
   b. Masonry.
   c. Exterior insulation and finish systems.
3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
   a. Metal.
   b. Glass.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.

3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
   a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application JS-1:
1. Joint Locations: Exterior joints in vertical surfaces and horizontal non-traffic surfaces:
   a. Joints in flashing and sheet metal components.
   b. Joints between different materials not listed above.
2. Joint Sealant: Single-component nonsag urethane sealant ES-1.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors, to match sheet metal, paint and masonry colors.

B. Joint-Sealant Application JS-2: Pitch Pan Filler.
1. Joint Sealant: Single-component urethane sealant ES-2.
2. Joint-Sealant Color: Black.

C. Joint-Sealant Application JS-3:
1. Joint Locations: Exterior joints in vertical surfaces and horizontal non-traffic surfaces:
   a. Joints between Concrete, Concrete Masonry and Clay Masonry.
2. Joint Sealant: Single-component nonsag silicone sealant ES-3.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors, to match concrete and masonry colors.

END OF SECTION 07 9200

SECTION 09 9113 – PAINTING

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Surface preparation, priming and painting of the following elements of work:
   1. New and existing gas piping and apparatuses.
   2. Surface preparation and priming of existing metal decking per division 07 Section "Roof Replacement and Deck Repair". This work shall occur as part of Unit pricing.
   3. New galvanized steel fabrications (where noted).
   4. Existing roof scuttle hatches (where noted).

B. Field painting: Not required on items specified completely finished at the factory, or on aluminum, pre-finished sheet metal, copper, brass, bronze, stainless steel or other non-ferrous metal. Do not paint over UL or FM labels.

C. Prime coats specified herein will not be required on items delivered with primer or shop coats already applied; however, touch-up shall be required prior to final coats.

D. Extra materials: Deliver to owner, a 1-gal. (3.8-L) container, properly labeled and sealed, of each color and type of primer and finish coat paint used on Project.

1.2 RELATED REQUIREMENTS

A. General Conditions, Supplementary General Conditions, Forms, Specification Sections Found in Division 01 through Division 26, and all Drawings apply to Work Specified in this section.

1.3 RELATED SECTIONS

A. Division 07 Section – Roof Removal and Deck Repair

B. Division 23 Section – Roof-Related Mechanical Provisions

1.4 Submittals

A. Submit Manufacturer's literature and letters attesting tat the products used meet or exceed these specifications. Submittals shall indicate flame spread rating of all paint products proposed for use in accordance with ASTM E-84.

1.5 QUALITY ASSURANCE

A. Supplier and Contractor: Firms of long term operation, technically proficient and experienced in the trade.

B. Primers and undercoats: From same manufacturer and finished coats.

C. All paint shall be of the kind and brands hereinafter specified, or of a prior approved equal. All painting materials shall be of the highest quality and have identifying labels on the containers.

1.6 PRODUCT HANDLING, STORAGE, AND DELIVERY

A. Deliver paint to the site in manufacturer's sealed containers. Minimum contents of each manufacturer's label on each container. Manufacturer's' name, type of paint, color of paint, and instructions for reducing. Thinning may be done only in accordance with directions given on the container. Job mixing or job tinting man be done only when approved by the Architect. Mixing or thinning operations will not be conducted in the interior or on the roof of any existing building on the site.

B. Store paint and other combustible materials to protect from the possibility of fire. Store paint in areas where spillage can be reduced and confined and not damage Work already in place. Do note store paint or other combustible material in the interior of any existing building on the site.

1.7 JOB CONDITIONS

A. Full coverage will be required for the application specified. Apply additional coats if required to produce full coverage.

B. Make each coat slightly darker than the preceding coat, unless otherwise directed.

C. Where new Work adjoins existing painted surfaces, match existing color and carry new painting to an appropriate stopping point along the existing painted surface. The stopping point will be approved by the Architect.

1.8 WARRANTY

A. Provide two-year Warranty for workmanship and materials utilized in performance of work by contract and subcontractor.

PART 2 - PRODUCTS

2.1 SCHEDULE OF PAINTING

A. Unless otherwise noted, all paints specified are either products of Sherwin-Williams, or approved equal; no other manufacturers are permitted, unless the specified paint becomes unavailable. The kinds of paint and number of coats required on the various surfaces shall be as follows:

B. <u>Exterior Gas Piping</u>
   1. Existing Exterior Gas Piping
      a. Surface Preparation: SSPC-SP2 (for Iron & Steel). Spot treat areas that are rusted with Rust Inhibiting Primer.
      b. 1st Coat: Kem Bond Primer (3.5mils dft)
      c. 2nd Coat: Pro Industrial Acrylic – Semi-gloss (3.3 mils dft)
      d. 3rd Coat: Pro Industrial Acrylic – Semi-gloss (3.3 mils dft)

C. <u>Existing Metal Decking – (With Surface Corrosion)</u>
   1. Existing Metal Decking (With Surface Corrosion) as per unit pricing.
      a. Surface Preparation: Remove all oil, grease, salt or water-soluble chemicals with suitable cleaner and remove cleaner residue with a damp, clean cloth. Remove Blistered and loose paint, loose rust scale and heavy rust buildup. (Note: Do not remove all rush. Best results are achieved when all rusted areas are exposed and a thin layer of rust is left on the surface.

b. 1st Coat: "1 step Rush Converter" by interstate Products, Inc., 3921 Sawyer Rd., Sarasota FL 34233, (800) 474-7294, Fax: (800) 448-6329, http://store.interstateproducts.com/products/Rust_Converter. Apply As per manufacturer's written recommendations.

D. New Galvanized Steel Fabrications
1. New Galvanized Steel Fabrications
a. Surface Preparation: SSPC-SP1 (for galvanizing)
b. 1st Coat: Pro Industrial Acrylic – Semi-gloss (3.3 mils dft)
c. 2nd Coat: Pro Industrial Acrylic – Semi-gloss (3.3 mils dft)

E. Exterior Metal
1. Existing Hollow Metal Door Frames and Trim, and Roof Scuttle Hatches
a. Surface Preparation: SSPC-SP2 (for Iron & Steel). Spot Treat Areas that are rusted with Rust Inhibiting Primer.
b. 1st Coat: Kem Bond HS Primer (3.5 mils dft)
c. 2nd Coat: Pro Industrial Acrylic – Semi-gloss (3.3 mils dft)
d. 2nd Coat: Pro Industrial Acrylic – Semi-gloss (3.3 mils dft)

PART 3 - EXECUTION

3.1 INSPECTION

A. Review the surfaces to be painted and coordinate with the responsible subcontractor to assure correctness of the surfaces. Report painting – related problems to Architect.

B. Proceeding with the installation of painting shall be construed as evidence of acceptance of the conditions under which painting work will be accomplished

3.2 PREPARATION

A. Protect by drop cloth or other measures all interior floor and wall surfaces as well as exterior roof and wall surfaces against overspray and paint drippage. Immediately clean any spillage or overspray.

B. Remove oils, grease, rust, scale and dust and touch-up any pitted or abraded places on items that have been shop coated. Where steel and iron have heavy coating of scale or are coated with asphalt or other bituminous materials, removed such materials by wire-brushing or sandblasting if necessary to produce a satisfactory surface for painting.

C. Before painting, remove hardware, accessories, plates, light fixtures, and similar items, or provide ample protection of such items. Upon completion of each area, replace above items in working order. When necessary disconnect convector covers to permit painting of surfaces behind them; replace and re-connect upon completion. Use only skilled mechanics for removal and connection items.

3.3 PAINTING APPLICATION

A. Do not apply exterior paint of coatings in damp, rainy weather, or until the surface has been thoroughly dried from the effects of such weather. Do not paint when the temperature is below 50 degrees Fahrenheit.

B. Ensure surfaces to be painted are clean, dry, smooth, and protected from dampness.

C. Ensure each coat of paint is well-brushed on, worked out evenly and allows to dry as required in accordance with the manufacturer's written recommendations before subsequent coats are applied.

D. Provide finish work that is uniform, and of approved color, smooth and free from runs, sags, defective brushing, clogging or excessive flooding. Make edges of paint adjoining other materials of colors sharp and clean by overlapping.

3.4 WARRANTY

A. Guarantee all work performed under this contract for a period of one (1) years from the date of substantial completion against all defects in materials and workmanship. Defective work includes cracking, peeling, scaling of paint, water absorption or rusting.

END OF SECTION 09 9133

SECTION 22 0500 – COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Common Work Results for Plumbing specifically applicable to Division 22 Work, in addition to Division 01 - General Requirements.
2. Installation of primary and overflow roof drains and associated piping.
3. Lifting, moving, re-installation, and minor modifications to existing plumbing and piping for roof drains, soil pipes, and vents; and equipment piping, drain lines, service lines, and connections.
4. Anchors, brackets, fasteners, hardware, and accessories for related Work.

B. Related Requirements:
1. Section 07 5216 “Styrene-Butadiene-Styrene (SBS) Modified Bitumen Membrane Roofing” for installation of roof penetration flashings.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Existing, modified, or replaced plumbing, piping, connections, and equipment shall withstand required pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, modification, or other defects in construction. Plumbing and piping shall remain watertight.

1.4 ALLOWANCES

A. Cash Allowance: Refer to Division 01 Section “Allowances” for allowance sum applicable to Work.

1.5 UNIT PRICES

A. Refer to Division 01 Section "Unit Prices" for description of Work in this Section affected by unit prices.

B. Installation of Roof Drain and Associated Piping:
1. Basis of Measurement: By each drain.
2. Basis of Payment: Includes roof drain assembly and linear feet of drain piping listed in Section 00 0410 Document “Proposal, Alternates & Unit Prices Form” with insulation and covering, including all necessary hangers, supports, and hardware; and testing of piping prior to installation of insulation and protective covering.

1.6 ACTION SUBMITTALS

A. Product List: Submit list of proposed Products and manufacturers, including all items specified in Part 2 – Products or otherwise required by the Work.

B. Product Data: For each type of product required. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

C. Shop Drawings: For required modifications. Include plans, elevations, sections, details, and attachments to other work.

D. Provide layout of affected piping, including:
   1. Riser diagrams.
   2. Hanger diagrams indicating proposed attachment and locations.
   3. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1.7 INFORMATIONAL SUBMITTALS

A. Samples: For each exposed product and for each color and texture specified.

B. Schedule: List each area of work and all systems or equipment affected. Indicate proposed time of disconnection, re-connection, and duration for shutdowns.

C. Qualification Data: For qualified Installer, Applicator, manufacturer, fabricator, Professional Engineer, testing agency, factory-authorized service representative.

1.8 CLOSEOUT SUBMITTALS

A. Welding certificates.

B. Maintenance Data: For products and materials to include in maintenance manuals.

C. Operation and Maintenance Data: For systems, subsystems, or equipment to include in emergency, operation, and maintenance manuals.

1.9 QUALIFICATIONS

A. Installer: Company specializing in installing the work of this Division with a minimum of five (5) years documented experience working with the systems and Products in place and proposed or required. Licensed by jurisdictions having authority to perform the required work.

B. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation of units required for this Project.

C. Plumbing: Conform to applicable Plumbing Code.

D. Obtain permits, and request inspections from authority having jurisdiction.

E. Preinstallation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to the work.

1.10 FIELD CONDITIONS

A. Install Work in existing locations and as required or as directed unless prevented by field conditions.

B. Prepare drawings showing proposed re-arrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Owner's Representative before processing.

C. Do not install products or materials that are wet, moisture damaged, or mold damaged.

D. Environmental Limitations: Do not deliver or install products or materials until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

E. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit work to be performed according to manufacturer's written instructions and warranty requirements.

F. Field Measurements: Verify actual dimensions of openings and contiguous construction by field measurements before fabrication.

1.11 COORDINATION

A. Construct Work in sequence under provisions of Section 01 3100 "Project Management and Coordination."

B. Coordinate disconnections to minimize disruptions to Owner's occupancy.

C. Ensure sufficient materials and workforces are on hand for all operations. Do not take equipment or systems out of operation longer than one day, unless specifically authorized in writing by Owner's Representative.

1.12 PROJECT RECORD DOCUMENTS

A. Accurately record locations of utilities remaining, rerouted utilities, and new utilities by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Existing, modified, or replaced plumbing, piping, connections, and equipment shall withstand required pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, modification, or other defects in construction. Plumbing and piping shall remain watertight.
   1. Comply with performance requirements specified, as determined by testing assemblies representing those indicated for this Project.

2.2 MATERIALS

A. Primary Products: Those required for original installation.

B. Piping Materials:
   1. Cast-Iron Soil Pipe and Fittings: ASTM A 74, Class SV.
   2. Cast-Iron Downspout Boots: ASTM A-48, Class 35B

3. Push-on Gaskets for Cast Iron Soil Pipe: ASTM C 564.
4. Caulked Joints for CI Soil Pipe: FS HH- P-117, Type II.
5. No Hub Joints: ASTM D 3183.
6. Copper Tubing: ASTM B 75.
7. Wrought Copper Solder Fittings: ANSI B 16.22.
8. Steel Pipe: ASTM A 53B.
9. Malleable Iron Threaded Fittings: ANSI B 16.3.
10. Cast-Iron Threaded Fittings: FS WW-P-501E.
11. Flange Bolt, Sets: ASME Pressure Piping.
12. PVC Piping and Fittings: Schedule 40.
13. Unions in Copper or Brass Lines: 125 pound all brass, screwed pattern, ground joint, equal to Chase, Crane or Mueller.
14. Mechanical Couplings: Victaulic Style 77.
15. Piping Insulation and Cover: Closed cell insulation, minimum 2-inches thick.
    a. Exterior Exposure: Minimum 26 gage aluminum jacket protective cover, with lock bands.
    b. Interior: Match existing.

C. Downspout Nozzle: Cast bronze; Josam 25010 series or Zurn Z-199 with loose wall flange, sized to fit drain piping.

D. Product Substitution: For any proposed change in materials or for any new materials, submit request for substitution under provisions of Division 01 Section "Product Requirements".

2.3 TESTS

A. Provide testing of all relocated or modified systems and equipment under provisions of Section 01 4000 "Quality Requirements."

B. Test all existing drains, drain lines and associated components for leaks and blockage as per the General Notes of the Construction Drawings.

C. Test in accordance with recognized standards and as recommended by equipment manufacturers.

D. Notify Owner's Representative 24 hours prior to all testing.

E. Record all test results and corrective measures taken. Provide results to Owner with Project Record Documents under provisions of Section 01 7700 "Closeout Procedures."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during Work.

B. After uncovering existing work, inspect conditions affecting performance of Work.

C. Confirm operational condition of equipment and systems. Notify Owner in writing of any deficiencies prior to Work

D. Beginning Work means acceptance of existing conditions and responsibility to return system or equipment to operating condition upon completion of Work.

3.2 PREPARATION

A. Provide temporary supports to ensure structural integrity of the Work.

B. Provide devices and methods to protect other portions of Project from damage, debris, or contamination.

C. Provide protection from elements for areas that may be exposed by uncovering work.

D. Provide temporary connections and maintain operational capacity of systems or equipment that will be displaced more than one day, unless instructed otherwise.

3.3 DRAIN PIPING INSTALLATION

A. General: Coordinate with Owner and verify acceptable materials and installation methods prior to beginning work.

B. Install piping in general location indicated. Route to avoid existing equipment and utilities.

C. Provide hangers and bracing to adequately support and restrain piping when filled with water.

D. Slope piping approximately 1/8 inch per foot form overflow connection to exterior wall for discharge.

E. Test all joints and fittings to ensure pipes are water tight.

F. Provide downspout nozzle at pipe discharge and seal to exterior face of wall.

3.4 PERFORMANCE

A. Execute work by methods that will avoid damage to other Work and provide proper surfaces to accommodate reinstallation and reconnection.

B. Employ skilled and experienced installer to perform all operations.

C. Employ original installer to perform operations on systems or equipment under warranty.

D. Cut rigid materials using masonry saw or core drill. Pneumatic impact tools not allowed without prior approval.

E. Restore Work with new Products, as required for original installation, and in accordance with requirements of Contract Documents.

F. Fit Work air and water tight to adjacent elements and around penetrating elements.

3.5 TESTING AND ADJUSTING

A. Test all modified and relocated systems and equipment.
   1. Pressure test refrigerant piping prior to covering and recharging.
   2. Test gas lines in areas of Work in accordance with applicable codes and Utility Company recommendations.

B. Correct all deficiencies identified, including replacement of parts and components when required.

C. Adjust all Products and equipment to ensure proper operation and function.

3.6 CLEANING

A. Clean work under provisions of Section 01 7300 “Execution.”

B. Clean Owner occupied areas when soiled by Work or operations of this Division.

END OF SECTION 22 0500

SECTION 23 0500 – COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Common Work Results for HVAC specifically applicable to Division 23 Work, in addition to Division 01 - General Requirements.
2. Lifting, moving, re-installation, and minor modifications to existing equipment, curbs, and service lines and connections.
3. Anchors, brackets, fasteners, hardware, and accessories for related Work.
4. Aluminum A/C Stand

B. Related Sections:
1. Division 07 Section "Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing" for installation roof penetration flashings.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Existing, modified, or replaced HVAC equipment shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, modification, or other defects in construction. Ductwork shall remain watertight and airtight.

1.4 ACTION SUBMITTALS

A. Product List: Submit list of proposed Products and manufacturers, including all items specified in Part 2 – Products or otherwise required by the Work.

B. Product Data: For each type of product required.

C. Shop Drawings: For required modifications. Include plans, elevations, sections, details, and attachments to other work.
1. Provide layout of affected ductwork and piping, including:
   a. Riser diagrams.
   b. Hanger diagrams indicating proposed attachment and locations.
   c. Ductwork jointing and all special sheetmetal and insulating conditions.
2. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Wiring Diagrams: For power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

A. Schedule: List each area of work and all systems or equipment affected. Indicate proposed time of disconnection, re-connection, and duration for shutdowns.

B. Qualification Data: For qualified Installer.

1.6 CLOSEOUT SUBMITTALS

A. Welding certificates.

B. Maintenance Data: For proposed products or materials to include in maintenance manuals.

C. Operation and Maintenance Data: For proposed systems, subsystems, or equipment to include in operation and maintenance manuals.

1.7 QUALIFICATIONS

A. Installer: Company specializing in installing the work of this Division with a minimum of five (5) years documented experience working with the systems and Products in place and proposed or required. Licensed by jurisdictions having authority to perform the required work.

B. Installer Qualifications: An employer of workers trained and approved to perform required Work.

C. Conform to applicable Mechanical Code and other applicable regulations for all work performed under this Division.

D. Obtain permits, and request inspections from authority having jurisdiction.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

F. Preinstallation Conference: Conduct conference at Project site.

1.8 PROJECT CONDITIONS

A. Install Work in existing locations and as required or as directed unless prevented by Project conditions.

B. Prepare drawings showing proposed re-arrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Architect before processing.

C. Do not install products or materials that are wet, moisture damaged, or mold damaged.

D. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation to be performed according to manufacturer's written instructions and warranty requirements.

E. Field Measurements: Verify actual dimensions of contiguous construction by field measurements before fabrication.

1.9 COORDINATION

A. Construct Work in sequence under provisions of Division 01 Section "Project Management and Coordination."

B. Coordinate disconnections to minimize disruptions to Owner's occupancy.

C. Ensure sufficient materials and workforces are on hand for all operations. Do not take equipment or systems out of operation longer than one day, unless specifically authorized in writing by Owner's Representative.

1.10 PROJECT RECORD DOCUMENTS

A. Submit in accordance with Division 01 Sections "Submittals" and "Closeout Procedures".

B. Accurately record locations of utilities remaining, rerouted utilities, and new utilities by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Primary Products: Those required for original installation.

B. Aluminum A/C Stand: **(Alternate #2)**
1. Manufacturer: Miami Tech Inc. Located at 3611 NW 74th Street Miami, FL 33417 (305) 693-7054
2. Material: 6061 T6 Aluminum Alloy
3. Model: AST with telescopic cross-member and electrical disconnect bracket
4. Fasteners:
   a. To Concrete base: 3/8" Titan HD concrete anchors minimum embedment of 2.5".
   b. To Unit: ¼" stainless steel Thru bolts with 1" washers top ban and bottom. Utilize direct connection to unit framing or pre approved tie-down clips.
5. Stand Type: A (Standalone)
6. Unit width: 36" L x 36" W (measurement provided for bidding purposes only, contractor to field verity prior to ordering)
7. Post Height: 30 Inches.

C. Ductwork Materials:
1. Galvanized Steel: ASTM A 446, Grade A, G90, 24-gage minimum core steel, or as required for conditions.
2. Duct Lining: Mat faced duct liner; neoprene coated one side; minimum 1-inch thick; Linacoustic manufacturer by Manville.
   a. Average Thermal Conductivity: Maximum 0.26 BTU in/sq ft/degree F at mean temperature of 75 F.
3. Interior and Exterior Duct Joints Sealer: Kingco Seal-Rite 18-120, Blue Glue, and Hardcast.

D. Product Substitution: For any proposed change in materials or for any new materials, submit request for substitution under provisions of Division 15 Section "Product Requirements".

2.2 FABRICATION

A. Provide ductwork extensions or modifications where required due to movement or raising of mechanical equipment, in accordance with recognized industry standards and the following:
   1. Low Pressure Ducts: SMACNA HVAC Duct Construction Standards, Latest Edition.
   2. Pressure Class: 1-inch w.g., unless otherwise indicated.
   3. Elbows: Match existing or square, with factory-fabricated turning vanes.
   4. Changes in Direction: Rounded elbows with centerline radius equal to 1-1/2 times duct width, in plane of bend.
   5. Transitions in Size or Shape: Gradual slopes on all sides.
      a. Increases in Dimensions in the Direction of Air Flow: Maximum slope of 1:7 on any side.
      b. Decreases in Dimensions in the Direction of Air Flow: Maximum slope of 1:4.
   6. Ducts in Excess of 36-inches: Use SMACNA "J" and "F" connections.

B. Install duct liner in accordance with manufacturer's instructions using weld pins or Tuffbond adhesive and adhesive type metal clips.
   1. Do not reduce airflow area of existing ductwork.

C. Seal all joints water and air tight.

2.3 TESTS

A. Provide testing of all relocated or modified systems and equipment under provisions of Division 01 Section "Quality Requirements."

B. Test in accordance with recognized standards and as recommended by equipment manufacturers.

C. Notify Owner's Representative 24 hours prior to all testing.

D. Record all test results and corrective measures taken. Provide results to Owner with Project Record Documents under provisions of Division 01 Section "Closeout Procedures."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during Work.

B. After uncovering existing work, inspect conditions affecting performance of Work.

C. Confirm operational condition of equipment and systems. Notify Owner in writing of any deficiencies prior to Work

D. Beginning Work means acceptance of existing conditions and responsibility to return system or equipment to operating condition upon completion of Work.

3.2 PREPARATION

A. Provide temporary supports to ensure structural integrity of the Work.

B. Provide devices and methods to protect other portions of Project from damage, debris, or contamination.

C. Provide protection from elements for areas that may be exposed by uncovering work.

D. Provide temporary connections and maintain operational capacity of systems or equipment that will be displaced more than one day, unless instructed otherwise.

3.3 PERFORMANCE

A. Execute work by methods that will avoid damage to other Work and provide proper surfaces to accommodate reinstallation and reconnection.

B. Employ skilled and experienced installer to perform all operations.

C. Employ original installer to perform operations on systems or equipment under warranty.

D. Cut rigid materials using masonry saw or core drill. Pneumatic impact tools not allowed without prior approval.

E. Restore Work with new Products, as required for original installation, and in accordance with requirements of Contract Documents.

F. Fit Work air and water tight to adjacent elements and around penetrating elements.

3.4 TESTING AND ADJUSTING

A. Test all modified and relocated systems and equipment.
   1. Pressure test refrigerant piping prior to covering and recharging.
   2. Test gas lines in areas of Work in accordance with applicable codes and Utility Company recommendations.

B. Correct all deficiencies identified, including replacement of parts and components when required.

C. Adjust all Products and equipment to ensure proper operation and function.

3.5 CLEANING

A. Clean work under provisions of Division 01 Section “Execution.”

B. Clean Owner occupied areas when soiled by Work or operations of this Division.

END OF SECTION 23 0500

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Common Work Results for Electrical specifically applicable to Division 26 Work, in addition to Division 01 - General Requirements.
2. Lifting, moving, re-installation, repairs, and minor modifications to existing equipment, and service lines and connections.
3. Anchors, brackets, fasteners, hardware, and accessories for related Work.

B. Related Sections:
1. Division 07 Section “Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing” for installation roof penetration flashings.
2. Division 07 Section “Roof Accessories” for equipment support curbs and pipe support devices.

1.3 UNIT PRICES

A. Refer to Division 01 Section "Unit Prices" for description of Work in this Section affected by unit prices.

B. Replacement of Damaged or Deteriorated Roof Mounted Electrical Systems required to execute Roof Replacement Work:
1. Basis of Measurement: By ten (10) linear feet by each conduit size listed in Section 00 Document “Bid Form”.
2. Basis of Payment: Includes removal of damaged conduit, wiring, and associated materials and hardware; installation of new conduit, wiring, and all necessary hangers, supports, and hardware; and testing of repaired system prior to installation work covering repairs.

1.4 PERFORMANCE REQUIREMENTS

A. General Performance: Existing, modified, or replaced electrical equipment and appliances shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, modification, or other defects in construction. Electrical components shall remain watertight.

1.5 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

1.6 ACTION SUBMITTALS

A. Product List: Submit list of proposed Products and manufacturers, including all items specified in Part 2 – Products or otherwise required by the Work.

B. Product Data: For each type of product required.

C. Shop Drawings: For required modifications. Include plans, elevations, sections, details, and attachments to other work.
   1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   2. Wiring Diagrams: For power, signal, and control wiring.

1.7 INFORMATIONAL SUBMITTALS

A. Schedule: List each area of work and all systems or equipment affected. Indicate proposed time of disconnection, re-connection, and durations for shutdowns.

B. Qualification Data: For qualified Installer.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: For proposed products or materials to include in maintenance manuals.

B. Operation and Maintenance Data: For proposed systems, subsystems, or equipment to include in operation and maintenance manuals.

C. Closeout Submittals: Submit under provisions of Division 01 Section "Execution."
   1. Project Record Documents: Accurately record exact location of roof penetrations and any items installed but not visible after installation of roofing system or other Products.

1.9 QUALIFICATIONS

A. Installer: Company specializing in installing the work of this Division with a minimum of five (5) years documented experience working with the systems and Products in place and proposed or required. Licensed by jurisdictions having authority to perform the required work.

B. Installer Qualifications: An employer of workers trained and approved to perform required Work.

C. Conform to NFPA 70 and applicable Building Code for all electrical work.

D. Obtain permits, and request inspections from authority having jurisdiction.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

F. Preinstallation Conference: Conduct conference at Project site.

1.10 PROJECT CONDITIONS

A. Repair electrical conduit and devices as required by roofing replacement Work in existing locations and as directed or as required unless prevented by Project conditions.

B. Install Work in existing locations and as required or as directed unless prevented by Project conditions.

C. Prepare drawings showing proposed re-arrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Architect before proceeding.

D. Do not install products or materials that are wet, moisture damaged, or mold damaged.

E. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit required work to be performed according to manufacturer's written instructions and warranty requirements.

F. Field Measurements: Verify actual dimensions of contiguous construction by field measurements before fabrication.

1.11 COORDINATION

A. Construct Work in sequence under provisions of Division 01 Section "Project Management and Coordination."

B. Coordinate disconnections to minimize disruptions to Owner's occupancy.

C. Coordinate with other Trades and Owner to ensure electrical installation does not inhibit other Work.

D. Ensure sufficient materials and workforces are on hand for all operations. Do not take equipment or systems out of operation longer than one day, unless specifically authorized in writing by Owner's Representative.

1.12 PROJECT RECORD DOCUMENTS

A. Accurately record locations of electrical equipment, appliances, and conduits remaining, rerouted conduits, and new electrical equipment and wiring by horizontal dimensions and elevations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Primary Products: Those required for original installation.

B. Product Substitution: For any proposed change in materials or for any new materials, submit request for substitution under provisions of Division 1 Section "Product Requirements."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during Work.

B. After uncovering existing work, inspect conditions affecting performance of Work.

C. Confirm operational condition of equipment and systems. Notify Owner in writing of any deficiencies prior to Work

D. Beginning Work means acceptance of existing conditions and responsibility to return system or equipment to operating condition upon completion of Work.

3.2 PREPARATION

A. Provide temporary supports to ensure structural integrity of the Work.

B. Provide devices and methods to protect other portions of Project from damage, debris, or contamination.

C. Provide protection from elements for areas that may be exposed by uncovering work.

D. Provide temporary connections and maintain operational capacity of systems or equipment that will be displaced more than one day, unless instructed otherwise.

3.3 PERFORMANCE

A. Execute work by methods that will avoid damage to other Work and provide proper terminations to accommodate reinstallation and reconnection.

B. Employ skilled and experienced installer to perform all operations.

C. Employ original installer to perform operations on systems or equipment under warranty.

D. Cut rigid materials using masonry saw or core drill. Pneumatic impact tools not allowed without prior approval.

E. Restore Work with new Products, as required for original installation, and in accordance with requirements of Contract Documents.

F. Fit Work water tight to adjacent elements and around penetrating elements.

3.4 ELECTRICAL WIRING AND SYSTEMS REPAIRS

A. Verify need and extent of all repairs with Owner's Representative. Coordinate shut down and start-up requirements for each systems and each occurrence.

B. Remove conduit and associated materials from point of damaged to nearest pull box or other connection point in both directions, unless instructed otherwise by Owner's Representative.

C. Replace with new conduit and wiring of same diameter and gage as original.

D. Use screwed or welded connections to match existing conditions.

E. After repairs are completed, but prior to covering or concealing repaired elements, test repairs at full load or power, under observation by Owner's Representative.

F. Seal all connections watertight, including those between new and existing materials.

3.5 TESTING AND ADJUSTING

A. Test all modified and relocated systems and equipment.

B. Correct all deficiencies identified, including replacement of parts and components when required.

C. Adjust all Products and equipment to ensure proper operation and function.

3.6 CLEANING

A. Clean work under provisions of Division 01 Section “Execution.”

B. Clean Owner occupied areas when soiled by Work or operations of this Division.

END OF SECTION 26 0500