DENTON
INDEPENDENT SCHOOL DISTRICT

SPECIFICATIONS FOR

REROOFING PROJECTS

AT

SERVICE CENTER ANNEX (BID ITEM 1A)

MCMATH MIDDLE SCHOOL (BID ITEM 1B)

FOR THE

DENTON INDEPENDENT SCHOOL DISTRICT

PROJECT NUMBER:	CSP 1902-08
PRE-PROPOSAL MEETING:	WEDNESDAY, FEBRUARY 6, 2019, 8:30 A.M.
PROPOSAL DATE:	TUESDAY, FEBRUARY 26, 2019, 2:00 P.M.

02-01-2019

Armko Industries, Inc.
Texas Registered Engineering Firm
F-006498

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Armko Industries, Inc.
Texas Registered Engineering Firm
F-006498

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SECTION 00 41 00
PROPOSAL FORM

NAME OF CONTRACTOR:_____

DATE:_____

MS. CHERYL FARMER
SENIOR BUYER
DENTON INDEPENDENT SCHOOL DISTRICT
1303 N. ELM
DENTON, TX 76201

Dear Ms. Farmer:

The undersigned, in compliance with your advertisement for competitive sealed proposals for reroofing on certain areas of the following building:

"CSP 1902-08 REROOFING PROJECTS
BID ITEM 1A – SERVICE CENTER ANNEX
BID ITEM 1B – MCMATH MIDDLE SCHOOL
FOR DENTON ISD"

have examined the Drawings and Specifications, together with the related documents and all conditions surrounding the work, and having visited the sites of the proposed work, hereby, proposes to furnish all work in every detail in accordance with the Contract Documents within the time set forth herein and at the prices following. These prices shall cover all expenses incurred in performing the work under the Contract Documents, of which the Proposal is a part.

Attached herewith, please find (Cashier's Check) (Certified Check) (Bid Bond) in the amount of $_____ which is five percent (5%) of the proposal.

I (or we) acknowledge receipt of the following addenda:

ADDENDUM #1:_____(Initial)

ADDENDUM #2:_____(Initial)

ADDENDUM #3:_____(Initial)

Competitive sealed proposals addressed to Ms. Cheryl Farmer, Senior Buyer, Denton Independent School District, for reroofing certain areas at Service Center Annex and McMath Middle School, located in Denton, TX, all in accordance with the Proposal, Contract Documents, General Instructions, Materials, Execution, and Drawings, will be received at the Denton ISD Purchasing Department, 1303 N. Elm, Denton, TX 76201, **no later than 2:00 P.M., on Tuesday, February 26, 2019.**

RESPONDENTS ARE CAUTIONED TO READ THE INFORMATION CONTAINED IN THIS CSP CAREFULLY AND TO SUBMIT A COMPLETE RESPONSE TO ALL REQUIREMENTS AND QUESTIONS AS DIRECTED.

Proposals will be publicly opened and will not be read aloud.

PROPOSALS SUBMITTED AFTER THE SPECIFIED DATE AND TIME WILL NOT BE ACCEPTED. The CSP materials submitted must be enclosed in a sealed envelope (box or container) clearly labeled on the outside with the following information:

"CSP 1902-08 REROOFING PROJECTS
BID ITEM 1A – SERVICE CENTER ANNEX
BID ITEM 1B – MCMATH MIDDLE SCHOOL
FOR DENTON ISD"

No oral, telephone, or telegraphic proposals will be considered.

It is highly recommended that the contractor attend the Pre-Proposal Conference which will be held at 8:30 A.M., on Wednesday, February 6, 2019, at Service Center Annex located at 230 N. Mayhill Road, Denton, Texas 76208 and then moving on to McMath Middle School located at 1900 Jason Drive, Denton, TX 76205. The Proposal, Contract Documents, General Instructions, Materials, Execution, and Drawings may be obtained at the Pre-Proposal Conference. These documents will also be available at the Denton ISD Purchasing Dept.1303 N. Elm St., Denton, TX 76201 or on the Purchasing Department page of the Denton ISD website www.dentonisd.org. All addenda issued by Denton ISD prior to the time that responses are received shall be considered part of the CSP and Respondent shall be required to consider and acknowledge receipt of such in the response. Firms receiving this CSP other than directly from Denton ISD are responsible for obtaining any addendum (amendment) in the event an addendum is issued.

To inspect the facility work for this project prior to submitting the proposal, Contractor shall contact Mr. Paul Andress, Executive Director of Operations, 940.369.0200. Any questions concerning the specifications, specified work, and/or roof inspection should be directed in writing to Ms. Cheryl Farmer, cfarmer@dentonisd.org.

This will be a Turnkey project. During any fiscal year of this agreement the Board of Trustees fails to appropriate funds, the District will immediately notify the contractor and relieve them of their obligations under this agreement. Contractor shall provide references to the Owner. Contractor shall also submit a total of one (1) original, one (1) copy and (1) USB drive.

A Cashier's Check, Certified Check, or acceptable Surety Company Bid Proposal Bond in the amount of five percent (5%) of the largest possible total of proposal submitted will be required with each proposal if the total

contract price exceeds $25,000.00. Proposals will be received PER ATTACHED PROPOSAL FORM, to include all work shown and specified.
The Board of Trustees of the Denton Independent School District reserves the right to reject any one and/or all proposals, to waive any formalities or irregularities, and to award the Contract in the best interest of the School District.

CONTRACT DOCUMENTS: Having examined the Proposal, Contract, General Instructions, Materials, Execution, and Drawings for CSP Project No. 1902-08 and conditions for reroofing work, and having examined the premises and circumstances affecting the work, the undersigned offer:

OFFER: 1. To furnish all labor, material, tools, equipment, transportation, bonds, all applicable taxes, incidentals, and other facilities, and to perform all work for the said reroofing for the following areas for a turnkey project:

BID ITEM 1A – ANNEX BUILDING - ROOF AREAS AS SHOWN ON DRAWINGS

Remove and replace existing low sloped roof system with new roof system as specified and detailed herein, including all miscellaneous sheet metal, gutters, downspouts and metal wall panels and wall repair for the sum of:

_____ $_____

BID ITEM 1B – MCMATH MIDDLE SCHOOL - ROOF AREAS AS SHOWN ON DRAWINGS

Remove and replace existing low sloped roof system with new roof system as specified and detailed herein, including all miscellaneous sheet metal, gutters, downspouts and metal wall panels and wall repair for the sum of:

_____ $_____

2. Prequalification's: Contractor shall submit and/or answer the following:

   a. Contractor shall submit documentation with their proposal to indicate their specific qualifications to perform the specified work, including, but not limited to, all Independent School Districts in the State of Texas where said company has worked. Contractor Initial_____
   b. Within the last five years, has legal action, including, but not limited to, deceptive trade practices suits, been taken against your company for failure to perform work properly or for not completing a project? Yes____ No____ If yes, attach a separate sheet of explanation.
   c. Within the last five years, has your organization or any officer/partner of your organization ever been an officer/partner of an organization that failed to complete a construction contract? Yes____ No____. If so, attach a separate sheet of explanation.
   d. Within the last five years, has your organization or any officer/partner of your organization filed for bankruptcy? Yes____ No____. If so, attach a separate sheet of explanation.
   e. Attach an AIA Document No. A305 with a separate sheet with all references including all Independent School Districts. Include contact name and telephone numbers for each and every reference.
   f. Include a current year end review statement.
   g. Include a current year W9 statement.

EXAMINATION OF SITE: 3. By signing the Proposal Form, Contractor acknowledges he or an authorized representative has examined the roofs and is aware of all field conditions (rooftop equipment, penetrations, roof drains, etc.) which may affect the work.

Upon receipt of Notice of Acceptance of this proposal, I (or we) agree to execute the formal contract within ten (10) calendar days thereafter, and to deliver an Insurance Certificate, a ONE HUNDRED PERCENT (100%) STATUTORY PAYMENT BOND and a SURETY BOND in the amount of ONE HUNDRED PERCENT (100%) of the contract price for the faithful performance of the contract, as required.

The undersigned agrees to complete all work shown on the drawings and in the specifications within the time limits set forth below subject to additional days that may be added due to inclement weather and/or other justified and reasonable extensions of time as may be approved by the Owner.

Date to Commence and Stockpile Date shall be determined at the Walk-Through Conference: Work may not commence at each facility until May 24th, 2019, and shall be complete by August 15th, 2019. Contractors that are awarded contracts shall be prepared to immediately sit down with Denton ISD Representatives and present a plan that will illustrate how progression of work is to take place to ensure completion of all work within specified time limits. The time limits are as follows:

If a Contractor is awarded the project, project must be completed in a timely manner with production averaging 1,500 square feet per day minimum from start date or Contractor will be subject to liquidated damages as set forth below.

A working day is defined as a calendar day, not including Saturdays, Sundays, or legal holidays, in which weather or other conditions not under the control of the company will permit the performance of the principal units of work underway for a continuous period of not less than seven (7) hours between 7:00 A.M. and 6:00 P.M. For every Saturday on which the company chooses to work, one day will be charged against the working time when weather conditions will permit seven (7) hours of work as delineated above. A principal unit of work shall be that unit which controls the completion time of the agreement. Nothing in this item shall be construed as prohibiting the company from working on Saturdays if it so desires. If Sunday work is permitted by the Owner, time will be charged on the same basis as weekdays.

THE OFFICIAL WEATHER RECORD WILL BE KEPT IN THE DENTON ISD EXECUTIVE DIRECTOR OF MAINTENANCE'S OFFICE.

In submitting this proposal, it is understood that the contractor shall provide part of this proposal and contain the following information:

a. Site plan showing staging areas to accomplish the scope of work _____
b. Roof plan showing schedule of construction and location sequence of work _____
c. Name and qualifications of superintendent _____
d. Name and qualifications of Project Manager _____
e. List current work load _____
f. Acknowledgment that Company owner will be in attendance at each weekly meeting _____

The undersigned agrees that the Owner may retain the sum of ONE HUNDRED FIFTY DOLLARS ($150.00) from the amount to be paid to the undersigned for each calendar day that the work contracted remains incomplete beyond the time set forth, Sundays and holidays INCLUDED. This amount is agreed upon as the proper measure of liquidated damages which the Owner will sustain per day by failure of the undersigned to complete the work at the stipulated time, and is not to be construed in any sense as a penalty.

I (or we) agree to promptly furnish a correct and current financial statement of condition with list of owned equipment and an experience record of completed projects for examination by owner and architect, if same is required.

SEAL (If by Corporation)

RESPECTFULLY SUBMITTED BY

_____
(Name)

_____
(Title)

_____
(Address)

_____

_____

Indicate if: ( ) Partnership ( ) Corporation ( ) Sole Owner

If a partnership, list names and addresses of partners:

_____

_____

If corporation, indicate state in which corporation was organized and is existing:_____

Principal Stockholders: (Name and Address)

_____

_____

_____

_____

CONFLICT OF INTEREST:

In accordance with Section 176.006 of the Local Government Code: Effective January 1, 2006, any vendor that "contracts or seeks to contract for the sale or purchase of property, goods, or services with a local government entity; or is an agent of a person in the person's business with the local governmental entity", must have a Conflict of Interest Questionnaire on file with Denton ISD Procurement Department.

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of vendor who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.** (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information is being disclosed.**

_____
Name of Officer

4 **Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.**

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☐ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

5 **Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.**

6 ☐ Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7

_____ _____
Signature of vendor doing business with the governmental entity Date

Form provided by Texas Ethics Commission www.ethics.state.tx.us Revised 11/30/2015

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

(A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;

(B) a transaction conducted at a price and subject to terms available to the public; or

(C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

***

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or

(C) of a family relationship with a local government officer.

Form provided by Texas Ethics Commission www.ethics.state.tx.us Revised 11/30/2015

FELONY CONVICTION NOTIFICATION

I, the undersigned agent for the firm named below, certify that the information concerning notification of felony convictions has been reviewed by me and the following information furnished is true to the best of my knowledge:

Texas Education Code, Section 44.034, Notification of Criminal History, Subsection (a), states a person or business entity that enters into a contract with a school district must give advance notice to the district if the person or an owner or operator of the business entity has been convicted of a felony. The notice must include a general description of the conduct resulting in the conviction of a felony.

Subsection (b) states "a school district may terminate a contract with a person or business entity if the district determines that the person or business entity failed to give notice as required by Subsection (a) or misrepresented the conduct resulting in the conviction. The district must compensate the person or business entity for services performed before the termination of the contract".

THIS NOTICE IS NOT REQUIRED OF A PUBLICLY-HELD CORPORATION

VENDOR'S NAME: _____

AUTHORIZED COMPANY OFFICIAL'S NAME (Printed): _____

1. My firm is a publicly-held corporation, therefore, this reporting requirement is not applicable.

   Signature of Company Official: _____

OR

2. My firm is neither owned nor operated by anyone who has been convicted of a felony.

   Signature of Company Official: _____

OR

3. My firm is owned or operated by the following individuals(s) who has/have been convicted of a felony:

Name of Felon(s): _____

Details of Conviction(s): _____

_____

Signature of Company Official: _____

Date: _____ , 2019

DEBARMENT OR SUSPENSION CERTIFICATION FORM

Non-Federal entities are prohibited from contracting with or making sub-awards under covered transaction to parties that are suspended or debarred or whose principals are suspended or debarred. Covered transactions include procurement of goods or services equal to or in excess of $100,000. Vendors receiving individual awards of $100,000 or more and all sub-recipients must certify that the organizations and its principals are not suspended or debarred.

By submitting this offer and signing this certificate, this Proposer:

- Certifies that neither it nor its principals is presently debarred, suspended, proposed for debarment, declares ineligible or voluntarily excluded from participation in this transaction by any Federal department or agency.

Firm's Name:

_____

Authorized Company Official's Name:

_____
(Typed or printed)

Title of Authorized Representative:

_____
(Typed or printed)

Signature of Authorized Company Official:

_____

Date Signed:

_____

Model SB 9 Contractor Certification Form

Criminal History Record Information Review of Certain Contract Employees

Introduction: Texas Education Code Chapter 22 requires service contractors to obtain criminal history record information regarding covered employees and to certify to the District that they have done so. Covered employees with disqualifying convictions are prohibited from serving at a school district.

Definitions:
Covered employees: Includes all employees of a contractor (to include any subcontractors and/or independent contractors) who have or will have continuing duties related to the service to be performed at the District and have or will have direct contact with students. The District will be the final arbiter of what constitutes direct contact with students.

Disqualifying conviction: One of the following offenses, if at the time of the offense: (a) a felony offense under Title 5, Texas Penal Code; (b) an offense for which a defendant is required to register as a sex offender under Chapter 62, Texas Code of Criminal Procedure; or c) an equivalent offense under federal law or the laws of another state.

On behalf of _____ ("Name of Contractor"), I

First Name: _____ Last Name:_____

Address: _____ City: _____State:_____

Zip: _____ Telephone: _____Fax: _____ Email:_____ ___

Certify that [check one]:

[ ] None of Contractor's employees are *covered employees*, as defined above.
Or
[ ] Some or all of the Contractor's employee are *covered employees.* If this box is selected, I further certify that:

Contractor has obtained all required criminal history record information, through the Texas Department of Public Safety, regarding its covered employees. None of the covered employees has a disqualifying conviction. Contractor has taken reasonable steps to ensure that its employees who are not covered employees do not have continuing duties related to the contract services or direct contact with students.

If Contractor receives information that a covered employee has a disqualifying conviction, Contractor will immediately remove the covered employee from contract duties and notify the District in writing within three (3) business days.

Upon request, Contractor will make available for the District's inspection the criminal history record information of any covered employee. If the District objects to the assignment of a covered employee on the basis of the covered employee's criminal history record information, Contractor agrees to discontinue using that covered employee to provide services at the District.

Noncompliance by the Contractor with this certification may be grounds for contract termination.

_____ _____

Signature Date

House Bill 89 VERIFICATION

I,_____(Person name), the undersigned

representative of (Company or Business name)_____

_____

(hereafter referred to as company) **do hereby verify that the company named-above, under the provisions of Subtitle F, Title 10, Government Code Chapter 2270:**

1. **Does not boycott Israel currently; and**
2. **Will not boycott Israel during the term of the contract the above- named Company, business or individual with the Keller Independent School District.**

Pursuant to Section 2270.001, Texas Government Code:

1. *"Boycott Israel" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes; and*
2. *"Company" means a for-profit sole proprietorship, organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or any limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of those entities or business associations that exist to make a profit.*

_____ _____

DATE *SIGNATURE OF COMPANY REPRESENTATIVE*

VENDOR DATA FORM

1. For Purchase Orders: ORDERING ADDRESS INFORMATION

Company Name: _____

dba Name: _____

Address: _____

_____

Business Phone: _____ Fax: _____

Contact Person: _____ Email: _____

Web address: _____

Indicate how your company would receive Purchase Orders from Denton ISD.

By Email: Yes _____ No _____ Email address: _____

By Fax: Yes _____ No _____ Fax: _____

By Mail: Yes _____ No _____ Address: _____

_____

Representative Name: _____

Contact Number: _____ Email: _____

Purchasing Cooperatives: _____

2. For Payments: REMITTANCE ADDRESS INFORMATION

Company Name: _____

Address: _____

_____

_____

Business Phone: _____ Fax: _____

Contact Person: _____ Email: _____

3. For BID/PROPOSAL Notifications: ADDRESS INFORMATION

Company Name: _____

Address: _____

_____

_____

Business Phone: _____ Fax: _____

Contact Person: _____ Email: _____

NON-COLLUSION STATEMENT

"The undersigned affirms that he/she is duly authorized to execute this RFQ, that this company, corporation, firm, partnership or individual has not prepared this RFQ in collusion with any other bidder/proposer, and that the contents of this RFQ as to prices, terms or conditions of said RFQ have not been communicated by the undersigned nor by any employee or agent to any other person engaged in this type of business prior to the official opening of this RFQ."

Firm Name: _____

Address: _____

City/State/Zip: _____

Telephone #: _____ Fax #: _____

Bidder Signature: _____

Printed Name: _____

Position/Title: _____ Date Signed: _____

Signature of Company Official Authorizing RFQ: _____

Name of Company Official: ***(Please type/print)*** _____

Official Position: _____ Date Signed: _____

Firm hereby assigns to purchaser any and all claims for overcharges associated with this RFQ which arise under the antitrust laws of the United States, 15 USCA Section 1 and which arise under the antitrust laws of the State of Texas, Business and Commerce Code, Section 15.01.

CERTIFICATION REGARDING LOBBYING

Applicable to Grants, Sub grants, Cooperative Agreements, and Contracts Exceeding $100,000 in Federal Funds.

Submission of this certification is a prerequisite for making or entering into this transaction and is imposed by section 1352, Title 31, U. S. Code. This certification is a material representative of fact upon which reliance was placed when this transaction was made or entered into. Any person who fails the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The undersigned certifies, to the best of his or her knowledge and belief, that:

1) No Federal appropriated funds have been paid or will be paid by or on behalf of the Undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer of employee of congress, or an employee of a Member of Congress in connection with the awarding of a Federal contract, the making of a Federal grant, the making of a Federal loan, the entering into a cooperative agreement, and the extension, continuation, renewable, amendment, or modification of a Federal contract, grant, loan, or cooperative agreement.

2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of congress, or an employee of a Member of Congress in connection with this Federal grant or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, “disclosure Form to Reporting Lobbying,” in accordance with its instructions.

3) The undersigned shall require that the language of this certification be included in the award documents for all covered sub awards exceeding $100,000 in Federal funds at all appropriate tiers and that all sub recipients shall certify and disclose accordingly.

(PLEASE TYPE OR PRINT CLEARLY)

_____	_____
(Company Name)	(Company Address)
_____	_____
(Name of Submitting Official)	(Company Address – City, State, Zip)
_____	_____
(Signature)	(Date)

CLEAN AIR AND WATER ACT COMPLIANCE

I, the vendor, am in compliance with the Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended and understand that contracts and sub-grants of amounts in excess of $150,000 must contain a provision that requires the non-Federal award to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387) and that violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

(Please Type or Print Clearly)

Name of Company: _____

Address of Company: _____

Title of Submitting Official: _____

Signature: _____

TOXIC CONTROL AFFIDAVIT

Denton ISD has established Management Plans for ensuring a high level of environmental air quality through its Operations Department. All contractors performing construction projects for DISD must familiarize themselves with these Management Plans and comply prior with the beginning of any awarded construction project. DISD employees are available to review such Plans and assist in interpretation and understanding its Asbestos Management Plans at any time prior to beginning construction.

Certification of non-use of Asbestos and Lead Containing Materials is required by all General and Sub Contractors for all construction projects, by State and Federal regulations which Denton ISD is subject to. Completion of this Affidavit is mandatory before final payment on a project will be made. Complete this certificate, have it notarized and submit it with your application for final payment, certifying that no materials used in conjunction with this project contain asbestos or lead in any form and that all Material Safety Data Sheets (MSDA) have been supplied to Owner before submitting application for final payment.

ASBESTOS AND LEAD-FREE MATERIALS

I, the undersigned agent for the company/firm or individual named below, certify that materials supplied by me and used in conjunction with this project contained neither Asbestos nor Lead and are non-toxic in nature. I further certify this statement to be true for the project contracted with Owner as described below:

Project No. _____ School/Facility: _____

Description of project, including specific areas within school/facility certified as Asbestos/Lead free. Include building map, if necessary. Use facility name and room numbers where applicable: _____

_____

_____

_____

Contractor's Name: _____

Authorized Company Official's Name: _____
(Printed or Typed)

The claim contained within this affidavit is subscribed and swore before me, a Notary Public, this _____ day of _____, 20____.

Notary Public, State of _____

_____
Signature

_____
Printed Name

(Seal)

_____
Date of Commission Expires

REFERENCES

Please provide three (3) references, preferably from school districts, who have used your services within the last three years. Additional references may be required. DO NOT LIST DENTON ISD EMPLOYEES, FORMER OR CURRENT AS REFERENCES.

1. Company Name: _____

   Address: _____

   _____

   _____

   Business Phone: _____ Fax: _____

   Contact Person: _____ Email: _____

   Description of project or work completed: _____

   _____

   _____

2. Company Name: _____

   Address: _____

   _____

   _____

   Business Phone: _____ Fax: _____

   Contact Person: _____ Email: _____

   Description of project or work completed: _____

   _____

   _____

3. Company Name: _____

   Address: _____

   _____

   _____

   Business Phone: _____ Fax: _____

   Contact Person: _____ Email: _____

   Description of project or work completed: _____

   _____

   _____

DATE:_____ PROJECT NO.: CSP 1902-08

PROPOSAL DATE: FEBRUARY 26, 2019

NOTICE OF ACCEPTANCE OF PROPOSAL

AND

INTENT TO AWARD CONTRACT

This is to notify _____ that your company is the apparent
Name of Contracting Company

successful Contractor for Service Center Annex and McMath Middle School,

and that your proposal has been accepted based on receipt of all required submittals. All submittals as required in General Instructions Part 1 of the Specification Package shall be submitted to the Owner/Owner's representative within ten (10) calendar days of the date of this notice.

DENTON INDEPENDENT SCHOOL DISTRICT
1303 N. ELM

DENTON, TX 76201

_____
Signature

_____
(Printed Name

END OF SECTION 00 41 00

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ **Go to *www.irs.gov/FormW9* for instructions and the latest information.**

Give Form to the requester. Do not send to the IRS.

Print or type. See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

		–							

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here **Signature of U.S. person** ▶ **Date** ▶

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

SECTION 00 42 13
UNIT PRICES

PART 1 - GENERAL

1.01 UNIT PRICE PROPOSAL:

1. Remove and replace damaged metal decking: $_____ per square foot.

2. Remove and replace deteriorated nailers: $_____ per board foot.

3. Install four-inch (4") roof drain: $_____ each.

4. Remove and replace damaged 3/4" thick plywood decking: $_____ per square foot

5. Install four-inch (4") PVC drain line complete with all connections, elbows, and U.L. rated insulation, etc.: $_____ per linear foot. Provide U.L. rated wrap insulation for one (1) hour rating.

6. Additional cost over and above the contract amount for weekend or overtime requested by the Owner: $_____ cost per man per hour.

END OF SECTION 00 42 13

SECTION 01 10 00
GENERAL REQUIREMENTS

1.01 QUALIFICATIONS FOR SUBMITTING COMPETITIVE SEALED PROPOSAL

A. To qualify for submitting a proposal, each contractor is required to obtain a copy of the Proposal Documents. It is highly recommended that the contractor attend the Pre-Proposal Conference which will be held at 8:30 A.M., on Wednesday, February 6, 2019, at Service Center Annex located at 230 N. Mayhill Road, Denton, Texas 76208 and then moving on to McMath Middle School located at 1900 Jason Drive, Denton, TX 76205.

B. In submitting this proposal, it is understood that the contractor shall provide part of this proposal and contain the following information:
   a. Site plan showing staging areas to accomplish the scope of work
   b. Roof plan showing schedule of construction and location sequence of work
   c. Name and qualifications of superintendent
   d. Name and qualifications of Project Manager
   e. List current work load
   f. Acknowledgment that Company owner will be in attendance at each weekly meeting

1.02 BID PROPOSAL BONDS

A. AN ACCEPTABLE SURETY COMPANY BID PROPOSAL BOND or CERTIFIED CHECK for the amount not less than five percent (5%) of the proposal amount shall accompany each proposal. By "Acceptable Surety" is meant an Insurance Company licensed by the Texas State Board of Insurance to act as surety, rated "A" or better, listed in the Federal Register, and having an unblemished record. The check or bond of each unsuccessful Contractor will be returned within ten (10) days after the proposal is awarded. FAILURE OF AN ACCEPTED CONTRACTOR TO ENTER INTO A CONTRACT TO COMPLETE THE SPECIFIED WORK MAY CAUSE FORFEITURE OF HIS SEALED PROPOSAL SECURITY. FAILURE TO SUBMIT PROPER SEALED PROPOSAL SECURITY SHALL CAUSE REJECTION OF THE PROPOSAL.

1.03 BOND AND INSURANCE SUBMITTALS

A. The successful Contractor shall be required to furnish the appropriate certificates of insurance, and the executed Payment and Performance Bonds, if required, prior to starting the project.

B. Bonds: Prior to commencement of Work hereunder, Contractor will, if the Contract Price exceeds $25,000.00, provide an Acceptable Surety Company Payment Bond, and if the Contract Price exceeds $100,000.00, provide an Acceptable Surety Company Performance Bond, each in principal amount equal to one hundred percent (100%) of the Contract Price, conditioned that Contractor will faithfully perform all its undertakings in this Contract and will fully pay all persons furnishing labor and material in the prosecution of the Work provided for in this Contract. If any surety upon any bond becomes insolvent or otherwise ceases to do business in this State, the Contractor shall promptly furnish equivalent security to protect the interests of Denton ISD and of persons furnishing labor and materials in the prosecution of the Work.

1.04 INSURANCE

A. The Contractor shall maintain insurance of the kinds and in the amounts specified below and furnish Denton Independent School District with Certificates of Insurance as evidence thereof in the prescribed form. If any work provided for or to be performed under any Specifications is sub-let (as otherwise permitted by the terms of such Specifications), the Contractor shall require the Subcontractor to maintain and furnish him with satisfactory evidence of Workmen's Compensation, Employer's Liability and such other forms and amounts of insurance which the Contractor deems reasonably adequate.

B. The Contractor will provide and maintain standard fire, extended coverage perils, vandalism and malicious mischief insurance to protect the interest of both the Contractor and the Owner for materials brought into the job or stored on the premises. Such insurance shall be for one hundred percent (100%) of the insurable value of the work to be performed including all items of labor and materials incorporated therein, materials stored at the job-site to be used in completing the work, and such other supplies and equipment incidental to the work as are not owned or rented by the Contractor, the costs of which are included in the direct cost of the work.

C. This insurance shall not cover any tools, derricks, machinery, tar buckets, ladders, engines, workmen's quarters, boilers, pumps, wagons, scaffolds, forms, compressors, shanties, or other items owned or rented by the Contractor, the cost of which is not included in the direct cost of the work.

D. In accordance with above items, the Contractor shall maintain the following insurance:

Contractor shall carry throughout the life of this Contract, at his expense, with insurers satisfactory to Denton ISD, insurance of not less than the following limits:

Coverage	Minimum Limit
Workmen's Compensation	Statutory
Employer's Liability	$500,000
Comprehensive General Liability	
Each Occurrence	$1,000,000
General Aggregate	$2,000,000
Comprehensive Automobile Liability	
Combined Single Limit	$1,000,000
Builder's Risk	Fully Insurable Value of the Work
"Umbrella" Liability Contract Value up to $3,000,000	$1,000,000

E. This Insurance shall:

1. list Denton Independent School District as additional insured on all policies except Workmen's Compensation;

2. include Waiver of Subrogation on all policies in favor of Denton Independent School District;
3. include coverage for the liability assumed by the Contractor;
4. include completed operation coverage which is to be kept in force by the Contractor for a period of not less than one year after completion of the work provided for or performed under these specifications;
5. not be subject to any of the special property damage liability exclusions commonly referred to as the XCU exclusions pertaining to blasting or explosion, collapse or structural damage and underground property;
6. not be subject to any exclusion of property used by the insured or property in the case, custody or control of the insured or property as to which the insured for any purpose is exercising physical control; and
7. the Certificates of Insurance furnished by the Contractor shall show by specific reference that each of the foregoing items have been provided for.

F. The Certificates of Insurance furnished by the Contractor as evidence of the insurance maintained by him shall include a clause obligating the Insurer to give Denton Independent School District ten (10) days prior written notice of cancellation or any material change in the insurance.

1.05 DESCRIPTION OF WORK

A. It is the intent of the specification that the new work will provide a watertight facility. The attached specifications describe the minimum acceptable standards of construction and finish.

B. Tear off the existing roof system down to the existing roof deck and provide a new roof system as indicated in these specifications for the Denton ISD facilities known as Evers Park Elementary School and Ryan High School. The roof shall be installed in accordance with the attached specifications and drawings and in strict accordance with the manufacturer's recommended procedures.

1.06 CHANGES

A. Changes to specifications and drawings will not be acceptable unless approved in writing by the manufacturer and the Owner.

1.07 TAXES

A. Except as otherwise provided in the Contract Documents the Contract Price includes all applicable federal, state and local taxes. The purchase, lease, rental, storage, use or other consumption of tangible personal property, for the performance of this Contract by the Contractor, is exempted from state and local sales tax pursuant to the provisions of Article 20.04 (Y) of the Texas Limited Sales Excise and Use Tax Act. To claim the benefit of this exemption, the Contractor must comply with such procedures as may be prescribed by the State Comptroller of Public Accounts.

1.08 WORKING TIME

A. A working day is defined as a calendar day, not including Saturdays, Sundays, or legal holidays, in which weather or other conditions not under the control of the company will permit the performance of the principal units of work underway for a continuous period of not less than seven (7) hours between 7:00 A.M. and 6:00 P.M. For every Saturday on which the company chooses to work, one day will be charged against the working time when weather conditions will permit seven (7) hours of work as delineated above. A principal unit of work shall be that unit which controls the completion time of the agreement. Nothing in this item shall be construed as prohibiting the company from working on Saturdays if it so desires. If Sunday work is permitted by the Owner, working time will be charged on the same basis as weekdays.

1.09 INSPECTION

A. An inspection shall be made by a representative of the material manufacturer of the completed project to ensure that said project was installed in accordance with the manufacturer's specifications and illustrated details. Upon this approval of the project, the specified warranty or warranties shall be written.

1.10 BASE LUMP SUM PROPOSAL

A. The Contractor will furnish all labor and materials, and all of the collective costs applicable will be shown as total Base Lump Sum Proposal costs by bid proposal.

1.11 QUALITY ASSURANCE

A. All work and materials hereinafter specified shall be best of kind described and, unless specified otherwise, shall be new and of best quality. The specified roofing system shall have been used successfully in the United States for a minimum of ten (10) years.

B. All materials will be securely fastened in place in a watertight, neat and workmanlike manner. All workmen shall be thoroughly experienced in the particular class of work upon which employed. All work shall be done in accordance with these specifications and shall meet the approval in the field of the Owner's representative. Contractor's representative and/or job supervisor shall have a complete copy of specifications and drawings on job site at all times.

C. Contractor shall plan and conduct the operations of the work so that each section started on one day is complete, details installed and thoroughly protected before the close of work for that day.

D. Where any material is specified by proprietary name, trade name, name of manufacturer, generic name, or catalog number with the addition of such expressions as "or equal"/"or approved equal", it is understood that the material named is intended and no substitution will be allowed without written approval by the Owner's representative three (3) calendar days prior to proposal due date.

E. Should a specified material not be available, a substitution shall require approval (in writing) of the Owner's representative and the roof system manufacturer issuing the warranty before being utilized on this project.

F. Unless otherwise indicated, the materials to be used in this specification are those specified and denote the type, quality, performance, etc. required. All proposals shall be based upon the use of specified material.

G. A Contractor who proposes to quote on the basis of an "or equal"/"or approved equal" alternate material or system shall submit to the Owner's representative the following information, at least five (5) calendar days prior to scheduled proposal opening. Only one request for substitution will be considered for each material or system. When substitution is not accepted, specified product or system shall be used.
   1. A five (5) gallon sample of any adhesive, coating, mastic, or sealant and a three foot by five foot (3' x 5') sample of any sheeting or rolled goods as may be specified.
   2. A certificate from an accredited testing laboratory comparing the physical and performance attributes of the proposed material with those of the specified materials.
   3. A list of at least three (3) local jobs where the proposed alternate material was used under similar conditions and written documentation showing successful installation in the United States of similar size and scope for a minimum of ten (10) years. These jobs must be available for inspection by the Owner's representative.
   4. In the event a substitution is acceptable by the Owner, all contractors shall be notified of the acceptable alternate within three (3) calendar days prior to proposal opening.
   5. During the course of work, the Owner's representative may secure from the containers at the job site, samples of the materials being used and submit the samples to an independent testing laboratory for comparison. If the results of the independent testing laboratory prove that the materials are not comparable and equal to the specified materials, the Contractor shall pay for the testing and the Owner reserves the right to reduce the amount of the proposal by twenty percent (20%) if all work has already been completed before the test results become known. If the contract work is not completed when the test results become known, the Owner shall impose a penalty in proportion to the amount of work already completed, and all remaining work shall be completed with the specified materials.

H. Application of materials shall be in strict accordance with the manufacturer's recommendations. In the instance of a conflict between these specifications and those of the manufacturer, the most stringent shall take precedence.

I. Roofing system manufacturer shall have approval for FM Global wind uplift requirements and shall meet Underwriter's Laboratory fire rating.

J. Roof system shall be installed in accordance with FM Global requirements.

1.12 PROCEDURE FOR USE OF SUBSTITUTION REQUEST FORM

A. Refer to Specification Section 01 33 00 - Submittals and Substitutions for further information.

B. Substitution request **including all required documentation** must be delivered to the Owner's Representative's office no later than the date indicated in the specifications. Requests submitted late will not be considered.

C. The Individual or Firm requesting a substitution must document that the requested substitution is equal or superior to the specified product. Failure to provide clear, accurate, and adequate documentation will be grounds for rejection.

D. Required documentation shall consist of applicable information which would aid the Architect in making an informed decision. Include **side by side product comparisons**, technical data, laboratory test results, product drawings, etc.

E. If use of the proposed product would result in changes to the design of the building, the submittal shall describe fully the changes required to the drawings or specifications. Any cost differences resulting from modifications to the drawings and specifications and the cost of making the changes shall be borne by the Product Supplier.

F. **No** product will be considered "as equal" to the product specified until it has been included as an allowable substitution, in a written Addendum to the project.

1.13 WATERPROOFING

A. All work described in this section shall be performed by a Contractor or Subcontractor who has a proven reputation and expertise in the waterproofing of exterior building surfaces, and in performing all of the types of work described or required for patching, sealing, coating, and waterproofing.

B. The Contractor shall furnish the Owner's representative with satisfactory evidence that he or his Subcontractors have previously been successfully engaged in business as a specialist in the work which he proposes to perform. Such evidence shall include a list of comparable and representative completed projects, project locations, names and addresses of owners and architects or engineers for such projects, and the approximate date at which the work was done.

C. In preparation for this work, the Contractor and any Subcontractors employed by him are expected to visit the site and examine all surfaces and conditions that may affect their work and the warranty required under this contract. All shall especially note the location and extent of existing conditions, and damaged surfaces on the exteriors of the buildings affected. The drawings indicate areas and locations which are representative examples of existing conditions.

D. It is the intent of the drawings and specifications that the new work required will provide a complete weather seal and will prevent the recurrence of water penetration and such damage in the future, at any location in the buildings.

E. The Contractor or his Subcontractors, having special qualifications, expertise, and previous experience (as required in the previous paragraph), shall employ these qualities during initial examination at the site and throughout the execution of the work.

F. The requirements described and stated in the drawings and specifications represent a specific minimum that is required of the Contractor. However, the Contractor, in bidding on and accepting a contract for the work, expressly agrees in advance that this minimum does not limit his responsibility to provide complete waterproofing.

G. In submitting a proposal to the Owner, the Contractor agrees that his responsibility shall include the work described in the drawings and specifications as well as such other leak repairs and/or work as may be required to assure complete waterproofing.

1.14 EXAMINATION OF PREMISES

A. Before submitting proposals for his work, each contractor shall be held to have examined the premises and satisfied himself as to the existing conditions under which he will be obliged to work.

1.15 PROTECTION OF WORK AND PROPERTY

A. Work: The contractor shall maintain adequate protection of all his work from damage and shall protect the Owner's and adjacent property from injury or loss arising from this contract. He shall provide and maintain at all times any OSHA required danger signs, guards, and/or obstructions necessary to protect the public and his workmen from any dangers inherent with or created by the work in progress. All federal, state, and city rules and requirements pertaining to safety and all EPA standards, OSHA standards, NESHAP regulations pertaining to asbestos as required shall be fulfilled by the contractor as part of his bid.

B. Property: Protect existing planting and landscaping as necessary or required to provide and maintain clearance and access to the work of this contract. Examples of two categories or degrees of protection are generally as follows:
   1. Removal, protection, preservation, or replacement and replanting of plant materials.
   2. Protection of plant materials in place, and replacement of any damage resulting from the contractor's operations.

C. Twenty-four Hour Call: The contractor shall have personnel on call twenty-four (24) hours per day, seven (7) days per week for emergencies during the course of a job. The Owner's project manager is to have the twenty-four (24) hour numbers for the contact. Contractor must be able to respond to any emergency call and have personnel on-site within two (2) hours after contact. Numbers available to the Owner's project manager are to be both home and office numbers for:
   1. Job Foreman
   2. Job Superintendent
   3. Owner or Company Officer

1.16 PROTECTION OF PERSONS AND PROPERTY

A. Safety Precautions and Programs: The contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

B. Safety of Persons and Property: The contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to:
   1. Employees on the work and other persons who may be affected thereby.
   2. The work, materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the contractor or the contractor's Subcontractors or Sub-subcontractors.
   3. Other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

C. The contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

D. The contractor shall erect and maintain, as required by existing conditions and performance of the contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

E. The contractor shall comply to all OSHA requirements and any other local, state or federal regulations pertaining to protection and safety of persons or property.

F. The contractor and all Subcontractors shall take all necessary precautions to keep the premises free of fire and safety hazards. The contractor shall prevent all agents, employees, licensees and invitees of the contractor from smoking on the Owner's premises and from operating or using any flame, sparks or explosion hazard producing devices anywhere on or about the premises without the written approval of the Owner's representative.

G. The contractor shall designate a responsible member of the contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the contractor's superintendent unless otherwise designated by the contractor in writing to the Owner's representative.

H. The contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.

1.17 PRE-CONSTRUCTION CONFERENCE

A. A conference shall be scheduled by the Owner's representative and conducted at the work site prior to start of work. The Contractor's project supervisor or foreman and the Owner's representative shall attend. Job schedule, submittals, existing conditions, and specifications shall be reviewed and any questions arising shall be resolved to the satisfaction of all parties prior to start of work. Contractor shall begin work within five (5) calendar days following Owner's signing of contract and/or issuance of the written notice to proceed with work, weather permitting.

1.18 SUBMITTALS

A. To be considered for award of this solicitation, all pages requiring signature plus any/all attachments, must be legible and completed with all requested information, signed and returned sealed in an envelope or other appropriate package adequate to conceal and contain the contents prior to the CSP date and time.

B. Required documents are:

Proposal Form
Conflict of Interest
Felony Conviction Notification
Debarment or Suspension Certification
Senate Bill 9 Contractor Certification Form
Vendor Data Form
Non-Collusion Form
Reference Form
HUB Certification (if applicable)
W-9, Tax Payer Identification Number & Certification
Certification of Regarding Lobbying
Clean Air and Water Act Compliance
Toxic Control Affidavit
HB 89

C. Upon receipt of Notice of Acceptance of this proposal, the Contractor shall submit the following items. All submittals shall be submitted to the Owner/Owner's representative within ten (10) calendar days of the date on the Notice of Acceptance and prior to the award of contract.

1. Contractor's executed insurance certificate.
2. Material manufacturer's approval/acceptance of the specifications and details as written or noted for this project, fastener pattern layout, insulation, fasteners and all related materials.
3. Contractor's executed payment and performance bonds as required.
4. Shop drawings of all perimeter and projection details, and sheet metal details approved by manufacturer, for Owner's approval if proposed details differ from those included with this proposal package. These drawings shall be approved by the membrane manufacturer and submitted at the preconstruction conference for Owner review and approval prior to work start.
5. Approved applicator must submit a roof drawing which will be employed in the project if proposed drawing differs from that included with this proposal package.
6. Shop Drawings and Product Data:
   a) Manufacturer's Details: All termination details and other details normally required by the membrane manufacturer's Technical Specifications, including both standard details and special details, shall be furnished by the Contractor and shall be approved in writing by the manufacturer, the company project manager, and the Owner's representative prior to final installation.

b) As-built Drawings: Contractor shall supply the Owner with a full set of "as-built" drawings depicting location, size, nomenclature and manufacturer of all replaced roof slabs. One set of reproducible drawings, twenty-four inches by thirty-six inches (24" x 36"), shall be supplied along with one set of copies. Contractor shall also supply Owner with "as-built" roofing details as approved by the appropriate manufacturer with original manufacturer's seals and signatures thereon. Owner must have "as-built" drawings in hand prior to release of final payment to the Contractor.

c) Initially submit one reproducible sepia transparency and two prints of each drawing, including fabrication, erection, layout and setting drawings, and other such drawings as required under various sections of the specifications until final approval is obtained.

d) Date and mark shop drawings to show name of project, Owner, Contractor, origination Subcontractor, manufacturer or supplier, and separate details as pertinent.

e) Shop drawings shall completely identify specification sections and locations at which materials or equipment are to be installed.

f) Minimum drawing size shall be eight and one-half inches by eleven inches (8-1/2" x 11").

g) Submit sufficient copies of manufacturer's descriptive data including catalog sheets for materials, equipment and fixtures, showing dimensions, performance characteristics and capacities, diagrams and controls, schedules, and other pertinent information required.

h) Submit brochures and other submittal data that cannot be reproduced economically, in such quantities to allow the Owner to retain four (4) copies of each after review. Mark product data to show the name of project, Owner, Contractor, originating Subcontractor, manufacturer or supplier, and separate details if pertinent.

i) Product data shall completely identify specification sections and locations at which materials or equipment are to be installed.

j) Accompany each submittal with a separate transmittal letter in duplicate, containing date, project title and number, Contractor's name and address, number of each shop drawing, product data and samples submitted, and notification of deviations from Contract Documents.

k) Three sets of prints from the final sepias will be returned to the Owner for record. The cost of printing all sepias and all prints is the responsibility of the Contractor.

7. Detailed project sequencing, staging, material loading, manpower plans, and detailed project construction schedule for approval.
8. Sample of warranty that is to be issued upon project completion.
9. Submit list of all mechanical, electrical, rigging, sheet metal, and other Subcontractors with evidence of Subcontractor's insurance coverage in compliance with contract requirements.
10. Project superintendent's resume and project experience list for proposed system.
11. Contractor shall submit written statement that their company or any Subcontractor they may use is not employing workers classified as undocumented workers on this project.
12. Samples of all materials not supplied or prior approved by the roofing membrane manufacturer shall be submitted to the manufacturer for written approval prior to installation start.

1.19 USE OF PREMISES

A. The Contractor is advised that the Owner will occupy the building at all times, and the Contractor must provide all safeguards required to protect personnel and to keep noise levels as low as reasonably possible for each operation.

B. The Contractor shall:
   1. Coordinate work in such a manner as to not interfere with the normal operation of the building.
   2. Assume full responsibility for protection and safekeeping of products stored on premises.
   3. Agree to hold the Owner harmless in any and all liability of every nature and description that may be suffered through bodily injuries, including death of any persons by reason of negligence of the Contractor, agents, employees, or Subcontractors.
   4. The Contractor and all Subcontractors shall take all necessary precautions to prevent the use of alcoholic beverages on the Owner's premises.
   5. Temporary Sanitary Facilities: The contractor shall furnish and maintain temporary sanitary facilities for employees' use during this project. These will be removed after the completion of the project. All portable facilities shall comply with local laws, codes, and regulations.

1.20 SAFETY

A. The contractor and all Subcontractors shall take all necessary precautions to keep the premises free of fire and safety hazards. The contractor shall prevent all agents, employees, licensees and invitees of the contractor from smoking on the Owner's premises and from operating or using any flame, spark or explosion hazard producing devices anywhere on or about the premises without the written approval of the Owner's representative.

1.21 INSPECTION OF WORK IN PROGRESS

A. The Owner's representative will require the material manufacturer's representative to periodically examine the work in progress, as well as on completion, in order to assist in ascertaining the extent the materials and labor procedures conform to the requirements of the specifications.

B. The authorized material manufacturer's field representative shall be responsible for:
   1. Keeping the Owner's representative informed after periodic inspections as to the progress and quality of the work observed.
   2. Calling to the attention of the Contractor those matters observed which are considered to be in violation of the contract requirements.
   3. Reporting to the Owner's representative, in writing, any failure or refusal of the Contractor to correct unacceptable practices called to his attention.
   4. Confirming, after completion of the work and based on his observation and test, that he has observed no application procedures in conflict with these specifications. Final payment will not be released until all specified warranties have been received by the Owner.

1.22 FIELD INSPECTION AND CONTRACTOR RESPONSIBILITY

A. The Owner's representative shall at all times have access to the job site and work areas. The Contractor will provide proper and safe facilities for such access and inspection.

B. Any time during the course of the project, an inspection may be deemed necessary by the Owner/Owner's representative to have one or all of the following members of the Contractor's organization present in person to inspect the work along with the Owner/Owner's representative: Owner, a Majority Stockholder, President and/or Chief Executive Officer of the contracting firm.

C. The Owner/Owner's representative, if deemed necessary, will notify in writing who in the Contractor's organization they want to inspect the work on the roof in addition to the Contractor's normal inspection. If the designated person or persons requested by the Owner/Owner's representative fails to respond within forty-eight (48) hours to the request, the work may be suspended, payment withheld and/or liquidated damages outlined in the specifications assessed until such time the individual(s) inspect(s) the work with the Owner/Owner's representative.

D. Neither the presence nor absence of the Owner's representative nor the manufacturer's representative, nor an inspection by the manufacturer of the work or operation of the Contractor, nor any failure by the manufacturer to detect, pinpoint, or object to any defect in the work completed, nor any deviation from these specifications, nor the acceptance by the manufacturer of any such defect or the approval of the manufacturer of any such deviation shall relieve the Contractor, or reduce, or in any way limit or divide, his full responsibility for the full performance of the work required of him under these specifications.

E. It shall be understood that such field inspection as the Owner's representative may cause to be performed by the material manufacturer will be performed by the material manufacturer solely for the benefit of the Owner and in an attempt to assist with the requirements of this specification. These requirements bind the Contractor even without such inspection.

F. No inspection or any act or omission of either the Owner's representative or the manufacturer's representative in connection with such inspection shall prejudice the Owner's right to strict conformance, or under any circumstances be construed to excuse or mitigate any mistake or non-conformance by the Contractor.

1.23 ON-SITE SUPERVISION

A. The Contractor is responsible for the management and control of the work. He shall give his personal superintendence of the work or have a competent resident manager or superintendent satisfactory to the Owner on the job site at all times while work is in progress, with full authority to act for the Contractor as his agent.

1.24 CHANGES OR EXTRA WORK

A. No change or addition shall be made except upon receipt by the Contractor of a signed order from the Owner authorizing such a change. No claims for an extra to the contract price shall be valid unless so authorized.

1.25 ROOFTOP EQUIPMENT

A. All air conditioning units and other rooftop equipment shall be moved by the roofing Contractor as required to install roofing materials complete and in accordance with the plans and specifications. When units or equipment are to be moved, they shall be disconnected and moved by the roofing Contractor to a protected area so as not to damage any part or component thereof, and shall be reset by the roofing Contractor and reconnected at the Contractor's expense, all according to local building codes. All disconnection and reconnection shall be performed by a mechanical and/or electrical company licensed to perform such work and approved by the Owner's representative.

B. Contractor shall follow refrigerant recycling requirements as outlined in section 608 of the Clean Air Act, 1990, as amended (CAA), including final regulations published on May 14, 1993 (58 FR 28660), and the prohibition on venting that became effective on July 1, 1992.

C. Where mechanical items, conduits, cables, raceways, piping or any other rooftop mounted item must be moved in any manner, or disconnected and reconnected as made necessary by the reroofing of the specified areas at the facility, all rooftop equipment, piping, insulation, wires, fiber optic cable, any information systems components, conduits, panels, motor starters, raceways, switches, antennas, satellite components, etc. shall be replaced or renewed to match existing if damaged by Contractor. NOTE: It is the responsibility of the Contractor to review the condition of any and all of the above noted, or similar, items with authorized Owner personnel to determine condition of said items PRIOR TO START OF WORK. If this review is not completed as prescribed, any and all damage found at the end of the work will be repaired solely at the contractor's expense.

D. Any action by roofing contractor personnel which causes interruption of the ongoing works of the Owner's facility will be repaired at the sole expense of the roofing contractor. Upon interruption of the Owner's ability to meet required tasks, Owner may immediately, and without the contractor's permission, take such action as necessary to repair said damage so that the Owner's work may be resumed. The Owner has the obligation to notify the contractor of such action as soon as possible, but in all cases must notify the contractor in writing within 48 hours of the occurrence of the incident.

1.26 FINAL INSPECTION

A. Upon job completion, a final inspection will be made by Owner's representative. Final payment will not be authorized for the work done until such inspection has been made and all work is found to have been performed in accordance with the specifications and to the satisfaction of the building Owner, and the specified warranties are issued.

B. The Contractor shall promptly remove any work that does not meet the requirements of the plans and specifications or is incorrectly installed or otherwise disapproved by the Owner as failing to meet with the plans and specifications. The Contractor shall promptly replace any such work without expense to the Owner and shall bear the cost of making good all work of other contractors or the Owner, destroyed or damaged by such removal or replacement.

1.27 PERMITS

A. The Contractor shall obtain and pay for all permits required, give all legal notices and pay all fees required for the work. Contractor shall comply with all ordinances and laws. Any and all work done which does not meet requirements of any local authorities must be properly redone, and incidental work replaced by the Contractor, without cost to the Owner.

1.28 SUBCONTRACTING OF WORK

A. The Owner shall have the right to accept or reject the use of any subcontractor. The Contractor shall submit a list of proposed Subcontractors with his proposal.

1.29 REJECTION OF PROPOSALS

A. The Owner reserves the right to reject any one or all proposals, to waive any formalities or irregularities, and to award the contract in the best interest of the School District.

1.30 SELECTION CRITERIA FOR QUALIFYING ROOFING PROPOSALS

A. It is not the policy of the School District to purchase on the basis of low price alone

B. In evaluating bids/proposals submitted and per the Texas Education Code 44.031(b), the following considerations shall be taken into account to determine the best value for the District:

EVALUATION CRITERIA	POINT VALUE
Purchase Price	40
Reputation of the vendor and vendor's goods or services	10
Quality of the vendor's goods or services	20
Extent to which the goods or services meet the district's needs	15
Vendor's past relationship with the district	3
Impact of district's compliance with laws and rules relating to Historically Underutilized Businesses (Attach Certificate if applicable)	2
Total long-term cost to the district	5
Other relevant factors specifically listed in this CSP	5
Total Points	100

1.31 ADDENDA

A. Any verbal statement or inference prior to the proposal opening regarding modification of specifications is invalid unless so stated on an officially issued addendum.

1.32 DEMOLITION

A. All abandoned pitch pans, equipment, vents, curbs, and other such debris shall be removed by the Contractor. Abandoned items that require deck placement shall be marked by the Owner prior to proposal due date and/or the commencement of work. Contractor shall install new decking of like dimensions to provide a suitable substrate in areas where penetrations through the deck are removed.

1.33 CREWS AND EQUIPMENT

A. Contractor shall provide sufficient crews and equipment so that the project may progress without interruption or unnecessary delay.

1.34 FUTURE REPAIRS

A. Contractor certifies by acceptance of this project that any future repairs or alterations he might be called upon to execute after the project is complete, will be performed in accordance with the manufacturer's recommended procedures so as to not void the warranty.

1.35 NAILERS AND ROOF DECK

A. Contractor shall notify the Owner's representative of unforeseen areas of damaged decking, wet insulation, wet fill material or deteriorated nailers. Where the damage is serious and extensive, it will be the Owner's prerogative to authorize removal and replacement.

B. Any areas of unusual deck deflection noticed by the Contractor during the course of the job that will cause an area of ponding water should be brought to the attention of the Owner's representative by the Contractor.

C. The Contractor shall furnish the Owner with a unit price for removal and replacement of the damaged decking, wet insulation, wet fill material or deteriorated nailers. All nailers required for the new roofing application shall be provided by the roofing Contractor, and included in the proposal amount. Unit cost for nailers applies only to existing deteriorated nailers. If lumber is required to make "flush" interior parapet wall, cost shall be included in Base Proposal.

1.36 CONTRACT DOCUMENTS

A. In the event of a conflict between the roofing specifications and the Owner's contract documents, the Owner's contract documents shall take precedence.

END OF SECTION 01 10 00

SECTION 01 21 13
CASH ALLOWANCES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included: To provide adequate budget and bonding to cover items not precisely determined prior to bidding, allow within the proposed Contract Sum the amounts described below.

B. Related Work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 01 of these Specifications.
2. Other provisions concerning Cash Allowances also may be stated in other Sections of these Specifications.

C. All work to be performed from any contingency fund must be approved in writing from Owner/Project Manager prior to work commencing.

1.02 SPECIFIC CASH ALLOWANCES

A. Allow the sum of $25,000.00 for General Contingency, for Bid Item 1A – Service Center Annex as dictated by the Consultant and Owner.

B. Allow the sum of $25,000.00 for General Contingency, for Bid Item 1B –McMath Middle School as dictated by the Consultant and Owner.

END OF SECTION 01 21 13

SECTION 01 26 63
CHANGE ORDER PROCEDURES

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

A. Procedures for processing Change Orders.

1.02 SUBMITTALS

A. Submit name of the individual authorized to accept changes, and to be responsible for informing others in contractor's employ of changes in the work.

B. Change Order Forms: AIA G701

1.03 DOCUMENTATION OF CHANGE IN CONTRACT SUM AND CONTRACT TIME

A. Maintain detailed records of work done on a time and material basis.

1. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the work.

B. Document each quotation for a change in costs or time with sufficient data to allow evaluation of the quotation.

C. Provide data necessary to support computations:

1. Quantities of products, labor, and equipment.
2. Insurance and bonds.
3. Labor burden for labor on a change will be established at 46% maximum allowed of labor cost. Labor burden is to include the cost FICA, workers compensation, state and federal unemployment, and health insurance.
4. Justification for any change in contract time.
5. Credit for deletions from contract, similarly documented.

D. Support each claim for additional costs, and for work done on a time and material basis with additional information:

1. Origin and date of claim. Note: Claims for additional cost must be submitted within 10 days of claim to be considered.
2. Dates and times work was performed, and by whom.
3. Time records and wage rates paid.
4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

1.04 CONSTRUCTION CHANGE AUTHORIZATION

A. Consultant/Owner may issue a directive, signed by the Owner, instructing contractor to proceed with a change in the work, for subsequent inclusion in a Change Order.

B. Directive will describe changes in the work, and will designate method of determining any change in contract sum or contract time.

C. Promptly execute the change in work.

1.05 LUMP SUM CHANGE ORDER

A. Will be based on proposal request and contractor's sum quotation, or contractor's request for Change Order as approved by Consultant/Owner.

B. Contractor's overhead and profit shall not exceed 10% of the lump sum cost including bonds and insurance.

1.06 UNIT PRICE CHANGE ORDER

A. For predetermined unit prices and quantities, Change Order will be executed on a lump sum basis.

B. For unit costs or quantities of units of work that are not predetermined, execute work under a construction change authorization.

1. Changes in contract sum or contract time will be computed as specified for time and material Change Order.

C. Contractor's overhead and profit shall not exceed 10% of the unit price cost including bonds and insurance.

1.07 TIME AND MATERIAL CHANGE ORDER

A. Submit itemized account and supporting data after completion of change.

B. Consultant/Owner will determine the change allowable in contract sum and contract time.

C. Contractor's overhead and profit shall not exceed 10% of the total of the time and material cost including bonds and insurance.

1.08 EXECUTION OF CHANGE ORDERS

A. Consultant/Owner will issue Change Orders for signatures of parties.

1.09 CORRELATION OF CONTRACTOR SUBMITTALS

A. Promptly revise schedule of values and application for payment forms to record each authorized Change Order as a separate line time and adjust the contract sum as shown on the Change Order.

B. Promptly revise progress schedules to reflect any change in contract time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

END OF SECTION 01 26 63

SECTION 01 32 33
PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for the following:
   1. Preconstruction photographs.
   2. Periodic construction photographs.
   3. Final Completion construction photographs.

1.02 SUBMITTALS

A. Construction Photographs: Submit one print of each photographic view within ten (10) days of taking photographs. Submission shall be on 8.5" by 11" paper, printed two photographs per page.
   1. Identification:
      a) Below each print, provide a description of the view.
      b) **Date photograph was taken shall be stamped by camera with the exception of Final Completion Construction Photographs.**
   2. Digital Images: With each submittal of prints also submit a complete set of digital image electronic files on CD-ROM or flash drive.

PART 2 - PRODUCTS

2.01 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in uncompressed JPEG format, produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than 1024 by 768 pixels.

PART 3 - EXECUTION

3.01 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the work. Photographs with blurry or out-of-focus areas will not be accepted.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
   1. Field Office Images: Maintain one set of images on CD-ROM or flash drive in the field office at project site, available at all times for reference.

C. Preconstruction Photographs: Before commencement of demolition, take digital photographs of project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Project Manager.

1. Take ten (10) photographs per facility to show existing conditions of property before starting the work.
2. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.

D. Periodic Construction Photographs: Take minimum twenty (20) digital photographs per facility weekly, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

E. Project Manager-Directed Construction Photographs: From time to time, Project Manager will instruct photographer about number and frequency of additional digital photographs with general directions on vantage points to show the status of construction and progress since last photographs were taken.

F. Final Completion Construction Photographs: Take ten (10) digital photographs per facility after date of Substantial Completion for submission as Project Record Documents. Project Manager will direct photographer for desired vantage points.
1. **Do not include date stamp.**

END OF SECTION 01 32 33

SECTION 01 33 00
SUBMITTALS AND SUBSTITUTIONS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work includes: Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements.
   1. Throughout the Work, seal and caulk joints where shown on the Drawings and/or as required by the Project Manager to provide and maintain watertight and airtight continuous seals.

1.02 QUALITY ASSURANCE

A. Coordination of submittals:
   1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
   2. Verify that each item and the submittal for it conform in all respects with the specified requirements.
   3. By affixing the Contractor's signature to each submittal, certify that this coordination has been performed.

B. Substitutions
   1. The contract is based on the standards of quality established in the Contract Documents. Substitutions will be considered only when listed at time of bidding, on the form provided in the bidding documents, and when substantiated by the Contractor's submittal of required data within thirty-five (35) calendar days after award of the Contract.
   2. The following products do not require further approval except for interface within the work:
      a. Products specified by reference to standard specifications such as ASTM and similar standards.
      b. Products specified by manufacturer's name and catalog model number.
   3. Where any material is specified by proprietary name, trade name, name of manufacturer, generic name, or catalog number with the addition of such expressions as "or equal"/"or approved equal", it is understood that the material named is intended and no substitution will be allowed without written approval by the Owner's representative three (3) calendar days prior to proposal due date.
   4. Should a specified material not be available, a substitution shall require approval (in writing) of the Owner's representative and the roof system manufacturer issuing the warranty before being utilized on this project.
   5. Unless otherwise indicated, the materials to be used in this specification are those specified and denote the type, quality, performance, etc. required. All proposals shall be based upon the use of specified material.
   6. Do not substitute materials, equipment, or methods unless substitution has been specifically approved in writing for this work by the Project Manager.

C. "Or equal"
1. Where the phrase "or equal", or "or equal as approved by the Project Manager", occurs in the Contract Documents, do not assume that the materials, equipment, or methods will be approved as equal unless the item has been specifically so approved for this work by the Project Manager.
2. A Contractor who proposes to quote on the basis of an "or equal"/"or approved equal" alternate material or system shall submit to the Owner's representative the following information, at least five (5) calendar days prior to scheduled proposal opening. Only one request for substitution will be considered for each material or system. When substitution is not accepted, specified product or system shall be used.
   a) A five (5) gallon sample of any adhesive, coating, mastic, or sealant and a three foot by five foot (3' x 5') sample of any sheeting or rolled goods as may be specified.
   b) A certificate from an accredited testing laboratory comparing the physical and performance attributes of the proposed material with those of the specified materials.
   c) A list of at least three (3) local jobs where the proposed alternate material was used under similar conditions and written documentation showing successful installation in the United States of similar size and scope for a minimum of ten (10) years. These jobs must be available for inspection by the Owner's representative.
   d) In the event a substitution is acceptable by the Owner, all contractors shall be notified of the acceptable alternate within three (3) calendar days prior to proposal opening.
   e) During the course of work, the Owner's representative may secure from the containers at the job site, samples of the materials being used and submit the samples to an independent testing laboratory for comparison. If the results of the independent testing laboratory prove that the materials are not comparable and equal to the specified materials, the Contractor shall pay for the testing and the Owner reserves the right to reduce the amount of the proposal by twenty percent (20%) if all work has already been completed before the test results become known. If the contract work is not completed when the test results become known, the Owner shall impose a penalty in proportion to the amount of work already completed, and all remaining work shall be completed with the specified materials.

D. Procedure for Use of Substitution Request Form
1. Substitution request **including all required documentation** must be delivered to the Owner's Representative's office no later than the date indicated in the specifications. Requests submitted late will not be considered.
2. The Individual or Firm requesting a substitution must document that the requested substitution is equal or superior to the specified product. Failure to provide clear, accurate, and adequate documentation will be grounds for rejection.
3. Required documentation shall consist of applicable information which would aid the Project Manager in making an informed decision. Include **side by side product comparisons**, technical data, laboratory test results, product drawings, etc.

4. If use of the proposed product would result in changes to the design of the building, the submittal shall describe fully the changes required to the drawings or specifications. Any cost differences resulting from modifications to the drawings and specifications and the cost of making the changes shall be borne by the Product Supplier.
5. **No** product will be considered "as equal" to the product specified until it has been included as an allowable substitution, in a written Addendum to the project.

1.03 SUBMITTALS

A. Make submittals of Shop drawings, samples, Substitution Requests, and other items in accordance with the provisions of this section.

B. Upon receipt of Notice of Acceptance of this proposal, the Contractor shall submit the following items. All submittals shall be submitted to the Owner/Owner's representative within ten (10) calendar days of the date on the Notice of Acceptance and prior to the award of contract.
1. Contractor's executed insurance certificate.
2. Material manufacturer's approval/acceptance of the specifications and details as written or noted for this project, fastener pattern layout, insulation, fasteners and all related materials.
3. Contractor's executed payment and performance bonds as required.
4. Shop drawings of all perimeter and projection details, and sheet metal details approved by manufacturer, for Owner's approval if proposed details differ from those included with this proposal package. These drawings shall be approved by the membrane manufacturer and submitted at the preconstruction conference for Owner review and approval prior to work start.
5. Approved applicator must submit a roof drawing which will be employed in the project if proposed drawing differs from that included with this proposal package.
6. Detailed project sequencing, staging, material loading, manpower plans, and detailed project construction schedule for approval.
7. Sample of warranty that is to be issued upon project completion.
8. Submit list of all mechanical, electrical, rigging, sheet metal, and other Subcontractors with evidence of Subcontractor's insurance coverage in compliance with contract requirements.
9. Project superintendent's resume and project experience list for proposed system.
10. Contractor shall submit written statement that their company or any Subcontractor they may use is not employing workers classified as undocumented workers on this project.
11. Samples of all materials not supplied or prior approved by the roofing membrane manufacturer shall be submitted to the manufacturer for written approval prior to installation start.
12. Submit waterproofing product data, including detailed test results of material applied to surfaces similar to requirements of this Section. Submit manufacturer's instructions for methods and application procedures.

C. Samples and Manufacturer's Submittals: Submit prior to delivery or installation.
1. Samples of all roofing system components including all specified accessories.
2. Submit samples of proposed warranty complete with any addenda necessary to meet the warranty requirements as specified.

3. Submit latest edition of manufacturer's specifications and installation procedures. Submit only those items applicable to this project.
4. A written statement from the roofing materials manufacturer approving the installer, specifications and drawings as described and/or shown for this project and stating the intent to guarantee the completed project.
5. Manufacturer's Equiviscous Temperatures (EVT) for the specified bitumens.
6. Submit shop drawings, product data and mockups of all sheet metal.

D. Samples and Manufacturer's Submittals for Sheet Metal and Miscellaneous Accessories: Submit prior to deliver or installation.
1. Submit shop drawings, product data and mockups of all sheet metal.

PART 2 – PRODUCTS

2.01 SHOP DRAWINGS

A. Scale and measurements: Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the work.

B. Shop Drawings: Provide manufacturer's approved details of all perimeter conditions, projection conditions, and any additional special job conditions which require details other than indicated in the drawings.

C. Shop Drawings and Product Data:
1. Manufacturer's Details: All termination details and other details normally required by the membrane manufacturer's Technical Specifications, including both standard details and special details, shall be furnished by the Contractor and shall be approved in writing by the manufacturer, the company project manager, and the Owner's representative prior to final installation.
2. As-built Drawings: Contractor shall supply the Owner with a full set of "as-built" drawings depicting location, size, nomenclature and manufacturer of all replaced roof slabs. One set of reproducible drawings, twenty-four inches by thirty-six inches (24" x 36"), shall be supplied along with one set of copies. Contractor shall also supply Owner with "as-built" roofing details as approved by the appropriate manufacturer with original manufacturer's seals and signatures thereon. Owner must have "as-built" drawings in hand prior to release of final payment to the Contractor.
3. Initially submit three prints of each drawing, including fabrication, erection, layout and setting drawings, and other such drawings as required under various sections of the specifications until final approval is obtained.
4. Date and mark shop drawings to show name of project, Owner, Contractor, origination Subcontractor, manufacturer or supplier, and separate details as pertinent.
5. Shop drawings shall completely identify specification sections and locations at which materials or equipment are to be installed.
6. Minimum drawing size shall be eight and one-half inches by eleven inches (8-1/2" x 11").

7. Submit sufficient copies of manufacturer's descriptive data including catalog sheets for materials, equipment and fixtures, showing dimensions, performance characteristics and capacities, diagrams and controls, schedules, and other pertinent information required.
8. Submit brochures and other submittal data that cannot be reproduced economically, in such quantities to allow the Owner to retain one copy of each after review. Mark product data to show the name of project, Owner, Contractor, originating Subcontractor, manufacturer or supplier, and separate details if pertinent.
9. Product data shall completely identify specification sections and locations at which materials or equipment are to be installed.
10. Accompany each submittal with a separate transmittal letter in duplicate, containing date, project title and number, Contractor's name and address, number of each shop drawing, product data and samples submitted, and notification of deviations from Contract Documents.
11. One (1) set of prints and will be returned to the Owner for record. The cost of all printing is the responsibility of the Contractor.

D. Provide manufacturer's approved details, or all perimeter conditions, project conditions, and any additional special job conditions which require details other than indicated in the drawings.

E. Types of prints required: Submit Shop Drawings in the form of six (6) bond prints of each sheet.

F. Review comments of the Project Manager will be shown on the copies when it is returned to the Contractor. The Contractor may make and distribute marked copies as are required for his purposes.

G. Fax submittals **are not acceptable**.

2.02 MANUFACTURER'S LITERATURE

A. Where contents of submitted literature from manufacturers includes data not pertinent to the submittal, clearly show which portions of the contents is being submitted for review.

B. Submit the number of copies which are required to be returned, plus one copy which will be retained by the Project Manager.

2.03 MAINTENANCE PROCEDURES

A. Maintenance Procedures: Within ten days of the date of Substantial Completion of the project, deliver to the Owner three copies of the manufacturer's printed instructions regarding care and maintenance of the roof.

2.04 SAMPLES

A. Provide sample or samples identical to the precise article proposed to be provided. Identify as described under "Identification of Submittals" below.

B. Number of samples required:

1. Unless otherwise specified, submit samples in the quantity which is required to be returned, plus one which will be retained by the Project Manager.
2. By pre-arrangement in specific cases, a single sample may be submitted for review and, when approved, be installed in the work at a location agreed upon by the Project Manager.

2.05 COLORS AND PATTERNS

A. Unless the precise color and pattern are specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Project Manager for selection.

B. Contractor shall hold **ALL** color samples until all items requiring color selections are received. **Only** then should the actual color samples be submitted for selections. Each sample shall be properly labeled with the name of the project, contractor, manufacturer, and date of submission. Incomplete color submittal **will be** returned to the Contractor.

C. The Contractor shall allow four weeks **after all** colors are submitted for final Owner approval.

PART 3 – EXECUTION

3.01 IDENTIFICATION OF SUBMITTALS

A. Consecutively number all submittals.

B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.
1. When material is re-submitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
2. On re-submittals, cite the original submittal number for reference.

C. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.

D. Maintain an accurate submittal log for the duration of the work, showing current status of all submittals at all times. Make the submittal log available to the Project Manager for his review upon request.

3.02 TIMING OF SUBMITTALS

A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and re-submittals, and for placing orders and securing delivery.

B. Revisions:
   1. Make revisions required by the Project Manager.
   2. If the Contractor considers any required revision to be a change, he shall so notify the Project Manager.
   3. Make only those revisions directed or approved by the Project Manager.

END OF SECTION 01 33 00

SECTION 01 42 13
ARCHITECTURAL ABBREVIATIONS AND SYMBOLS

PART 1 - GENERAL

1.01 SCOPE

A. This section describes abbreviations and how they are used in these specifications and on the approved drawings.

1.02 DESCRIPTION

A. When references are made in these specifications to the standards, specifications, or other published data of various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only.

B. Abbreviations can have more than one meaning. The abbreviation shall be considered with respect to different disciplines where the context in which each is used makes the meaning clear.

1.03 QUALITY ASSURANCE

A. In case of conflict between abbreviations, or between abbreviations and symbols, most stringent requirement shall govern.

B. Discrepancies and conflicts shall be noted and brought to the Project Manager's attention for interpretation and clarification.

1.04 LIST OF ABBREVIATIONS

@	At
A/C	Air Conditioning
ABV	Above
ACOUST	Acoustical
ADD	Addendum
ADH	Adhesive
ADJ	Adjustable
ADJC	Adjacent
AFF	Above finish floor
AGG	Aggregate
AHU	Air Handling Unit
ALT	Alternate
ALUM	Aluminum
ANOD	Anodized
APPROX	Approximate
ARCH	Architect/Architectural
ASPH	Asphalt
AUD	Auditorium
BBD	Bulletin Board
BD	Board
BEL	Below
BET	Between
BFF	Below finish floor
BIT	Bituminous
BLDG	Building
BLK	Block
BLKG	Blocking
BM	Beam
BM	Bench Mark
BOT	Bottom
BRG	Bearing
BRK	Brick
BSMT	Basement
BUR	Built-up Roof
BW	Both Ways
CAB	Cabinet
CAD	Cadmium
CEM	Cement
CER	Ceramic
CFL	Counterflashing
CFMF	Cold Formed Metal Framing
CFT	Cubic Foot

CHBD	Chalkboard
CHT	Ceiling Height
CIR	Circle
CJ	Control Joint
Cl	Cast Iron
CLG	Ceiling
CLR	Clear Dimension
CLST	Closet
CM-TILE	Ceramic Mosaic Tile
CMU	Concrete Masonry Unit
COL	Column
COMP	Compress(ed)(ion)(ible)
CONC	Concrete
CONST	Construction
CONT	Continuous
CORR	Corridor
CPT	Carpet(ed)
CR	Cold Rolled
CRS	Course(s)
CS	Carpet Strip
CT	Ceramic Tile
CY	Cubic Yard
D	Depth
DEM	Demolish, Demolition
DEPT	Department
DF	Drinking Fountain
DIA	Diameter
DIM	Dimension
DMPF	Dampproofing
DN	Down
DR	Door
DS	Downspout
DWG	Drawing
DWL	Dowels
DWR	Drawer
E	East
EA	Each
EIFS	Exterior Insulation and Finish
EJ	Expansion Joint
ELEC	Electrical
ELEV	Elevation, Elevator
EOD	Emergency Overflow Drain
EOS	Emergency Overflow Scupper
EPO	Emergency Power Off
EQ	Equal
EQUIP	Equipment
EST	Estimate
EWC	Electric Water Cooler
EXH	Exhaust
EXIST	Existing
EXP	Exposed
EXT	Exterior
FB	Face Brick
FD	Floor Drain
FE	Fire Extinguisher
FEC	Fire Extinguisher Cab.
FECR	Fire Extinguisher Cab. Rated
FHC	Fire Hose Cabinet
FIN FL	Finish Floor
FIN	Finish(ed)
FL	Floor
FLG	Flashing
FLUOR	Fluorescent
FLX	Flexible
FO	Face of
FOF	Face of Finish
FOM	Face of Masonry
FOS	Face of Studs
FR	Frame
FS	Federal Specification
FT	Foot, Feet
FTG	Footing
FUR	Furring
FURR-DN	Furrdown
FUT	Future
FVC	Fire Valve Cabinet
GA	Gage, Gauge
GALV	Galvanized
GB	Grab Bar
GL	Glass, Glazing
GVL	Gravel
GYP.BD.	Gypsum Board
HB	Hose Bibb
HC	Handicapped
HDW	Hardware
HDWD	Hardwood
HM	Hollow Metal
HORIZ	Horizontal
HR	Hour
HT	Height
HTG	Heating
HVAC	Heating/Ventilation/AC
HWH	Hot Water Heater
IN	Inch
INCAND	Incandescent
INCL	Include(d)(ing)
INSTRU	Instruments
INSUL	Insulation
INT	Interior
INTM	Intermediate
INV	Invert
JAN	Janitor
JF	Joint Filler
JST	Joist
JT	Joint
KIT	Kitchen

KPL	Kick Plate
L	Length
LAB	Laboratory
LAD	Ladder
LAM	Laminated
LAV	Lavatory
LH	Left Hand
LICLG	Lay-in Ceiling
LOC	Location
LPT	Low Point
LT	Light
LTWT	Lightweight
LVR	Louver
MAS	Masonry
MATL	Material
MAX	Maximum
MECH	Mechanical
MED	Medium
MEMB	Membrane
MFD	Manufactured
MFR	Manufacturer
MH	Manhole
MIL	Thousandth Inch
MIN	Minimum
MIR	Mirror
MISC	Miscellaneous
MO	Masonry Opening
MT	Mount(ed)(ing)
MTL	Metal
MULL	Mullion
N	North
NAT	Natural
NELMA	Northeastern Lumber Manufacturers Association
NIC	Not in Contract
NL	Nailable
NLGA	National Lumber Grades Authority
NO	Number
NOM	Nominal Dimension
NPA	National Particleboard Association
NRC	Noise Reduction Coefficient
NTS	Not to Scale
O.C.	On Center
O.C.E.W.	On Center Each Way
OA	Overall
OBS	Obscure
OH	Overhead
OPNG	Opening
OPP	Opposite
OPP.HAND	Opposite Hand
P.LAM	Plastic Laminate
PAR	Parallel
PART'N	Partition
PCF	Pound per Cubic Foot
PERIM	Perimeter
PKG	Parking
PL	Plate
PLAS	Plaster
PLAS.LAM	Plastic Laminate
PLBG	Plumbing
PLUMB	Plumbing
PLYWD	Plywood
PNL	Panel
PR	Pair
PROJ	Projection
PROP	Property
PSF	Pounds per Square Foot
PSI	Pounds per Square Inch
PTD	Painted
PVC	Polyvinyl Chloride
PVMT	Pavement
Q-TILE	Quarry tile
R	Radius, Riser
R/A	Return Air
RCP	Reinforced Concrete Pipe
RD	Roof Drain
RE:	Reference
REFL	Reflected
REFR	Refrigerator
REG	Register
REINF	Reinforcing
REM	Remove
REQ'D	Required
RET	Return
REV	Revision, Revised
RFH	Roof Hatch
RM	Room
RO	Rough Opening
ROW	Right of Way
S	South
SC	Solid Core
SCHED	Schedule
SCWD	Solid Core Wood Door
SECT	Section
SHT	Sheet
SHTH	Sheathing
SIM	Similar
SKL	Skylight
SL	Sleeve
SNT	Sealant
SPCL	Special
SPEC	Specification
SPIB	Southern Pine Inspection Bureau

SPK	Speaker
SPKLR	Sprinkler
SQ	Square
SS	Stainless Steel
STD	Standard
STL	Steel
STOR	Storage
STRUC	Structure, Structural
SUSP	Suspended
SYM	Symmetr(y)(ical)
SYST	System
T & G	Tongue and Groove
T	Tread
T.O.B.	Top of Beam
T.O.J.	Top of Joist
T.O.S.	Top of Steel
T.O.SL.	Top of Slab
TA	Toilet Accessories
TB	Towel Bar
TC	Top of Curb
TEL	Telephone
TEMP	Temporary
TEMP.GL	Tempered Glass
TERR	Terrazo
THK	Thick(ness)
THRESH	Threshold
TKBD	Tackboard
TKS	Tackstrip
TOL	Tolerance
TV	Television Outlet
TYP	Typical
UL	Underwriter's Laboratories
UNO	Unless Noted Otherwise
UR	Urinal
VB	Vapor Barrier
VCT	Vinyl Composition Tile
VERT	Vertical
VIN	Vinyl
VNR	Veneer
VWC	Vinyl Wall Covering
W	West
W	Width
W/	With
W/O	Without
WC	Water Closet
WCLIB	West Coast Lumber Inspection Bureau
WD	Wood
WG	Wire Glass
WH	Wall Hung
WP	Waterproofing
WPT	Working Point
WWF	Welded Wire Fabric
WWPA	Western Wood Products Association

PART 2 - PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION 01 42 13

SECTION 01 78 00
PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 SUMMARY

A. This section specifies administrative and procedural requirements for project closeout, including but not limited to:
   1. Observation procedures
   2. Project record document submittal
   3. Operating and maintenance manual submittal
   4. Submittal of warranties
   5. Final cleaning

1.02 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting observation for certification of Substantial Completion, complete the following. List exceptions in the request.
   1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show one hundred percent (100%) completion for the portion of the work claimed as substantially complete. Include supporting documents for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
   2. If one hundred percent (100%) completion cannot be shown, include a list of incomplete items, the value of incomplete construction and reasons the work is not complete.
   3. Advise Owner of pending insurance change-over requirements.
   4. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
   5. Obtain and submit releases enabling the Owner unrestricted use of the work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
   6. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey and similar final record information.
   7. Deliver tools, spare parts, extra materials and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable. Extra materials include but are not necessarily limited to those listed in the "Summary of Extra Materials" following this section.
   8. Make final change-over of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of change-over in security provisions.
   9. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups and similar elements.

B. Observation Procedures: On receipt of a request for observation, the Project Manager will either proceed with observation or advise the Contractor of unfilled requirements. The Project Manager will prepare the Certificate of Substantial Completion following observation, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Project Manager will repeat observation when requested, and be assured by the Contractor in writing, that the work has been substantially completed.
2. Results of the completed observation will form the basis of requirements for final acceptance.

1.03 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final observation for certification of final acceptance and final payment, complete the following. List exceptions in the request.
   1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
   2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
   3. Submit a certified copy of the Project Manager's final observation list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Project Manager.
   4. Submit consent of surety to final payment.
   5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   6. Complete final clean up requirements, including touchup painting. Touchup and otherwise repair and restore marred exposed finishes.

B. Re-observation Procedure: The Project Manager will re-observe the work upon receipt of notice that the work, including observation list items from earlier observations, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Project Manager.
   1. Upon completion of re-observation, the Project Manager will prepare a certificate of final acceptance, or advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
   2. If necessary, re-observation will be repeated.
   3. Should the Project Manager perform re-observations, due to failure of the work to comply with the claims of status of completion made by the Contractor, the Owner shall compensate the Project Manager for additional services; and the Owner shall deduct the amount of the compensation from the final payment to the Contractor.

1.04 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Project Manager's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with colored erasable pencil, and use other colors to distinguish between variations in separate categories of the work. Use the following color code:
   a) Red for Architectural work
   b) Blue for Structural work
   c) Green for Plumbing work
   d) Orange for HVAC work
   e) Brown for Electrical work
   f) Black for other written notations
2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
3. Note related Change Order numbers where applicable.
4. At completion of project, transfer all Project Record Data to one complete set of mylar sepias using mylar compatible colored pencils or ink. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set. Deliver one complete set of mylar sepias of all drawings to the Project Manager for the Owner's records. The cost of printing the mylar sepias shall be paid by the Contractor.

C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.
   1. Upon completion of the work, submit record Specifications to the Project Manager for the Owner's records.

D. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in the actual work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.
   1. Upon completion of mark-up, submit complete set of record Product Data to the Project Manager for the Owner's records.

E. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Project Manager and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.

F. Miscellaneous Record Submittals: Refer to other Specification sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Project Manager for the Owner's records.

G. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty two inch (2"), three-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:
   1. Emergency instructions
   2. Spare parts list
   3. Copies of warranties
   4. Wiring diagrams
   5. Recommended "turn around" cycles
   6. Observation procedures
   7. Shop Drawings and Product Data
   8. Fixture lamping schedule

PART 2 - PRODUCTS

2.01 CLEANING AGENTS

A. Use cleaning materials and agents recommended by the manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property, or that might damage finished surfaces.

PART 3 - EXECUTION

3.01 CLOSEOUT PROCEDURES

A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:
   1. Maintenance manuals
   2. Record documents
   3. Spare parts and materials
   4. Hazards
   5. Cleaning
   6. Warranties and bonds
   7. Maintenance agreements and similar continuing commitments

3.02 FINAL CLEANING

A. General: General cleaning during construction is required by the General Conditions and included in "Temporary Facilities" section.

B. Cleaning: Employ experienced cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
   1. Complete the following cleaning operations before requesting Certification of Substantial Completion.

2. Remove labels that are not permanent labels.
3. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
4. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
5. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
6. Clean the site, including landscape development areas, of rubbish, litter and foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

C. Removal of Protection: Remove temporary protection and facilities installed for protection of the work during construction.

D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials to the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
   1. Where extra materials of value remaining after completion of associated work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION 01 78 00

SECTION 04 05 00
BASIC MASONRY MATERIALS AND METHODS

PART 1 – GENERAL

1.01 SUMMARY

A. Related Documents: General and Supplementary Conditions of the Contract, Division 1 General Requirements, and Drawings are applicable to this Section.

B. Section Includes, but is not limited to:
   1. Basic masonry methods for masonry
   2. Mortar for masonry
   3. Metal connectors and reinforcement
   4. Masonry mortar dropping collection system
   5. Weep hole vents

1.02 REFERENCES (INCLUDING LATEST REVISIONS)

A. American Society for Testing and Materials (ASTM):
   1. A615/A615M – Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Replacement
   2. A951 – Standard Specification for Masonry Joint Reinforcement
   3. C 143/C-143M – Standard Test Method for Slump of Hydraulic Cement Concrete
   4. C 144 – Standard Specification for Aggregate for Masonry Mortar
   5. C 150 – Standard Specification for Portland Cement
   6. C 207 – Standard Specification for Hydrated Lime for Masonry Purposes
   7. C 270 – Standard Specification for Mortar for Unit Masonry
   8. C 404 – Standard Specification for Aggregate for Masonry Grout
   9. C 476 – Standard Specification for Grout for Masonry
   10. C 595 – Standard Specification for Blended Hydraulic Cement
   11. C 1019 – Standard Method of Sampling and Testing Grout
   12. C 1157 – Standard Performance for Hydraulic Cement

B. Industry Association Standards:
   1. National Concrete Masonry Association
      a) NCMA TR-88 Hot & Cold Weather Masonry Construction Manual
   2. Brick Industry Association (BIA)
   3. American Concrete Institute (ACI)
      a) ACI 318 Building Code Requirements for Structural Concrete

1.03 SUBMITTALS

A. Shop drawings, product data, and samples under provisions of Section 01 33 00.

B. Product Data:
   1. Bulk Mortar and Grout
      a) Mixing and preparation instructions and recommendations
      b) Storage and handling requirements and recommendations
      c) Installation methods

2. Metal Connectors and reinforcement
   a) Include descriptive data, product attributes and performance characteristics.
3. Masonry Mortar Dropping Collection System
   a) Include descriptive data, product attributes and performance characteristics.
4. Weep hole Vents
   a) Include descriptive data, product attributes and performance characteristics.

C. Quality Assurance/Control Submittals: Design Data, Test Reports:
1. Bulk Mortar and Grout:
   a) Submit certified test reports showing that the cementitious components of the mix comply with the specified requirements.
   b) Submit certified test report showing that the grout complies with the specified requirements.

1.04 QUALITY ASSURANCE

A. Field Sample (Panels for Texture and Color Approvals Only): In an area on the site where approved by the Project Manager, provide sample masonry panels.
1. Make each sample panel approximately 4’-0" high and 4’-0" long.
2. Provide one sample panel for each combination of face brick, concrete unit masonry, bond pattern, mortar color, and joint type used in the Work.
3. Revise as necessary to secure approval from Owner and Project Manager.
4. Completely demolish and remove from the job site upon completion and acceptance of the work.

B. Pre-Installation Meetings: Not less than one week prior to commencing all masonry related items a preinstallation conference shall be held at the site. Attendance is mandatory for all trades affected by this section. The general contractor shall be responsible for coordinating this conference with all affected trades (including but not limited to job site superintendent, masonry contractor, masonry foreman, waterproofing and flashing contractor, concrete block insulator and Project Manager. The Project Manager shall conduct the business of this meeting. All masonry work that takes place prior to this conference will be marked as rejected and will be removed, no exceptions.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver grout and mortar mix to site in sealed bags. Identify each bag with material name and type.

B. Acceptance at Site:
1. Deliver materials in manufacturer’s unopened containers, fully identified with name, brand, type and grade.
2. Materials with missing illegible identification shall be rejected.

C. Storage and Protection:
1. All masonry products stored on-site shall be properly covered from the weather to prevent deterioration and moisture penetration. Broken or damaged masonry products shall be rejected. Do no double-stack pallets.
2. Grout and mortar mix shall be sealed and stored off the ground to prevent contact with the soil.

1.06 PROJECT CONDITIONS

A. Project Environmental Requirements:
1. Comply with requirements of referenced standards and recommendations of material manufacturers for environmental conditions before, during and after installation.
2. Do not begin installation until building is completely enclosed and HVAC system is operating and maintaining temperature and humidity conditions consistent with "after occupancy" conditions for a minimum of two weeks.
3. Maintain continuous and uniform building temperatures of not less than 50° F during installation nor more than 100° F.
4. Ventilate spaces receiving tile in accordance with material manufacturers' instructions.
5. Maintain illumination as required for proper installation of material.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with requirements indicated herein, provide products of one of the listed manufacturers.

B. Bulk Mortar and Grout: Quikrete Companies; One Securities Centre, 3490 Piedmont Road, Atlanta, GA; 404.634.9100, www.quikrete.com.

C. Horizontal Reinforcement: Hohmann & Barnard, Inc., 30 Rasons Court, Hauppauge, NY, 631.234.0600, h-b.com.

D. Weep Hole Vents: Hohman and Bernard.

2.02 MORTAR

A. Mix Applications:
1. Above grade installations: Use Type N.

B. Type N Mortar: Mix to the Property Specifications of ASTM C 270.
1. Compressive Strength: 750 psi, minimum, at 28 days for laboratory mixed mortar with a flow of 110 plus/minus five percent (5%).
2. Water Retention: Seventy-five percent (75%), minimum.
3. Air Content: Fourteen percent (14%) maximum, except when structural reinforcement is incorporated into mortar, not more than twelve percent (12%) unless bond strength test data is submitted to justify higher air content.
4. Aggregate Ratio: No less than 2.25 and no more than 3.5 times the sum of the separate volumes of cementitious materials.

C. Masonry Mortar Mix: Factory blended hydraulic cement/lime/sand mix proportioned to produce masonry mortar complying with the property Specification in ASTM C 270 for the specified type of masonry mortar.
1. Portland Cement or Blended Cement: ASTM C 150 Types I, IA, II, IIA, III or IIIA.
2. Portland Cement or Blended Cement: ASTM C 595 Types IS, IS-A, IP, IP-A, I(PM), I(PM)-A, I(SM), or I(SM)-A.

3. Portland Cement or Blended Cement: ASTM C 1157 Types GU, HE, MS, HS, MH or LH.
4. Lime: Hydrated lime, ASTM C 207, Type S.
5. Sand: Mason's sand, ASTM C 144.
6. No admixtures are allowed.

D. Accessory Materials:
1. Water: Clean and free from deleterious acids, alkalis and organic matter.
2. Pigment: Match existing.

E. Job Site Mixed Mortar:
1. Provide job site mixed mortar under alternate bid.
2. Mortar Material
a) Pre-mixed bags of Portland cement and hydrated lime, or prior approved equal.
(1) AHI Supply, Inc., Friendswood, TX, 800.873.5794.
(2) Substitutions: Under provisions of Section 01 33 00 – Submittals and Substitutions.
3. Mortar Mixture:
a) No admixtures are allowed.
b) Measure the ingredients accurately using one cubic foot batching boxes (not shovels).
c) Mix three fourths of the required water, half of the sand, and all of the cement and lime for not less than one or more than two minutes. Add the remainder of sand and water and mix for not longer than three minutes. Use a mechanical batch mixer.
d) Re-temper stiffened mortar by adding water as frequently as needed to restore required consistency. Do not use mortar beyond one and one-half (1-1/2) hours after mixing.

2.03 METAL CONNECTORS AND REINFORCEMENT

A. Bars: Comply with ASTM A 615, Grade 60, unless otherwise shown on the Drawings, using deformed bars for Number 3 or larger.

B. Horizontal Reinforcement: Reinforced hot-dipped galvanized wall reinforcing in conformance with ASTM A951, for high tensile steel. Side and transverse rods 9-gauge, side rods deformed to develop minimum surface bond of 527 psi when cast in ASTM Class A mortar cubes.
1. Triangular Masonry Ties: #363-BT Anchor x 3/16" diameter wire hot-dipped galvanized ties with #360 hot-dipped galvanized channel for weld-on ties. Size as required.
2. Veneer Anchors: #X-SEAL (3") with Vee Wall Tie at 1'-4" on center each way.

2.04 WEEP HOLE VENTS

A. Size one-half inch by two and one-half inches high (1/2" x 2-1/2") by three and one-half inches (3-1/2") wide.
B. Description: Honey comb type. Color to match mortar as selected by Project Manager.

2.05 COMPONENTS

A. Bond Break Material: Provided one (1) layer of 6 mil polyethylene equal to "Visqueen Vapour Barrier" as a bond breaker between all clay masonry and CMU in the same wythe. Rake joint back three-eighths inch (3/8") and provide continuous sealant at joint.

2.06 MIXING

A. Grout:
   1. Mixing Procedure: Add factory pre-blended dry materials to water in mortar mixer and mix for at least five minutes.
   2. Retempering: Do not retemper grout; discard grout that cannot be easily pumped or poured.
   3. Cold Weather: Follow National Concrete Masonry Association recommendations for cold weather construction.

B. Mortar:
   1. Mixing Procedure: Add factory pre-blended dry materials to water in mortar mixer and mix for at least three to five minutes.
   2. Retempering: Use mortar within two hours of initial mixing. Retemper mortar that has stiffened because of evaporation of water from mortar by adding water and blending as frequently as needed to restore required consistency.
   3. Cold Weather: Follow National Concrete Masonry Association recommendations for cold weather construction.

C. Completely empty the drum before placing materials for the succeeding batch.

2.07 SOURCE QUALITY CONTROL

A. Tests/Inspections: Perform testing as requested by Project Manager and according to ASTM standards.

PART 3 - EXECUTION

3.01 EXAMINATION

A. General:
   1. Contractor shall note that the dimensions shown on the floor plans and plan details are nominal masonry dimensions. The contractor is responsible for coordinating the masonry layout to provide three-eighth inch (3/8") joints. If conflict occurs, contractor shall contact Project Manager prior to installing masonry.

B. Site Verification of Conditions:
   1. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
   2. Verify that wall ties and reinforcement are properly located.
   3. Verify that flashings are properly located and intact.

C. Temperature and Humidity:
1. During cold weather construction do not lay masonry units unless the temperature is 40° F and rising.
2. During hot weather construction (ambient air temperature exceeds 100° F or 90° F with wind velocity greater than 8 mph) do not spread mortar beds more than four feet (4') ahead of masonry and set brick masonry within one minute of spreading mortar. Fog spray cure twice daily at four hour intervals for three days during hot weather.
3. Protect masonry construction from direct exposure to wind and sun when erected in ambient air temperature of greater than 99° F in the shade, with relative humidity less than fifty percent (50%).
4. During hot weather protect brick masonry units from sun until units are ready to be placed in the wall.

3.02 PREPARATION

A. Surface Preparation (Collection System and Weeps):
1. Clean flashing and weep holes so they are free of mortar droppings and debris immediately prior to installing collection system or weep.
2. Remove projecting mortar and other protrusions from substrate.
3. Remove mortar and debris from cavity spaces, wall ties and reinforcing.

3.03 INSTALLATION

A. Mortar and Grout:
1. Head Joints: Regardless of thickness, completely fill with mortar or grout. Do not slush full.
2. Except at the finishing course, stop grout approximately one inch (1") below the top of the last course.
3. At the finishing course, bring the last grout pour flush with the top of the brick.
4. Whenever possible, grout from the inside face of the masonry.
5. Take extreme care to prevent grout or mortar staining the face of masonry to be left exposed or unpainted.
6. Protect sills, ledges, offsets, door jams, corners and similar points from damage and from collecting mortar or grout.
7. Immediately remove mortar and grout from areas where they are not scheduled to be placed.
8. All mortar shall be hard and durable after curing. Scratchable mortar is not acceptable.
9. Perform grouting in strict accordance with the provisions of the Building Code.
10. Solidly fill vertical cells containing reinforcement.
11. Consolidate grout at time of pour by puddling with a mechanical vibrator, filing all cells of the masonry, and then reconsolidating later by puddling before the plasticity is lost.

B. Metal Connectors and Reinforcement:
1. Underlay Insulation Masonry Tie Installation
a) Bracket legs shall firmly engage steel stud flange. Place bracket over a steel stud framing member and impale into insulation. Secure bracket to steel stud in accordance with manufacturer's instructions.
b) Insert tie into slotted portion of masonry tie bracket. Adjust vertically to fit masonry coursing.

2. Do not use reinforcement having any of the following defects
   a) Bar lengths, depths., or bends exceeding the specified tolerances.
   b) Bends or kinks not indicated on the Drawings or required for the Work.
   c) Bars with cross-section reduced due to excessive rust or other causes.

C. Weep Hole Vent Installation: Place weep vents in head joints at exterior wythe of the cavity wall located immediately above all flashings, ledges, heads or lintels, sills, and low roof to high wall conditions, spaced twenty-four inches (24") on center for clay masonry units and thirty-two inches (32") on center for concrete masonry units, unless otherwise shown. Install with notched side down. Leave the side of the masonry units clear from mortar (unbuttered) forming the vent space. Slid the vent material into joint once the two masonry units are in place. Install the weep vents as the wall is being erected so joints do not become filled with mortar or debris. Install a minimum of two weeps above each exterior door/window.

D. Site Tolerances:
1. Maximum deviation from plumb or level: ±1/4" in 10'-0", ±1/2" in 20'-0".
2. Deviation from vertical alignment of centerline of nearest corresponding head joints in other than stacked bond: ±1/4".
3. Maximum deviation from specified mortar joint thickness: ±1/8".
4. Maximum deviation from the specified cross sectional dimension of walls: ±1/4".
5. If the construction tolerance is incompatible with size variation in the masonry units, notify the Project Manager prior to masonry construction.

E. Interface with Other Work:
1. Through-Wall Flashings: Provide through-wall flashings as specified in Section 04 05 23 of these Specifications.
2. Sheet Metal and Miscellaneous Accessories: Provide sheet metal flashings and trim as specified in related Sheet Metal Sections of these Specifications.

3.04 FIELD QUALITY CONTROL

A. Site Tests, Inspections to be performed daily.

3.05 CLEANING

A. Thoroughly clean all masonry surfaces to be left exposed in the finish work. Remove all traces of mortar, grout and foreign matter. Provide pointing and cleaning to match existing.

3.06 PROTECTION

A. The masonry walls shall be covered at the end of each work day and when work is not in progress. The walls shall be covered with heavy plastic sheeting or water repellant tarps and shall extend a minimum of two fee (2'-0") down each side of the wall and be securely held in place.

B. Protect work so that it will be without any evidence of damage or use at time of acceptance.

END OF SECTION 04 05 00

SECTION 04 05 23
THROUGH-WALL AND VERTICAL WALL FLASHING SYSTEM

PART 1 - GENERAL

1.01 GENERAL

A. Contractor shall review American Concrete Institute 530.1 mandatory specification checklist for additional requirements necessary for specific project.

B. Flashing system shall be provided and installed by a qualified waterproofing contractor.

C. Contractor shall provide a photo manifest of through-wall installation, including all starts, stops, and transitions in plane.

D. It is the intent of this specification that the new work will provide a watertight facility (restricted to the location where work is to be performed). The attached specifications describe the minimum acceptable standards of construction and finish.

E. Contractor shall water test all through-wall flashings once veneer is twelve inches (12”) above installed flashing. Coordinate test with Architect and Consultant.

F. Manufacturer of cloak flashing shall have a representative inspect the installed work a minimum of two times per week. The representative shall not be the installer. Provide field report to Owner after each visit.

G. All vertical flashing to be installed full height of the vertical surface.

1.02 QUALITY ASSURANCE

A. At a scheduled pre-construction meeting with all trades, contractor shall review flashing for the project and how the flashing shall be sequenced with the following: below grade waterproofing, air and vapor system, window installation, sealant installation, relief angles and roofing.

1.03 SUBMITTALS

A. Shop Drawings: Contractor shall provide from the manufacturer a review of the flashing design for the project and location of preformed shapes on reduced floor plan.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer’s original, unopened containers and rolls with all labels intact and legible including labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions. Materials damaged in shipping or storage shall not be used.

B. Manufacturer's packaging and/or roll plastic is not acceptable for exterior storage. Tarpaulin with grommets shall be minimum acceptable for exterior coverings. All materials stored as above shall be a minimum of four inches (4") off the substrate, and the tarpaulin tied off with rope.

C. Deliver materials in sufficient quantity to allow continuity of work.

D. Handle and store material in such a manner as to avoid damage.

E. Protect materials against damage by construction traffic.

F. Storage: All materials should be stored under cover to avoid site damage. During cool weather construction, store materials inside at 50º F or higher.

G. The proper storage of materials is the sole responsibility of the contractor and damaged materials shall be discarded, removed from the project site, and replaced prior to application.

1.05 SITE CONDITIONS

A. Job Condition Requirements: Coordinate the work of the contractor with the work to be performed by the Owner's personnel, to ensure proper sequencing of the entire work. The contractor shall follow local, state, and federal regulations, safety standards, and codes. When a conflict exists, use the stricter document.

B. Protection of Work and Property:
   1. Work: The contractor shall maintain adequate protection of all his work from damage and shall protect the Owner's and adjacent property from injury or loss arising from this contract. He shall provide and maintain at all times any OSHA required danger signs, guards, and/or obstructions necessary to protect the public and his workmen from any dangers inherent with or created by the work in progress. All federal, state, and city rules and requirements pertaining to safety and all EPA standards, OSHA standards, NESHAP regulations shall be fulfilled by the contractor as part of his proposal.
   2. Property: Protect existing planting and landscaping as necessary or required to provide and maintain clearance and access to the work of this contract. Examples of two categories or degrees of protection are generally as follows: a) removal, protection, preservation, or replacement and replanting of plant materials; b) protection of plant materials in place, and replacement of any damage resulting from the contractor's operations.

C. Damage to Work of Others: The contractor shall repair, refinish, and make good any damage to the building or landscaping resulting from any of his operation. This shall include, but is not limited to, any damage to plaster, tile work, wall covering, paint, ceilings, floors, or any other finished work. Damage done to the building, equipment, or grounds shall be repaired at the successful contractor's expense holding the Owner harmless from any other claims for property damage and/or personal injury.

D. Measurements: It will be the contractor's responsibility to obtain and/or verify any necessary dimensions by visiting the job site, and the contractor shall be responsible for the correctness of same. Any drawings supplied are for reference only.

E. Cleaning and Disposal of Materials:
1. Contractor shall keep the job clean and free from all loose materials and foreign matter. Contractor shall take necessary precautions to keep outside walls clean.
2. All waste materials, rubbish, etc., shall be removed from the Owner's premises as accumulated. Rubbish shall be carefully handled to reduce the spread of dust. At completion, all work areas shall be left clean and all contractor's equipment and materials removed from the site.
3. Debris shall be deposited at an approved disposal site.

1.06 WARRANTY

A. Flashing Manufacturer: Project shall be installed in such a manner that the flashing material manufacturer will furnish a written ten (10) year materials warranty from the date of substantial completion of the completed project.

PART 2 – PRODUCTS

2.01 BUILT-IN FLASHING MEMBRANE (ELVALOY® SHEET)

A. The built-in flashing membrane shall be 40 mil flexible sheet material, consisting of a blend of elastomeric and thermal plastic polymers, incorporating DuPont™ Elvaloy®. The membrane shall be reinforced with synthetic fibers, calendered into sheet form, rolled and cut to width.

B. Cloaks shall be pre-formed, three dimensional flexible units used for detail corners, level changes, stop ends, and special applications.

Physical Properties		
Elongation	175%	ASTM D412
Tensile Strength	650 psi	ASTM D412
Tear Strength	280 psi	ASTM D624
Low Temperature Flexibility	-25º F Pass	ASTM D146
Water Absorption	Less than 0.1%	ASTM D471

C. Cloak color shall be as selected by Architect and/or shall match mortar color. Reference manufacturer's list of colors for selection.

2.02 RELATED MATERIALS FOR BUILT-IN FLASHING MEMBRANE

A. Flashing Membrane Adhesive: Flashing adhesive exceeds the requirements of TTS00230C Type II, Class B, ASTM C 92094. The product shall be terra cotta (dull red) in color.

Physical Properties		
Hardness Shore A	24 ± 3	ASTM C 661
Shear Strength	75 psi	ASTM D 1002
Tack Free Time	25 minutes	ASTM C 679
Slump (sag)	Zero slump	ASTM C 697
Shrinkage	No measurable shrinkage after 14 days	
Low Temperature Flexibility	-20° F pass 1/4 inch mandrel	
Service Temperature	-40° F to 200° F continuous service	
Shelf Life	One year	

2.03 SURFACE-ADHERED WITH DRIP FLASHING MEMBRANE (ELVALOY® SHEET)

A. Surface-adhered with drip membrane shall be a composite 40 mil membrane consisting of 25 mils of elastomeric/thermal plastic membrane incorporating DuPont™ Elvaloy® and 15 mils of SBS asphaltic adhesive. The membrane shall be reinforced with synthetic fibers, calendered into sheet form, rolled and cut to standard widths.

B. Standard Sheet Dimensions:

Thickness	40 mil
Roll length	75 ft
Roll widths	12, 18, 24, 36 in

C. Cloaks shall be pre-formed, three dimensional flexible units used for detail corners, level changes, stop ends, and special applications.

Physical Properties		
Elongation	225%	ASTM D412
Tensile Strength	875 psi	ASTM D412
Tear Strength	270 psi	ASTM D624
Low Temperature Flexibility	-25º F Pass	ASTM D146
Water Absorption	Less than 0.1%	ASTM D471

2.04 RELATED MATERIALS FOR SURFACE ADHERED FLASHING MEMBRANE

A. Asphalt Primer: Shall be a two-sided, self-adhering tape used to seal the top of cloaks against the back-up wythe. Adhesive may be used as an alternative.

B. Substrate Primer:

Physical Properties		
Solids by Weight	68%	
Viscosity	758 cps	
Weight per Gallon	9.3 lbs.	
Elongation	>656% no Breakage, Exceeded Travel of Instron	ASTM D 2370
Tensile Strength	85.1 psi	ASTM D 2370
pH	10	
Hardness Shore A	59	
Peel Strength	Aluminum No Fail at 4.60 pli	
	Concrete No Fail at 3.86 pli	

C. Mastic: Shall be used at all laps and joints, and top terminations.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine conditions for compliance with requirements for installation tolerances and other specific conditions.

3.02 GENERAL

A. Laying Masonry Walls: Use an inverted lintel CMU or fully grouted hollow CMU as a base for flashing at sills, floor joints, and other similar conditions.

B. Preparation: All sharp protrusions and mortar droppings must be removed from the substrate, and the surface must be clean and dry.

C. Where brick work occurs above the roof elevation, provide solid protection of the existing roof system until work is complete.

D. Flashing shall be fully supported when crossing the cavity except at sill and coping locations.

E. Flashing shall be fully adhered around all wall penetrations prior to veneer installation.

3.03 INSTALLATION OF THROUGH-WALL FLASHING IN EXISTING WALLS

A. To install continuous flashing in existing walls, remove alternate sections of masonry in two to five feet (2-5') lengths. The flashing shall be installed in these sections and the masonry replaced. Alternately temporary braces may be installed as longer sections of brickwork are removed. The flashing shall then be installed in these sections. The lengths of flashing shall be lapped a minimum of six inches (6") with an end dam at each joint, and be completely sealed to function properly. The opening shall then be filled as described in Brick Replacement. The replaced masonry shall be properly cured (five to seven days) before the intermediate masonry sections or supports are removed.

3.04 BRICK REMOVAL

A. At locations indicated, remove bricks that are damaged, spalled, or deteriorated. Carefully demolish or remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.
   1. When removing single bricks, remove material from center of brick and work toward outside edges.

B. Support and protect remaining masonry that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

C. Notify Structural Engineer and/or Project Manager of unforeseen detrimental conditions including voids, cracks, bulges, and loose masonry units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.

D. Remove in an undamaged condition as many whole bricks as possible.
   1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
   2. Store brick for reuse, as indicated.
   3. Deliver cleaned brick not required for reuse to Owner's Agent, unless otherwise directed.

E. Clean bricks surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.

3.05 INSTALLATION OF BUILT-IN FLASHING MEMBRANE

A. Flashing membrane and cloaks shall be installed in a bed of fresh mortar and should extend through the outer wythe a minimum of one-fourth inch (1/4") and left exposed. Flashing membrane is UV resistant.

B. Weep holes shall be provided immediately above all flashing at 24-inch centers. A minimum of two weeps shall be installed above any wall opening.

C. All joints in the flashing membrane shall be lapped a minimum of four inches (4") using flashing membrane adhesive.

D. Flashing membrane shall be installed six inches (6") above finished grade level.

E. Cloaks and end dams shall be installed at all window and door heads and sills.

F. Vertical flashing at wall openings shall extend into the wall opening four inches (4"). The door/window frame shall be installed with the flashing extending onto the back of the frame.

G. Cleaning: Flashing membrane shall not be damaged by cavity cleaning after installation. Precautions to be taken during subsequent work are:
   1. Use of cavity battens to prevent mortar droppings;
   2. Removal of droppings before they harden;
   3. Never use implements such as steel rods for cleaning the cavity; and
   4. Inspection of cavity flashing for damage as the work proceeds.

3.06 INSTALLATION OF SURFACE-ADHERED FLASHING WITH DRIP MEMBRANE

A. Priming: All flashing substrates shall be primed. Flashing primer shall be applied with a brush, roller or sprayed. Coverage is approximately 400 square feet per U.S. gallon (3.78L). Drying time may vary depending on temperature, humidity, and air movement; drying time should be approximately 45 minutes.

B. Flashing System Installation: Starting at a corner, mount cloak to substrate flashing adhesive. Cut surface adhered membrane into workable sections (8'-10'). Remove the release sheet and adhere the membrane to the inner leaf of construction lapping the membrane onto the cloak four inches (4"). Use firm hand pressure and a steel roller to totally adhere membrane in place. Extend membrane completely through the outer leaf and leave it exposed one-fourth inch (1/4") minimum. The surface-adhered membrane is UV resistant. Apply a bead of flashing mastic to all top termination edges.

C. Termination Bar: The surface-adhered membrane shall be installed using a termination bar for additional attachment to the inner leaf (optional).

D. Weep holes shall be provided immediately above all flashing at 24-inch centers. A minimum of two baffle weeps shall be installed above any wall opening.

E. Flashing membrane shall be installed six inches (6") above finished grade level.

F. Stop end cloaks shall be installed at all windows, door heads, sills, and through-wall starts, stops, steps, etc.

G. Enveloped vertical flashing at wall openings shall extend onto the window unit one inch (1"). The door/window frame shall be installed with the flashing extending onto the back of the frame.

H. Enveloped vertical flashing shall be installed at all abutments of dissimilar exterior wall treatments: inside and outside nineties (90°), etc.

I. Cleaning: Flashing membrane shall not be damaged by cavity cleaning after installation. Precautions to be taken during subsequent work are:
   1. Use of cavity battens to prevent mortar droppings;
   2. Removal of droppings before they harden;
   3. Never use implements such as steel rods for cleaning the cavity; and
   4. Inspection of cavity flashing for damage as the work proceeds.

3.07 BRICK REPLACEMENT

A. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

B. Lay replacement brick with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C 67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. Use wetting methods that ensure that units are nearly saturated but surface is dry when laid. Maintain joint width for replacement units to match existing joints.
   1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.

3.08 FLASHING MEMBRANE ADHESIVE

A. Application:
   1. Flashing adhesive shall be applied to clean, dry and relatively smooth surfaces.
   2. When joint two (2) pieces of flashing membrane, or joining flashing membrane to Cloaks:
      a) Apply two (2) one-fourth inch (1/4") beads of adhesive approximately one-half inch (1/2") and one and one-half inch (1-1/2"), respectively, from the edge of the bottom membrane along the entire width of the bottom membrane. Overlap the top membrane over the bottom membrane two inches (2") and roll lap with steel hand roller, causing excess to extrude the entire length of the overlap.
   3. Do not remove excess adhesive.

B. Safety, Storage and Handling: Keep container tightly closed when not in use. Store at room temperature. Clean up tools and hands with waterless hand cleaner.

3.09 SUBSTRATE PRIMER

A. Surface Preparation: Areas to be primed should be dry.

B. Application: Substrate primer may be applied using a soft roller or brush. It can be removed from masonry with soapy water while wet and a solvent-based cleaner if dry (mineral spirits or citrus cleaner).

C. Coverage: Depending on the condition of the surface, coverage may vary from as little as 150 square feet to 200 square feet per gallon.

D. Caution:
   1. Substrate primer should not be applied when temperatures are below 40° F or when rain is imminent.
   2. Keep substrate primer from freezing.
   3. During hot weather, the product should be stored in a cool shaded area.
   4. Do not thin this product.
   5. Curing rates will vary depending on the ambient temperature relative humidity, wind speed, sky condition and the proper rate of application. Generally speaking, Substrate primer will dry within 15 to 30 minutes when applied at 70° F or above. At 50° F, on a cloudy day, cure time may be extended to as much as one hour.
   6. Check several places on primed area for dryness prior to proceeding with the flashing application.

END OF SECTION 04 05 23

SECTION 04 21 00
CLAY MASONRY UNITS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes, but is not limited to:
1. Clay Masonry Units – Face Brick
2. Clay Masonry Units –Structural Glazed Clay Facing Tile

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. C126-99 – Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick and Solid Masonry Units
2. C216-03a – Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)

B. Industry Association Standards:
1. Brick Industry Association (BIA)

1.03 SUBMITTALS

A. Shop drawings, product data and samples under provisions of Section 01 33 00.

B. Product Data:
1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications and other data needed to verify compliance with the specified materials.

1.04 QUALITY ASSURANCE

A. Reference Section 04 05 00 – Basic Masonry Materials and Methods for Requirements.

B. Installer Qualifications: Specializing in masonry work having a minimum of five (5) continuous years successful documented experience with work comparable to that required for this Project.

C. Preinstallation Meetings: Reference Section 04 05 00 – Basic Masonry Materials and Methods for Requirements.

1.05 DELIVERY, STORAGE AND HANDLING

A. Reference Section 04 05 00 – Basic Masonry Materials and Methods for Requirements.

B. Acceptance at Site: Brick with cracked or chipped faces will be rejected if non-compliant with the limits noted in ASTM C 216.

PART 2 - PRODUCTS

2.01 FACE BRICK

A. General – Comply with ASTM C 216 latest revisions.

B. Acceptable Manufacturers: Subject to compliance with requirements herein, provide products from one of the following manufacturers:
1. Acme Brick Company, 2821 W. 7th Street, Fort Worth, TX, 800.792.1234, www.brick.com.
2. Boral Bricks, 600 Northridge Road, Suite 300, Atlanta, GA, 800.526.7255, www.boralbricks.com.
3. Endicott Clay Products Company, 57120 707th Road, Fairbury, NE, 402.729.3315, www.endicott.com
4. Summit Brick & Tile, Erie Street, Pueblo, CO, 719.542.8278, www.summitbrick.com.
5. Substitutions: Under provisions of Section 01330 – Submittals and Substitutions.

C. Field Brick – Exterior:
1. Type: FBS, or match existing
2. Grade: SW, or match existing
3. Size: Closure (nominal 4" x 4" x 8"), or match existing
4. Finish: Match existing

PART 3 - EXECUTION

3.01 EXAMINATION

A. Site Verification of Conditions: Examine the area and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Temperature and Humidity:
1. Reference Section 04 05 00 – Basic Masonry Materials and Methods for Requirements.
2. During hot weather protect brick masonry units from sun until units are ready to be placed in the wall.

3.02 PREPARATION

A. Surface Preparation:
1. Do not commence installation until surfaces are clean, rough, and level.
2. Remove all laitance and foreign material from top of ledge.
3. Verify that the elevation is such that the bed joint thickness will be between three-eighths inch (3/8") and one-half inch (1/2"), and that the edge is true to line.
4. Clean surface free from loose scale, dirt, concrete and other material that will inhibit bond.

3.03 INSTALLATION

A. Reference Section 04 05 00 – Basic Masonry Materials and Methods for Requirements.

B. Wetting of Bricks: Provide brick with IRA less than 25 g/min/30 inch squared so that mortar will remain plastic enough to permit the brick to be leveled and plumbed immediately after being laid without destroying the bond. Brick may not be wetted immediately before it is laid. Wet brick thoroughly three to twenty-four hours prior to use.

C. Laying:
1. Brick and CMU wythes shall be laid in a true and straight alignment.
2. Unless otherwise indicated on the drawings, make the brickwork plumb, level and true to line, with square angles and corners.
3. Use the blocks whenever possible. When it is absolutely necessary to use a line pin, fill the hole immediately after the pin is withdrawn.
4. Use only bricks that are clean and free from dust and other foreign matter.
5. Lay in running bond unless otherwise shown on the Drawings.
6. Brick with cracks and/or chipped faces will be rejected if non-compliant with the limits noted in ATM C 216. If such units are discovered in the finished wall, the Contractor shall remove the units and replace with new units at no cost to the Owner.
7. Do not use bonding headers on grouted masonry unless specifically so directed by the Project Manager.
8. Bed Joints:
   a) Bevel all bed joints, sloping toward the center of the wall in such a manner that the bed joins will be filled when the brick is finally brought to line.
   b) Do not furrow the bed joints.
   c) Avoid fins of bed joints protruding into grout spaces and cavities.
      (1) If they occur, leave in place if not projecting more than the bed joint thickness.
      (2) Cut off and clean out of the grout and cavity spaces.
   d) A complete mortar-to-unit bond is required on all masonry.
9. Head Joints: Regardless of thickness, completely fill with mortar or grout. Do not slush full.
10. Lay both wythes of the wall to a line.
11. Where bricks are moved or shifted, remove and lay again in fresh mortar.
12. Immediately remove mortar and grout from areas where they are not scheduled to be placed.
13. Keep cavity between brick and CMU clean at all times.
14. Do not lay face brick overhand.
15. Bed joints in brick masonry shall course out with bed joints in adjacent masonry wythes at vertical intervals of one foot, four inches (1’-4").

D. Joinery:
1. General:
   a) Cut out and repoint defective joints.
   b) On all joints exposed to the weather, tool and make smooth, solid and watertight.
   c) All joints shall be thumbprint hard prior to tooling.
   d) Use one foot, six inch (1’-6") sled on bed joints, brush wall and retool joints.

2. Joint Pattern:
   a) Joints not exposed to the weather, and joints to be covered with a succeeding layer of plaster or similar material, unless otherwise directed, provide "struck" joints.
   b) Provide "concave tooled" joints at all exposed joints or match existing.

E. Masonry Expansion Joints - Brick:
1. Locate three-eighths (3/8") wide expansion joints as indicated on the drawings. However in no case shall they exceed twenty feet, zero inches (20'-0") in distance for exterior walls and twenty-five feet, zero inches (25'-0") in distance for interior walls. Contractor shall ensure that expansion joints occur at intervals no more than as noted above and notify the Project Manager for coordination of placement if additional joints are required. Joint shall be completely clean from construction debris and mortar. Keep vertical joints straight, true and continuous from top to bottom of masonry. Detail joint as shown on the drawings.
2. Expansion joints shall be free of mortar and the joint reinforcement shall not continue across the expansion joint. Keep vertical joints straight, true and continuous from top to bottom of masonry.

F. Site Tolerances: Reference Section 04 05 00 – Basic Masonry Materials and Methods for Requirements.

G. Interface with Other Work:
1. Reference Section 04 05 00 – Basic Masonry Materials and Methods for Requirements.
2. Through-Wall Flashings: Provide through-wall flashings as specified in Section 04 05 23 of these Specifications.
3. Sheet Metal and Miscellaneous Accessories: Provide sheet metal flashings and trim as specified in Section 07 62 00 of these Specifications.
4. Expansion Joints: Provide compressible joint filler, sealant and backer rod.

3.04 CLEANING

A. Cleaning: Thoroughly clean all masonry surfaces to be left exposed in the finish work. Remove all traces of mortar, grout and foreign matter. Provide pointing and cleaning as specified.

3.05 PROTECTION

A. The masonry walls shall be covered at the end of each workday and when work is not in progress. The walls shall be covered with heavy plastic sheeting or water repellant tarps and shall extend a minimum of two feet, zero inches (2'-0") down each side of the wall and be securely held in place.

END OF SECTION 04 21 00

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. This Section includes the following:
1. Rooftop equipment bases and support curbs, as required.
2. Wood furring, grounds, nailers, and blocking, as required.
3. Removal and replacement of damaged, deteriorated or non-compliant five-eighths inch (5/8") fire rated plywood sheathing for roof substrate, as required.

1.02 DEFINITIONS

A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise specified.

B. Exposed Framing: Dimension lumber not concealed by other construction and indicated to receive a stained or natural finish.

1.03 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for the following products:
1. Metal framing anchors.
2. Construction adhesives.

C. Material certificates for dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee's (ALSC) Board of Review.

D. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:
1. For each type of preservative-treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
2. For waterborne-treated products, include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site.

E. Warranty of chemical treatment manufacturer for each type of treatment.

F. Research or evaluation reports of the model code organization acceptable to authorities having jurisdiction that evidence the following products' compliance with building code in effect for Project.
1. Metal framing anchors.
2. Power-driven fasteners.

1.04 QUALITY ASSURANCE

A. Testing Agency Qualifications: To qualify for approval, an independent testing agency must demonstrate to Structural Engineer's and/or Project Manager's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.

B. Single-Source Responsibility for Engineered Wood Products: Obtain each type of engineered wood product from one source and by a single manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.
   1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers (For Wood Sources Outside the Scope Requirements for Fire-Treated Plywood): Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Wood-Preservative-Treated Materials:
      a) Baxter: J. H. Baxter Co.
      b) Chemical Specialties, Inc.
      c) Continental Wood Preservers, Inc.
      d) Hickson Corp.
      e) Hoover Treated Wood Products, Inc.
      f) Osmose Wood Preserving, Inc.
   2. Metal Framing Anchors:
      a) Cleveland Steel Specialty Co.
      b) Harlen Metal Products, Inc.
      c) Silver Metal Products, Inc.
      d) Simpson Strong-Tie Company, Inc.
      e) Southeastern Metals Manufacturing Co., Inc.

2.02 LUMBER, GENERAL

A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.

B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:
   1. NELMA - Northeastern Lumber Manufacturers Association.
   2. RIS - Redwood Inspection Service.
   3. SPIB - Southern Pine Inspection Bureau.

4. WCLIB - West Coast Lumber Inspection Bureau.
5. WWPA - Western Wood Products Association.

C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
1. For exposed lumber, furnish pieces with grade stamps applied to ends or back of each piece, or omit grade stamps and provide grade-compliance certificates issued by inspection agency.

D. 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.
1. Provide dressed lumber, S4S, unless otherwise indicated.
2. Provide dry lumber with nineteen percent (19%) maximum moisture content at time of dressing for two inch (2") nominal thickness or less, unless otherwise indicated.

2.03 WOOD-PRESERVATIVE-TREATED MATERIALS

A. General: Where lumber or plywood is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.
1. Do not use chemicals containing chromium or arsenic.
2. For exposed items indicated to receive stained finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.

B. Pressure treat aboveground items with waterborne preservatives to a minimum retention of 0.25 lb/cu. ft. After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 percent, respectively. Treat indicated items and the following:
1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

C. Complete fabrication of treated items before treatment, where possible. If cut after treatment, apply field treatment complying with AWPA M4 to cut surfaces. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

2.04 DIMENSION LUMBER

A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.

B. Framing Other than Non-Load-Bearing Partitions: Provide framing of the following grade and species:
1. Grade: No. 2.
2. Species: Southern pine; SPIB.

C. Other Framing Not Listed Above: Provide the following grades and species:
1. Grade: No. 2.

2. Species: Southern pine; SPIB.

2.05 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.

B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.

C. Moisture Content: Nineteen percent (19%) maximum for lumber items not specified to receive wood preservative treatment.

D. Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No. 3 Common grade per NELMA, NLGA, or WWPA; No. 2 grade per SPIB; or Standard grade per NLGA, WCLIB or WWPA of any species.

2.06 WOOD-BASED STRUCTURAL-USE PANELS, GENERAL

A. Structural-Use Panel Standard: Provide plywood panels complying with DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood."

B. Trademark: Factory mark structural-use panels with APA trademark evidencing compliance with grade requirements.

2.07 CONCEALED, PERFORMANCE-RATED STRUCTURAL-USE PANELS

A. General: Where structural-use panels are indicated for the following concealed types of applications, provide APA-performance-rated panels complying with requirements designated under each application for grade, span rating, exposure durability classification, and edge detail (where applicable).
1. Thickness: Provide panels meeting requirements specified but not less than thickness indicated.
2. Span Ratings: Provide panels with span ratings required to meet "Code Plus" provisions of APA Form No. E30, "APA Design/Construction Guide: Residential & Commercial."

B. Roof Sheathing: APA-rated sheathing, minimum five-eighths inch (5/8").

C. Roof Sheathing: APA-rated Structural I sheathing.
1. Exposure Durability Classification: Exterior.
2. Span Rating: 40/20 or Roof - 40.

2.08 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.

B. Nails, Wire, Brads, and Staples: FS FF-N-105.

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

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1.

F. Bolts: Steel bolts complying with ASTM A 325, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

G. Fastener for Wood Deck: Shall be a #14 fastener, fluorocarbon coated, with CR-10 coating. A minimum .200 diameter shank and .250 diameter thread. To be used with round pressure plates or bar, and having a fluorocarbon CR-10 coating, when subjected to thirty (30) Kesternich cycles (DIN 50018) shows less than 10% red rust which surpasses FM Global Approval Standard 4470, or approved equal. Fasteners, plates, and/or bars shall be listed in the FM Global Approval Guide.

2.09 METAL FRAMING ANCHORS

A. General: Provide galvanized steel framing anchors of structural capacity, type, and size indicated and as follows:
1. Research or Evaluation Reports: Provide products for which model code research or evaluation reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with building code in effect for Project.
2. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.

B. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 coating designation; structural, commercial, or lock-forming quality, as standard with manufacturer for type of anchor indicated.

C. Joist Hangers: U-shaped joist hangers with two inch (2") long seat and one and one-fourth inch (1-1/4") wide nailing flanges at least 85 percent of joist depth.
1. Thickness: 0.052 inch.
2. Thickness: 0.064 inch.

D. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.
1. Strap Width: 1-1/2 inches.
2. Strap Width: 2 inches.
3. Thickness: 0.052 inch.
4. Thickness: 0.064 inch.

E. Bridging: Rigid, V-section, nail-less type, 0.064 inch thick, length to suit joist size and spacing.

2.10 VERTICAL WALL SHIMMING MATERIAL

A. Shall be one of the following unless otherwise accepted by Owner's representative: OSB, exterior grade plywood, gypsum core board or concrete core board. Proper selection of material is required to achieve FM Global and UL guidelines.

PART 3 – EXECUTION

3.01 INSTALLATION, GENERAL

A. Discard units of material with defects that impair quality of rough carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.

C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.

D. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.

E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
   1. CABO NER-272 for power-driven staples, P-nails, and allied fasteners.
   2. Published requirements of metal framing anchor manufacturer.
   3. "Recommended Nailing Schedule" of referenced framing standard and with AFPA's "National Design Specifications for Wood Construction."
   4. "Table 2304.9.1-Fastening Schedule" of the 2012 International Building Code.

F. Use common wire nails, unless otherwise indicated. Use finishing nails for finish work. 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; predrill as required.

G. Use stainless-steel nails where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity.

H. Countersink nail heads on exposed carpentry work and fill holes with wood filler.

3.02 NAILERS

A. Wooden nailers shall be installed at gravel stops, drip edges, and expansion joints on outside perimeter of building according to NRCA, Underwriters Laboratory and IBC guidelines.

B. All Construction: Gravel stop and drip edge nailers shall be the same height as the new insulation being installed where required. Nailers shall be raised if necessary by anchoring an additional nailer of appropriate height to the existing nailer if the existing nailer is not to be replaced. Nailers shall be anchored to resist a pull-out force of one hundred seventy-five pounds (175#) per foot. Fasteners shall be no less than two (2) per nailer, and be spaced at three feet (3') on center maximum. Expansion joint nailers shall extend upward a minimum of eight inches (8") above finish roof height.

C. Where parapet wall exists, fire treated plywood lumber must be installed a minimum of twelve inches (12") above finished roof surface to provide substrate for horizontal termination of roof to wall flashing system.

3.03 WOOD CANTS

A. Toe of structural cant shall be level with the surface to receive new roof membrane and in all cases anchored according to NRCA, Underwriters Laboratory and IBC guidelines.

3.04 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

A. Install wood grounds, nailers, blocking, and sleepers where required for screeding or attaching other work. Form to shapes shown and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

C. Install permanent grounds of dressed, preservative-treated, key-beveled lumber not less than one and one-half inches (1-1/2") wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.05 WOOD FRAMING, GENERAL

A. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.

B. Install framing members of size and at spacing indicated.

C. Do not splice structural members between supports.

D. Firestop concealed spaces of wood-framed walls and partitions at each floor level and at ceiling line of top story. Where firestopping is not inherent in framing system used, provide closely fitted wood blocks of two inch (2") nominal thickness lumber of same width as framing members.

3.06 INSTALLATION OF STRUCTURAL-USE PANELS

A. General: Comply with applicable recommendations contained in APA Form No. E30, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.
   1. Comply with "Code Plus" provisions of above-referenced guide.

B. Fastening Methods: Fasten panels as indicated below:
   1. Sheathing: Mechanically attach to steel framing.
      a) Space panels 1/8 inch at edges and ends.

C. Roof Deck: Shall consist of five-eighths inch (5/8") thick fire rated plywood, conforming to APA psi rated sheathing 42/20, exterior. Face grain of plywood shall be perpendicular to supports with a staggered lay-up. Plywood shall span over at least two supports. Plywood shall be attached to supports with self-drilling screws at twelve inches (12") on center maximum at intermediate supports and at six inches (6") on center maximum at panel edges in the field of the roof, and at six inches (6") on center along the panel perimeter, and six inches (6") on center through the field of the panel along the building perimeter. All attachment shall be in strict accordance with provisions of ASCE 7-05. Minimum modulus of elasticity shall be 180,000 psi.

END OF SECTION 06 10 00

SECTION 06 10 53
MISCELLANEOUS CARPENTRY

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:
1. Framing with dimension lumber.
2. Rooftop equipment bases and support curbs.
3. Wood blocking, cants, and nailers.
4. Wood furring.
5. Sheathing.
6. Subflooring and underlayment.
7. Interior wood trim.
8. Shelving and clothes rods.
9. Plywood backing panels.

1.02 DEFINITIONS

A. Lumber grading agencies, and the abbreviations used to reference them, include the following:
1. NELMA - Northeastern Lumber Manufacturers Association.
2. NLGA - National Lumber Grades Authority.
3. SPIB - Southern Pine Inspection Bureau.
4. WCLIB - West Coast Lumber Inspection Bureau.
5. WWPA - Western Wood Products Association.

1.03 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials, both before and after exposure to elevated temperatures when tested according to ASTM D 5516 and ASTM D 5664.
3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
4. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
   1. Preservative-treated wood.
   2. Fire-retardant-treated wood.
   3. Power-driven fasteners.
   4. Powder-actuated fasteners.
   5. Expansion anchors.
   6. Metal framing anchors.

1.04 QUALITY ASSURANCE

A. Forest Certification: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria":
   1. Dimension lumber.
   2. Miscellaneous lumber.
   3. Plywood.
   4. Hardboard underlayment.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels; place spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.01 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
   1. Factory mark each piece of lumber with grade stamp of grading agency.
   2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
   3. 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.
   4. Provide dressed lumber, S4S, unless otherwise indicated.
   5. Provide dry lumber with nineteen percent (19%) maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.
   6. Provide dry lumber with fifteen percent (15%) maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

B. Wood Structural Panels:
   1. Plywood
   2. Oriented Strand Board
   3. Thickness: As needed to comply with requirements specified but not less than thickness indicated.

4. Comply with "Code Plus" provisions in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial."
5. Factory mark panels according to indicated standard.

2.02 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA C2 (lumber) / AWPA C9 (plywood), 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 the following:
      a) Ammoniacal copper zinc arsenate (ACZA).
   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 material after treatment to a maximum moisture content of nineteen percent (19%) for lumber or fifteen percent (15%) for plywood. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
   1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

D. Application: Treat items indicated on Drawings, and the following:
   1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
   2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
   3. Wood framing members less than eighteen inches (18") above grade.
   4. Wood floor plates that are installed over concrete slabs directly in contact with earth.

2.03 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, provide materials that comply with performance requirements in AWPA C20 (lumber) or AWPA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.
   1. Use treatment for which chemical manufacturer publishes physical properties of treated wood after exposure to elevated temperatures, when tested by a qualified independent testing agency according to ASTM D 5664 for lumber or ASTM D 5516 for plywood.
   2. Use treatment that does not promote corrosion of metal fasteners.
   3. Use Exterior type for exterior locations and where indicated.
   4. Use Interior Type A High Temperature (HT), unless otherwise indicated.

B. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.

2.04 DIMENSION LUMBER

A. General: Provide dimension lumber of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.

B. Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 2 grade and any of the following species:
1. Mixed southern pine; SPIB.
2. Hem-fir or Hem-fir (north); NLGA, WCLIB, or WWPA.
3. Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.
4. Eastern softwoods; NELMA.
5. Northern species; NLGA.
6. Western woods; WCLIB or WWPA.

C. Other Framing: Construction, Stud, or No. 2 grade and any of the following species:
1. Douglas fir-larch; WCLIB or WWPA.
2. Douglas fir-south; WWPA.
3. Douglas fir-larch (north); NLGA.
4. Hem-fir; WCLIB or WWPA.
5. Hem-fir (north); NLGA.
6. Southern pine; SPIB.
7. Mixed southern pine; SPIB.
8. Spruce-pine-fir (south); NELMA, WCLIB, or WWPA.
9. Spruce-pine-fir; NLGA.

2.05 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction, including the following:
1. Rooftop equipment bases and support curbs.
2. Blocking.
3. Cants.
4. Nailers.
5. Furring.
6. Grounds.

B. For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with fifteen percent (15%) maximum moisture content and any of the following species:
1. Mixed southern pine; SPIB.
2. Hem-fir or Hem-fir (north); NLGA, WCLIB, or WWPA.
3. Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.
4. Eastern softwoods; NELMA.
5. Northern species; NLGA.
6. Western woods; WCLIB or WWPA.

C. For exposed boards, provide lumber with fifteen percent (15%) maximum moisture content and any of the following species and grades:
1. Eastern white pine, Idaho white, lodgepole, ponderosa, or sugar pine Premium or 2 Common (Sterling) grade; NELMA, NLGA, WCLIB, or WWPA.
2. Mixed southern pine, B & B Finish No. 1 grade; SPIB.
3. Hem-fir or Hem-fir (north), Superior or C & Btr Finish grade; NLGA, WCLIB, or WWPA.

4. Spruce-pine-fir (south) or Spruce-pine-fir, grade; NELMA, NLGA, WCLIB, or WWPA.
5. Western red cedar, A grade; NLGA or WWPA.

D. For concealed boards, provide lumber with fifteen percent (15%) maximum moisture content and any of the following species and grades:
1. Mixed southern pine, No. 2 grade; SPIB.
2. Hem-fir or Hem-fir (north), Construction or 2 Common grade; NLGA, WCLIB, or WWPA.
3. Spruce-pine-fir (south) or Spruce-pine-fir, Construction or 2 Common grade; NELMA, NLGA, WCLIB, or WWPA.
4. Eastern softwoods, No. 2 Common grade; NELMA.
5. Northern species, No. 2 Common grade; NLGA.
6. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA.

2.06 PANEL PRODUCTS

A. Miscellaneous Concealed Plywood: Exterior sheathing, span rating to suit framing in each location, and thickness as indicated but not less than three-fourths inch (3/4").

B. Plywood Underlayment: DOC PS 1, Exterior A-C with fully sanded face, thickness as indicated but not less than three-fourths inch (3/4").

C. Hardboard Underlayment: AHA A135.4, Class 4 (Service), Surface S1S; with back side sanded.

D. Miscellaneous Exposed Plywood: DOC PS 1, A-D Interior, thickness as indicated but not less than three-fourths inch (3/4").

2.07 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, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Wire, Brads, and Staples: FS FF-N-105.

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

D. Wood Screws: ASME B18.6.1.

E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

F. Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M).

G. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

H. 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: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

2.08 METAL FRAMING ANCHORS

A. General: Provide galvanized steel framing anchors of structural capacity, type, and size indicated and acceptable to authorities having jurisdiction.

B. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

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

C. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.

D. Securely attach carpentry work as indicated and according to applicable codes and recognized standards.

E. Countersink fastener heads on exposed carpentry work and fill holes with wood filler.

F. Use fasteners of appropriate type and length. Predrill members when necessary to avoid splitting wood.

3.02 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.

3.03 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
   1. Fire block furred spaces of walls, at each floor level and at ceiling, with wood blocking or noncombustible materials accurately fitted to close furred spaces.

B. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal furring vertically at sixteen inches (16") o.c.

3.04 PANEL PRODUCT INSTALLATION

A. Wood Structural Panels: Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.
Comply with "Code Plus" provisions in above-referenced guide.

B. Particleboard Underlayment: Comply with the National Particleboard Association's recommendations for type of subfloor indicated. Fill and sand gouges, gaps, and chipped edges. Sand uneven joints flush.

C. Hardboard Underlayment: Comply with AHA's "Application Instructions for Basic Hardboard Products" and hardboard manufacturer's written instructions for preparing and applying hardboard underlayment.

END OF SECTION 06 10 53

SECTION 07 22 16
ROOF BOARD INSULATION

PART 1 – GENERAL

1.01 REFERENCES

A. American Society of Testing Materials (ASTM)
1. C 177-85 Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
2. C 209-84 Methods of Testing Insulating Board (Cellulosic Fiber), Structural and Decorative.
3. C 728-89a Perlite Thermal Insulation Board
4. D 41-85 Asphalt Primer Used in Roofing and Waterproofing.
5. D 312-89 Asphalt Used in Roofing.
6. D 1621-73 (1979) Test Method for Compressive Properties of Rigid Cellular Plastics.
7. D 4601-86 Asphalt Coated Glass Fiber Base Sheet Used in Roofing.

B. National Roofing Contractors Association (NRCA)

C. (ANSI/SPRI)

D. ASCE 7 wind uplift criteria

1.02 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Classified by Underwriter's Laboratories (UL) as Class A roof covering.
2. Follow local, state, and federal regulations, safety standards, and codes.

B. Installation:
1. Installation shall be in accordance with manufacturer's current published application procedures, NRCA general recommendations, and ASCE 7 wind uplift criteria.
2. Roof system manufacturer's technical specifications shall be considered part of this specification and shall be used as reference for specific application procedures.

1.03 SUBMITTALS

A. Product Data: Submit Manufacturer's product data sheets for each product.

B. Shop Drawings: Layout of roof plan showing tapered design, tapered insulation pattern, direction of slope, amount of slope, spot elevations indicating thicknesses at high and low points.

C. Certification: Submit roof manufacturer's certification in writing that insulation is acceptable as substrate for application of specified roof system.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store materials in accordance with manufacturer's recommendations.

B. When stored outdoors:
   1. Tarp and shield insulation from moisture and ultraviolet rays.
   2. Elevate insulation above substrate four inches minimum.
   3. Secure insulation to resist high winds.
   4. Distribute insulation stored on roof deck to prevent concentrated loads that would impose excessive stress or stain on deck or structural members. Verify that structure can accommodate additional loading.
   5. Wet insulation, or insulation that has been wet but which has dried, may not be used and shall be removed completely and immediately from the job site.
   6. Do not double stack bundles of insulation on the rooftop.

1.05 SEQUENCING AND SCHEDULING

A. Substrate Acceptance: Roof system manufacturer's representative shall inspect roof deck and associated substrates and provide written acceptance of conditions.

B. Manufacturer's approved roofing contractor shall inspect and approve deck and substrates.

C. Plan roof layout with respect to roof deck slope to prevent rainwater drainage into completed roofing.

D. Do not install more insulation than can be covered with complete roof system in same day.

1.06 PRODUCT CONDITIONS

A. Environmental Requirements:
   1. Apply roofing and insulation in dry weather.
   2. Do not proceed with roof construction during inclement weather or when precipitation is predicted 40% or more possibility.
   3. Do not apply insulation over wet or moist deck or in foggy conditions.
   4. Days with wind speeds of 30 mph or greater shall be considered "Bad Weather" days.

B. Emergency Equipment: Maintain on-site equipment and material necessary to apply emergency temporary seals I the event of sudden storms or inclement weather.

C. Costs for emergency roofing shall be borne by Contractor.

PART 2 – PRODUCTS

2.01 INSULATION

A. All insulation shall be approved in writing by the membrane manufacturer as to thickness, type, and manufacturer. All insulation must be approved for the specific application, Underwriters Laboratory approved, and be listed in the FM Global Approval Guide. All roof areas are to maintain a total R value of R25 in all reroof locations.

B. Polyisocyanurate Roof Insulation: Insulation shall be rigid polyisocyanurate foam board; thickness and LTTR-value shall be a minimum of R25; meeting Federal Specification No. HH-I-1972/1 or 2 with 20 psi minimum compressive strength and 2.0 pcf minimum density. Board shall be surfaced on two (2) sides with non-asphaltic facer material with one and one-half inch (1.5") minimum starting edge thickness.

C. Tapered Polyisocyanurate Roof Insulation: Shall be tapered polyisocyanurate board per Federal Specification No. HH-I-1972/1 or 2, with a 20 psi minimum compressive strength and 2.0 pcf density minimum. Insulation shall be of thickness required for one-eighth inch (1/8") slope per foot to roof drains as shown on drawings. Insulation shall be surfaced on two (2) sides with a non-asphaltic facer material. Provide minimum R-value of R-25.

D. Factory Tapered Polyisocyanurate Crickets: Factory cut twenty-four inch by forty-eight inch (24" x 48") polyisocyanurate board cut to one-half inch (1/2") per foot slope used in conjunction with standard thickness of polyisocyanurate board to provide positive slope to drains. To be used where field of roof slope is 1/4” per foot with a minimum R-value of R-25.

E. Factory Tapered Polyisocyanurate Crickets: Factory cut twenty-four inch by forty-eight inch (24" x 48") polyisocyanurate board cut to one-quarter inch (1/4") per foot slope used in conjunction with standard thickness of polyisocyanurate board to provide positive slope to drains. To be used where field of roof slope is 1/8” per foot with a minimum R-value of R-25.

F. Coverboard: Shall be thickness of 1/2", R of 1.75, wood fiber board size four feet by eight feet (4’ x 8’), impregnated six (6) sides with asphalt, Underwriters Laboratory approved and listed in the FM Global Approval Guide.

2.02 BITUMEN

A. Shall be ASTM D 312 Type IV extra steep asphalt.

Slope	Interply	Top Pour	Backnail	Strap
0 - ½" per 12"	Type IV	Type IV	No	No
½" - 2" per 12"	Type IV	Type IV	Yes	Strap if possible
2" - 3" per 12"	Type IV	Type IV	Yes	Yes

2.03 ASPHALT ROOF PRIMER

A. Quick-dry asphalt-based primer for priming of asphalt roof surfaces, or approved equal.

Applicable Federal Specification	SS-A-701B
ASTM	D 41
Flash Point	105° F
Viscosity at 80° F (ASTM D 217)	50-60 K.U.
Weight per gallon	7.4 pounds
Drying time (to touch)	Min. 4 hours

2.04 ROOFING INSULATION ADHESIVE

A. Shall be a dual component, reaction cure polyurethane adhesive, meeting the following physical properties, or approved equal.

Density	ASTM D-1622	Free Rise 3.2 lb/cf
Compressive Strength	ASTM D-1621	Parallel 38 psi @ 6% deflection
Tensile Strength	ASTM D 1623	35 psi
Water Absorption	ASTM D 2843	5.1%
Closed Cell Content	ASTM D 2856	90% min.; R-value= 3.8 new
Weight/Gallon (Liquid Components)		"Part 1" Component = 10.32 lbs.
	"Part 2" Component = 8.54 lbs.	
	"Part 1" Component = 225 cps	
	"Part 2" Component = 275 cps	

2.05 FASTENERS

A. Fasteners and fastening plates or bars shall be as recommended by the fastener manufacturer for the specific application.

B. Fastener for Brick: Shall be one-fourth inch by two inches (1/4" x 2"), zinc with plated steel or stainless steel nail, one piece unit, flat head, as manufactured by Rawl Zamac Nailin, or approved equal.

C. Fastener for Steel Decks: Shall be a #14 fastener, fluorocarbon coated, with CR-10 coating. A minimum .200 diameter shank and .250 diameter thread. To be used with round pressure plates or bar, and having a fluorocarbon CR-10 coating, when subjected to thirty (30) Kesternich cycles (DIN 50018) shows less than 10% red rust which surpasses FM Global Approval Standard 4470, as manufactured by Olympic Manufacturing Group, Inc., or approved equal. Fasteners, plates, and/or bars shall be listed in the FM Global Approval Guide.

PART 3 – EXECUTION

3.01 PROTECTION

A. Provide special protection from traffic on yet to be removed roofing.

B. Provide special protection from traffic on completed work.

3.02 EXAMINATION AND PREPARATION

A. Do not install until defects are corrected and deck substrate meets roof system manufacturer's requirements.

B. Do not apply insulation unless asphalt application temperature, EVT of approximately 375° F to 425° F, can be maintained or when water or moisture is present on substrate. Do not heat asphalt above flashing point, or 525° F.

C. Examine substrate and related surfaces, and verify that there are no conditions such as inadequate anchorage, foreign materials, moisture, ridges, depressions, or other conditions which would prevent satisfactory installation of roof system.

D. Start of work constitutes acceptance of deck substrate and site conditions.

E. Sweep deck substrate clean of dust and debris immediately prior to installation of tapered insulation.

3.03 INSULATION INSTALLATION

A. Manufacturer's Instructions: In regard to attachment, the manufacturer's instructions or specifications shall determine the suitability for an application. Installation must meet ASCE 7 criteria and meet local governing building codes.

B. Precautions: The surface of the insulation must not be ruptured due to overdriving of fasteners.

C. Thermal insulation boards shall be laid on the substrate in parallel rows with end joints staggered and butted as close as possible. All joints shall be tight and at the roof perimeter and roof penetrations, insulation shall be cut neatly and fitted to reduce openings to a minimum. All openings one-fourth inch (1/4") or larger shall be filled with insulation.

D. Insulation shall be tapered or feathered at drains and scuppers to provide proper drainage (if applicable).

E. No more insulation shall be installed than can be covered by the completed roof system by the end of the day or the onset of inclement weather.

F. Tapered insulation and crickets shall be placed in accordance with the drawings and/or as required to minimum of NRCA standards.

3.04 ADHERED INSULATION

A. After proper priming of the deck as required, specified insulation shall be bonded to the deck with a solid mopping of steep asphalt Type IV, as required by slope (NRCA), at the minimum rate of thirty pounds (30#) ± 20% per one hundred (100) square feet and immediately walked in place.

B. Specified insulation shall be bonded to the specified base sheet with a solid mopping of steep asphalt Type IV, as required by slope (NRCA), at the minimum rate of thirty pounds (30#) ± 20% per one hundred (100) square feet and immediately walked in place.

C. The top surface of installed insulation shall be coated with hot asphalt using thirty pounds (30#) per one hundred (100) square feet of surface, and specified layer of tapered insulation shall be applied using offset joints, so that each layer breaks joints to a minimum of six inches (6") both ways with the preceding layer, and immediately walked in place.

D. The top surface of installed insulation shall be coated with hot asphalt using thirty pounds (30#) per one hundred (100) square feet of surface, and an additional layer of specified insulation shall be applied using offset joints, so that each layer breaks joints to a minimum of six inches (6") both ways with the preceding layer, and immediately walked in place.

E. The new layer of insulation shall be applied over the existing insulation using offset joints, so that each layer breaks joints to a minimum of six inches (6") both ways with the preceding layer.

3.05 MECHANICALLY FASTENED INSULATION

A. Specified insulation shall be mechanically fastened to conform to the ASCE 7 criteria for wind uplift as dictated by wind zone applicable to location of project. Fasteners and fastening patterns shall be determined by building height, location and geographical area of the United States. It is the contractor’s responsibility to consult current publications, literature, and bulletins of IBC and the manufacturer that are in effect at the time of this project. Boards shall be staggered and butted as close as possible with voids over one-fourth inch (1/4") to be filled.

B. Insulation shall be installed to conform to the ASCE 7 criteria, and shall be laid with edges parallel to flutes and bearing on deck surface/flats. The long dimension of base insulation layer must be fully supported by the top flange of the metal deck. The edges of insulation boards must not cantilever over the flutes of the metal deck.

C. The top surface of insulation shall be coated with hot asphalt using thirty pounds (30#) per one hundred (100) square feet of surface, and an additional layer of specified insulation shall be applied using offset joints, so that each layer breaks joints to a minimum of six inches (6") both ways with the preceding layer, and immediately walked in place.

D. The top surface of insulation shall be coated with hot asphalt using thirty pounds (30#) per one hundred (100) square feet of surface, and specified layer of tapered insulation shall be applied using offset joints, so that each layer breaks joints to a minimum of six inches (6") both ways with the preceding layer, and immediately walked in place.

3.06 ADJUSTING

A. Remove insulation which has been damaged (broken, cracked, punctured, wet, etc.) and install acceptable new units before installation of roof system.

3.07 CLEANING

A. Remove debris and material wrappers from jobsite. Leave insulation clean and dry, ready to receive roofing membrane.

3.08 PROTECTION

A. Provide special protection from traffic on completed work.

END OF SECTION 07 22 16

SECTION 07 42 00
PRE-FORMED METAL WALL PANELS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: Galvanized metal wall panel, parapet wall cladding system with related flashing, counterflashing closures and trim.

1.02 SYSTEM DESCRIPTION

A. Flush panel profiled metal wall panel, secured to steel 'hat-channel' furring members applied over waterproof membrane sheathing on existing wall surfaces.

B. Performance Requirements: Wall panel system shall prevent water from entering the building through the system.

1.03 REFERENCES

A. American Society for Testing and Materials:
1. ASTM A 153 Zinc Coating (Hot Dip) or Iron and Steel Hardware
2. ASTM A 446 Steel Sheet, Zinc Coated (Galvanized) by the Hot Dip Process, Structural (Physical) Quality
3. ASTM E 84 Surface Burning Characteristics of Building Materials
4. ASTM E 1592 Structural Performance of Sheet Metal Roofing and Siding

B. American Institute of Steel Construction
1. Code of Standards

1.04 SUBMITTALS

A. Submit in accordance with the provisions of Division 1.

B. Product Data: Provide data describing physical and performance characteristics and limitations including span tables, component profiles, fastening methods, joint detailing and accessories, standard sizes and surface characteristics.

C. Shop Drawings: Provide complete system drawings, including fully dimensioned panel layout, construction details, means of anchorage, method and sequence of installation, locations and size of shop cut openings, and type of closures, trim and fittings.

D. Samples:
1. Color chart of all prefinished and/or galvalume metal to be used.
2. Twelve inch by twelve inch (12" x 12") sized sample illustrating selected profile, surface texture and color.

E. Installer's Certificate: Certifying that products and systems have been installed according to manufacturer's instructions and applicable codes and ordinances.

F. Manufacturer's Installation Instructions: Include installation sequence, special instructions and Material Safety Data Sheets.

G. Manufacturer's Certificate: Certificate stating products meet or exceed all specified requirements and that systems have been designed according to applicable codes and ordinances.

H. Maintenance Data: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and schedule for recommended cleaning and maintenance.

I. Contract Closeout Submittals:
   1. Project Record Documents
   2. Contractor's Five Year Labor and Material Warranty
   3. Manufacturer's Maintenance Data

1.05 QUALITY CONTROL

A. Work of this section shall conform to NRCA Roofing and Waterproofing Manual and Manufacturer's Instructions.

B. Qualifications for Work of this Section:
   1. Manufacturer specializing in the manufacturer of products in this section with a minimum five (5) years documented experience of those products being used.
   2. Applicator specializing in applying the work and products of this section with a minimum of three (3) years documented experience, and approved by the Manufacturer to install the approved roof system.

C. Regulatory Requirements:
   1. Conform to all applicable local codes for roof assembly fire hazard and wind resistance.
   2. If inspection is required by the authority having jurisdiction, provide certification of inspection confirming approval of design and installation by that authority.

D. Preinstallation Conference:
   1. Convene a preinstallation conference prior to commencing the work of this section, under provisions of applicable section.
   2. Require attendance of parties directly affecting work of this section.
   3. Review conditions of demolition, if applicable, installation, installation procedures and coordination with related work.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver products to the site and store/protect under the provisions of these specifications.

B. Deliver products in manufacturer's original containers, dry, undamaged, with seal and labels in tact. Include test report data.

C. Store products in weather protected environment, on pallets of blocking so as to be clear of ground moisture.

D. Cut plastic wrapping materials to encourage ventilation.

E. Do not store more materials on the roof than can be installed within two days.

1.07 PROJECT CONDITIONS

A. Do not apply metal wall panels during inclement weather.

B. Do not apply metal wall panels to deformed or misaligned structural frame, deck or substrate.

1.08 SEQUENCING AND SCHEDULING

A. Coordinate work under provisions of Division 1.

B. Coordinate work with other trades and work to ensure sufficient materials and manpower are available to completely install and make watertight all wall panels on a daily basis.

C. Coordinate installation of associated metal flashing and related items as work of this section proceeds.

1.09 WARRANTY

A. Provide five (5) year warranty from installer, covering damage to building resulting from failure to resist penetration of water. Warranty shall cover costs for material and labor to replace defective work.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Metal Wall Panels: Flush panel profile wall panels having a nominal twelve inch by one inch (12" x 1") depth with interlocking panel side joints resulting in a concealed fastener system.
   1. Petersen Aluminum Corp.
   2. McElroy Metals
   3. Berridge
   4. Prior approved alternate

2.02 MATERIALS

A. Flush Panel Metal Wall Panels: Minimum 24-gauge core metal, G-90 galvanized steel, metal wall panel having twelve inch (12") nominal width, by one inch (1") in depth: Flush panels with Kynar finish. Color to be selected from Manufacturers full range of colors including metallic and premium colors.

B. Accessories:
   1. Mechanical Fasteners: Self-drilling, self-tapping screws with rubber washer and compression flange, pre-painted to match wall panel, as supplied by the panel system manufacturer and approved for use with the selected wall panel.
   2. Steel Hat Channels: Minimum 18-gauge, cold-rolled, galvanized steel hat section furring strip.

3. Sheathing Membrane: 40 mil high temperature self-adhering (250° F. minimum) waterproofing membrane.
4. Metal Furring Anchors: Tap-con screws, as manufactured by Rawl.
5. Sealants: Manufacturer's standard type suitable for use with installation of metal system; non-staining, skinning, non-shrinking, non-sagging, ultraviolet resistant for exterior applications, color as selected. Sonneborn NP1
6. Internal and External Corners: Having same core metal and finish as wall panel.
7. Touch-up Paint: As supplied by the approved panel manufacturer to match finished panel color.
8. Provide seven-eighths inch (7/8") hat channels at sixteen inches (16") on center vertical, continuous horizontal over waterproofing membrane.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify that surfaces to receive metal panels are properly aligned, free of depressions, waves or abrupt projections.

C. Verify that surfaces are dry.

D. Verify that pipes, sleeves, ducts and vents through walls are fixed in place.

3.02 FABRICATION

A. Wall Panels: Fabricate panels from approved manufacturer, in required lengths to eliminate transverse panel joints to the greatest extent possible.

B. Internal and External Corners: Shall be fabricated from matching sheet materials, thickness and finish to match roof panel; profile to suit system and seams as encountered; brake formed, shop cut and factory mitered.

C. Trim, Closure Pieces, Caps and Fascias: Same material, thickness and finish as sheet and panel stock; brake formed to required profiles as indicated on details.

D. Anchorage and Support Members: Spacing of furring channels shall be as recommended by approved panel manufacturer. In no case shall vertical spacing exceed thirty inches (30").

E. On-site fabrication of component profiles, trim or closures is prohibited.

3.03 EXECUTION

A. Install sheathing membrane vertically to wall surface with two inch (2") side laps. Secure with sufficient fasteners to hold into place until furring can be secured.

B. Install furring sections horizontally. Provide for anchorage within four inches (4") of the top of the panel and within four inches (4") of the bottom of the panel. Provide intermediate furring as required to limit furring spacing to thirty inches (30"). Secure to wall with approved fasteners at sixteen inches (16") on center staggered, alternating from top to bottom flange.

C. Install flashing receiver and sill trim prior to wall panel installation.

D. Install wall panels plumb and true within one-eighth inch (1/8") vertical tolerance from top to bottom of panel. Secure with stainless pan-head screws at each furring channel.

E. Install trim pieces in accordance with detail drawings. Where no detail is provided, follow manufacturer's instructions. Secure trim metal at twelve inches (12") on center staggered.

3.04 FIELD QUALITY CONTROL

A. Inspection and testing will be performed under the applicable provisions of Division 1.

B. Correct identified defects or irregularities. Repair defects in the roofing system before the end of each day, or as otherwise dictated by Owner's Representative.

3.05 CLEANING

A. Remove visible markings from finished areas and surfaces, leaving all exposed surfaces smooth and free of imperfections.

B. Where finished surfaces may be soiled by work of this section, consult manufacturer of surfaces which have been soiled for cleaning advice and conform to their documented instructions.

C. Repair or replace defaced or disfigured finishes caused by work of this section.

END OF SECTION 07 42 00

SECTION 07 53 00
COAL-TAR ELASTOMERIC ROOFING SYSTEM

PART 1 – GENERAL

1.01 DEFINITIONS

ACM	Asbestos Containing Materials
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
CTEM	Coal-Tar Elastomeric Membrane
EIP	Ethylene Interpolymer
EPA	Environmental Protection Agency
EPDM	Ethylene Propylene Diene Monomer
EPS	Expanded Polystyrene
EVT	Equiviscous Temperatures
FM	Factory Mutual
IBC	International Building Code
KEE	Ketone Ethylene Ester
NDL	No Dollar Limit
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NRCA	National Roofing Contractors Association
OSHA	Occupational Safety & Health Administration
SBS	Styrene-Butadiene-Styrene
SDI	Steel Deck Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPRI	Single Ply Roofing Industry
UL	Underwriters Laboratories, Inc.

1.02 REFERENCES (INCLUDING LATEST REVISIONS)

A. Comply with governing local, state, and federal regulations, safety standards, and codes.

B. Testing Laboratory Services: Test results shall meet or exceed established standards.

C. Underwriters Laboratories, Inc. (Roofing Covering): Class A fire hazard classification.

D. American Society for Testing and Materials (ASTM)

E. The National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual

F. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) - Architectural Sheet Metal Manual

G. American Society of Civil Engineers – ASCE 7

1.03 INSTALLER QUALIFICATIONS

A. Roofing installer must be:
1. Currently prequalified with the Owner in accordance with Owner's prequalification requirements.
2. Currently in good standing with the manufacturer.
3. Installer must be an experienced single firm specializing in the type of roofing repair and/or removal and replacement work required, employing only experienced workers for the class of work in which they are employed, having at least five (5) years successful experience on projects similar in size and scope and acceptable as applicators by the Architect.
4. Contractor must have successfully completed previous projects warranted by the manufacturer.

B. It shall remain each Bidder's responsibility to determine his current status with the manufacturer's certification plan.

1.04 MANUFACTURER QUALIFICATIONS

A. A qualified manufacturer is one that is UL listed and has FM approvals for a membrane roofing system similar to that used for this project for a minimum of fifteen (15) years.

1.05 CONTRACT DOCUMENT QUALITY ASSURANCE

A. In the case of an inconsistency between the drawings and specifications or within either document not clarified by addendum, the better quality or greater quantity of work shall be provided in accordance with the Architect's interpretation.

1.06 SUBMITTALS

A. Samples and Manufacturer's Submittals: Submit prior to delivery or installation.
1. Samples of all roofing system components including all specified accessories.
2. Samples of all materials used on the project, which are not supplied by the membrane manufacturer, shall be submitted to the membrane manufacturer for written approval prior to work starting.
3. Submit samples of proposed warranty complete with any addenda necessary to meet the warranty requirements as specified.
4. Submit latest edition of manufacturer's specifications and installation procedures. Submit only those items applicable to this project.
5. A written statement from the roofing materials manufacturer approving the installer, specifications and drawings as described and/or shown for this project and stating the intent to guarantee the completed project.
6. Manufacturer's Equiviscous Temperatures (EVT) for the specified bitumens.

B. Shop Drawings: Provide details of all perimeter conditions, projection conditions, and any additional special job condition details other than indicated in the drawings.

C. Maintenance Procedures: Within ten days of the date of Substantial Completion of the project, deliver to the Owner two copies of the manufacturer's printed instructions regarding care and maintenance of the roof.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened containers and rolls with all labels intact and legible including labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions. Materials damaged in shipping or storage shall not be used.

B. Manufacturer's packaging and/or roll plastic is not acceptable for exterior storage. Tarpaulin with grommets shall be minimum acceptable for exterior coverings. All materials stored as above shall be a minimum of four inches (4") off the substrate, and the tarpaulin tied off with rope.

C. Deliver materials requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.

D. Deliver materials in sufficient quantity to allow continuity of work.

E. Handle and store material and equipment in such a manner as to avoid damage. Liquid products shall be delivered sealed, in original containers.

F. Handle rolled goods so as to prevent damage to edge or ends.

G. Select and operate material handling equipment so as not to damage existing construction or applied roofing.

H. Moisture-sensitive products shall be maintained in dry storage areas and properly covered. Provide continuous protection of materials against wetting and moisture absorption. Store roofing and flashing materials on clean raised platforms with weather protective covering when stored outdoors.

I. Store rolled goods on end.

J. Protect materials against damage by construction traffic.

K. The proper storage of materials is the sole responsibility of the contractor and any wet or damaged roofing materials shall be discarded, removed from the project site, and replaced prior to application.

L. Comply with fire and safety regulations, especially with materials which are extremely flammable and/or toxic. Use safety precautions indicated on labels.

M. Products liable, such as emulsions, to degrade as a result of being frozen shall be maintained above 40° F in heated storage.

N. No storage of materials shall be permitted on roof areas other than those materials that are to be installed the same day. Any exception must be in written form.

O. The contractor is to erect a temporary chain link fence, minimum six feet (6') in height, around work area stage and kettles. Fence is to be secured on a daily basis.

1.08 SITE CONDITIONS

A. Job Condition Requirements:

1. Coordinate the work of the contractor with the work to be performed by other trades, to ensure proper sequencing of the entire work. The contractor is to schedule his work so that adequate time is allowed for other trades to perform their work.
2. Apply roofing in dry weather.
3. Do not apply roofing when ambient temperature is below 45° F.
4. Proceed with roofing work only when weather conditions are in compliance with manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with specifications.
5. Schedule the work so the building will be left watertight at the end of each day. Do not remove more roofing materials than can be reinstalled in any working day.
6. Load placed on the roof at any point shall not exceed the safe load for which the roof is designed.
7. All surfaces to receive new roofing shall be smooth, dry, and free from dirt, debris, and foreign material before any of this work is installed. Competent operators shall be in attendance at all times equipment is in use. Materials shall be stored neatly in areas designated by the Architect.
8. The contractor is to be aware of the potential for roof leaks on the existing roof as a result of ruptured blisters and/or roof mat damage caused by the vacuum process, foot traffic, or material and equipment storage. The contractor is to take all necessary precautions to prevent damage to the existing roof. All damage to the existing roof that could result in roof leaks is to be repaired on a daily basis by the roofing contractor.
9. The contractor shall follow local, state, and federal regulations, safety standards, and codes for the removal, handling, and disposal of asbestos containing materials, if present. When a conflict exists, follow the stricter document.
10. Due caution should be exercised so as not to alter the structural integrity of the deck. When cutting through any deck, care should be taken so as not to damage the deck or any part of the deck, such as post tension cables, etc.
11. All kettles shall have a fume recovery system, automatic thermostat control, and visible temperature gauge all in working order.
12. The contractor is to verify the location of all interior ducts, electrical lines, piping, conduit, and/or similar obstructions. The contractor is to perform all work in such a manner as to avoid contact with the above mentioned items.
13. Surface and air temperatures should be a minimum 40° F during applications of cleaner and waterproof coating and remain above 40° F for a minimum of four (4) hours following applications. Verify compatibility of cleaner with coatings, paints, primers and joint sealers specified. Advise Architect of any problems in this regard prior to commencing cleaning operations.
14. Temporary Sanitary Facilities: The contractor shall furnish and maintain temporary sanitary facilities for employees' use during this project. These will be removed after the completion of the project. All portable facilities shall comply with local laws, codes, and regulations.

B. Protection of Work and Property:
   1. Work: The contractor shall maintain adequate protection of all his work from damage and shall protect the Owner's and adjacent property from injury or loss arising from this contract. Contractor shall provide and maintain at all times any OSHA required danger signs, guards, and/or obstructions necessary to protect the public and his workmen from any dangers inherent with or created by the work in progress. All federal, state, and city rules and requirements pertaining to safety and all EPA standards, OSHA standards, NESHAP regulations pertaining to asbestos as required shall be fulfilled by the contractor as part of his proposal.
   2. Property: Protect existing planting and landscaping as necessary or required to provide and maintain clearance and access to the work of this contract. Examples of two categories or degrees of protection are generally as follows: a) removal, protection, preservation, or replacement and replanting of plant materials; b) protection of plant materials in place, and replacement of any damage resulting from the contractor's operations.
   3. Finished roof areas shall be protected from damage by the contractor during construction.
   4. Twenty-four Hour Call: The contractor shall have personnel on call 24 hours per day, seven (7) days per week for emergencies during the course of a job. The Architect is to have the 24 hour numbers for the contact. Contractor must be able to respond to any emergency call and have personnel on-site within two (2) hours after contact. Numbers available to the Architect are to be both home and office numbers for:
      a) Job Foreman
      b) Job Superintendent
      c) Owner or Company Officer

C. Damage to Work of Others: The contractor shall repair, refinish, and make good any damage to the building or landscaping resulting from any of his operation. This shall include, but is not limited to, any damage to plaster, tile work, wall covering, paint, ceilings, floors, or any other finished work. Damage done to the building, equipment, or grounds must be repaired at the successful contractor's expense holding the Owner harmless from any other claims for property damage and/or personal injury.

D. Measurements: It will be the contractor's responsibility to obtain and/or verify any necessary dimensions by visiting the job site, and the contractor shall be responsible for the correctness of same. Any drawings supplied are for reference only.

E. Use of Premises:
   1. The contractor is advised that the Owner will occupy the building at all times, and the contractor must provide all safeguards required to protect personnel and to keep noise levels as low as reasonably possible for each operation.
   2. The contractor shall:
      a) Coordinate work in such a manner as to not interfere with the normal operation of the building.

b) Assume full responsibility for protection and safekeeping of products stored on premises.
c) Agree to hold the Owner harmless in any and all liability of every nature and description which may be suffered through bodily injuries, including death of any persons by reason of negligence of the contractor, agents, employees, or subcontractors.

F. Cleaning and Disposal of Materials:
1. Contractor shall keep the job clean and free from all loose materials and foreign matter. Contractor shall take necessary precautions to keep outside walls clean and shall allow no roofing materials to remain on the outside walls.
2. All waste materials, rubbish, etc., shall be removed from the Owner's premises as accumulated. Rubbish shall be carefully handled to reduce the spread of dust. A suitable scrap chute or hoist must be used to lower any debris. At completion, all work areas shall be left broom clean and all contractor's equipment and materials removed from the site.
3. All bituminous or roofing related materials shall be removed from ladders, stairs, railings, and similar parts of the building.
4. Debris shall be deposited at an approved disposal site.

1.09 SEQUENCING AND SCHEDULING

A. Coordinate roofing schedule with work of other trades.

B. Plan lay up of roofing membrane with respect to deck slope. Avoid situations where excessive drainage could pass into completed roofing.

C. Maintain communication with roofing manufacturer's representative to inform of progress and to schedule periodic inspections.

D. All penetrations shall be made in roof prior to beginning with roof installation.

1.10 WARRANTIES

A. Roofing - Manufacturer: Project shall be installed in such a manner that the roofing material manufacturer will furnish a written twenty (20) year NDL type warranty with no exclusion for hail events containing hail stones up to and including four inches (4") from the date of substantial completion of the completed project. Manufacturer issuing warranty shall provide historical data supporting hail resistance.

B. Roofing - Contractor: The contractor, jointly with any subcontractors employed by him, shall guarantee the work required and performed under this contract will be free from defects in workmanship and materials, and that the building will be and remain waterproof for a two (2) year warranty period, after the Owner accepts the work as substantially complete. The warranty shall be in approved notarized written form, to obligate the contractor and his subcontractors, if any, to make good the requirements of the warranty.

C. Warranty repairs shall be performed by a certified installer. The repairs shall be performed in accordance with the manufacturer's written instructions and recommended procedures so as to not void the warranty. Repair of the system, including materials and labor, shall be done at no cost to the Owner.

D. During the proposal period each Bidder shall make arrangements with the material manufacturer to provide the required warranty. Refer to SUBMITTALS Paragraph in this section for requirements concerning submittals of warranty.

PART 2 - PRODUCTS

2.01 GENERAL

A. Compatibility: Provide materials that are recommended by manufacturers to be fully compatible with indicated substrates, or provide separation materials as required to eliminate contact between incompatible materials.

B. All materials shall be furnished, specified, or approved in writing by the manufacturer issuing the warranty.

C. All materials used on the project shall be asbestos free.

D. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.

2.02 FINISH MEMBRANE

A. The coal-tar elastomeric membrane (CTEM) shall be 60 mil overall calendered thickness. The membrane shall be a high-performance elastomeric membrane incorporating a DuPont™ Elvaloy® KEE (ketone ethylene ester), extended with coal-tar pitch and reinforced with polyester fibers.

B. The coal-tar elastomeric membrane (CTEM) shall meet the following physical properties: Elongation 170%, ASTM D 412; Tensile Strength 1500 lbs/in^2, ASTM D 412; Tear Strength 330 ppi, ASTM D 624; Density @ 70° F, 80 lbs/ft^3; Low Temperature Flexibility, Pass, 37-GP-56M; and Water Absorption less than 0.1%, 37-GP-56M.

2.03 BASE FLASHING and VERTICAL WALL MEMBRANE

A. For 4” hail warranty, base flashing membrane shall be fleece-backed material as specified for the installation on the rise walls, parapets, other roof penetrations and curbs, or pre-approved equal.

B. For other warranties, base flashing membrane can be fleeced thermoplastic membrane, or pre-approved equal.

C. Flashing Membrane (Non-fleeced): Flashing membrane shall be utilized for multi-angled intersections, stripping ply, trim strips, and other conditions where molding/forming of the membrane is required.

2.04 BITUMEN

A. Shall be ASTM D 312 Type IV extra steep asphalt.

2.05 UNDERLAYMENT PLIES

A. Shall be Underwriters Laboratory approved.

B. Base Ply at all decks: Tough 85 mil SBS modified asphalt non-woven glass reinforced ply sheet: each roll shall be one and one-half squares of material, approximately 39.4" x 50.3'; meeting ASTM D 6163, Type 1, Grade S, Ruberoid® 20 ply sheet, as manufactured by GAF Corporation, or approved equal."

C. Shall be Type IV fiberglass ply sheet, ASTM D 2178, Type III. Where required by manufacturer.

D. Red Rosin Paper at all perforated/acoustical decks.

2.06 INSULATION

A. All insulation shall be approved in writing by the membrane manufacturer as to thickness, type, and manufacturer. All insulation must be approved for the specific application, Underwriters Laboratory approved.

B. Refer to Roof Board Insulation Specification Section 07 22 16 for further information.

2.07 BONDING ADHESIVE FOR FLASHING

A. Description: Adhesive is a bonding cement of synthetic rubber for fully adhering membranes to various substrates, produced by Ashland Chemical, or approved equal.

Typical Liquid Properties (Room Temperature)	
Color	Amber/Yellow
Base Product	Neoprene
Solids	25%
Specific Gravity	.87
Pounds/Gallon	7.25
Viscosity (CPS)	2500
Solvents	Ketone, Toluene, Aliphatic Hydrocarbon, Zylene
Estimated Coverage	
2 Sided Application	55/70 sq. ft. (2/2.5 mils dry)
DOT Label Required	Flammable Liquid
Code - 584661	

B. Handling: Contains ingredients, which could be harmful if mishandled. Contact with skin and eyes should be avoided and necessary protective equipment and clothing should be worn.

2.08 SUBSTRATE BOARDS

A. Refer to Roof Board Insulation Specification Section 07 22 16 for further information.

2.09 CANT STRIP

A. Structural: Shall be wood where used for structural purposes meeting NRCA, FM Global and Underwriters Laboratory guidelines.

B. Non-structural: Shall be wood fiber where used for non-structural purposes, conforming to ASTM C208 and C209.

2.10 ROUGH LUMBER

A. All wood nailers, structural cants, curbs, and other miscellaneous rough carpentry, shall be lumber as recommended by NRCA, and Underwriters Laboratory guidelines.

B. Vertical Wall Shimming Material: Shall be exterior grade plywood, gypsum core board, or concrete core board unless otherwise accepted by Architect. Thickness shall be as required for attachment or to make material flashing flush or level with offsets and/or transitions, minimum three-fourths inch (3/4"). Proper selection of material is required to achieve UL guidelines.

2.11 SEALANTS

A. One-part Urethane Sealant: Sealant for use at coping joints, reglet joints, etc., shall be a one-component, high performance, non-priming, non-sag, gun grade elastomeric polyurethane sealant designed for use in active exterior joints, ASTM C 920, shall meet the following physical and performance properties, SONOLASTIC® NP 1™ as manufactured by BASF Construction Chemicals, LLC, or approved equal.

Properties	Results	Test Methods
Movement capability, %	±35	ASTM C719
Tensile strength, psi (MPa)	350 (2.4)	ASTM D412
Tear strength, pli	50	ASTM D1004
Ultimate elongation at break, %	800	ASTM D412
Rheological, at 120° F (49° C) (sag in vertical displacement)	No sag	ASTM C639
Extrudability, 3 seconds	Passes	ASTM C603
Hardness, Shore A		ASTM C661
At standard conditions	25 – 30	
After heat aging (max Shore A: 50)	25	
Weight loss, after heat aging	3%	ASTM C792
Cracking and chalking, after heat aging	None	ASTM C792
Tack-free time, hrs, (maximum 72 hrs)	Passes	ASTM C679
Stain and color change	Passes (no visible stain)	ASTM C510
Bond durability,* on glass, aluminum, and concrete ±35% movement	Passes	ASTM C719
Adhesion* in peel, pli (min. 5 pli)	30	ASTM C794
Adhesion* in peel after UV radiation through glass (min. 5 pli)	Passes	ASTM C794
Artificial weathering, Xenon arc, 250 hours	Passes	ASTM C793
Artificial weathering, Xenon arc, 3,000 hours	No surface cracking	ASTM G26
Water immersion, 122° F (50° C)	Passes 10 weeks with movement cycling	ASTM C1247

*Primed for water immersion dictated by ASTM C920.

B. Silyl-terminated Polyether Sealant: Sealant shall be a thermosetting, solvent free, non-slump, self-fixturing, multipurpose structural sealant which shall meet the following physical and performance properties, M-1 as manufactured by Chem Link, Inc., or approved equal.

Properties	
Specific Gravity	1.62 (13.5 lbs./gallon)
Viscosity	800,000+ cps Brookfield RTV, TF spindle, 4 rpm 73° F.
Shear Strength (ASTM D-1002)	400 psi+ (7 day ambient cure)
Elongation @ break (ASTM D-412)	400-550% (7 day ambient cure)
Hardness Shore A (ASTM C-661)	45 ± 3
Tack free time (ASTM C-679)	20 minutes
Low temperature flex ASTM D-816)	Minus 10° F pass 1/4" mandrel
Slump (sag) (ASTM C-697)	Zero slump
Shrinkage (ASTM D-2453)	No measurable shrinkage (after 14 days)
Service temperature	-40° F to 200° F continuous service

2.12 FASTENERS

A. Fasteners and fastening plates or bars shall be as recommended by the fastener manufacturer for the specific application.

B. Refer to Roof Board Insulation Specification Section 07 22 16 for further information.

2.13 ROOFING AGGREGATE

A. ASTM D 1863 covers the quality and grading of crushed stone and water worn gravel suitable for use as coarse mineral aggregate.

B. General Characteristics of Crushed Stone and Gravel: The stone and gravel at the time of application shall be hard, durable, surface dry (up to 2%) by weight moisture content), free of clay, loam, sand, or other foreign substances, and shall conform to size grading and property requirements.

C. Grading: The aggregate shall conform to sieve analysis as follows:

Sieve	Total Passing
3/4"	100
1/2"	90 to 100
3/8"	40 to 70
No. 4	0 to 15
No. 8	0 to 5

D. Physical Property Requirements:

Moisture, crushed stone and gravel	2.0% max.
Unit Weight (loose)	60 lbs./cu. ft., min.
Dust	0.5% max.
Hardness, amount passing No. 5 (3.36 mm) sieve when tested in accordance with ASTM D 1865	20% max.

2.14 ASPHALT ROOF PRIMER

A. Quick-dry asphalt-based primer for priming of asphalt roof surfaces or approved equal.

ASTM	D 41
Flash Point	105° F
Viscosity at 80° F (ASTM D 217)	50-60 K.U.
Weight per gallon	7.4 pounds
Drying time (to touch)	Min. 4 hours

2.15 FIBERGLASS COATED MEMBRANE

A. A non-rotting, non-absorbent woven fiberglass membrane having a vinyl coating designed for membrane reinforcement for all roof repairs. Compatible with either tar or asphalt bitumens, having ten (10) open-weave squares per inch.

2.16 ROOF DRAINS

A. Refer to Specification Section 07 72 00 Roof Accessories for strainer types.

B. Shall be minimum four inch (4"), or sized to match existing.

C. Lead Flashing: Shall be four pound (4#) lead, minimum thirty inches by thirty inches (30" x 30"), used for flashing of internal drains.

2.17 ASPHALT PLASTIC ROOF CEMENT

A. Trowel-applied mastic used on flanges of gravel stops, stacks, vents, and similar applications, or approved equal.

ASTM	D 4586
Flash Point	105° F
Weight per gallon (approximate)	11 lbs.
Viscosity @ 80° F (ASTM D 217)	270-330
% Non-Volatile (Fed. Test Method 141)	70% Min.
% Specially Processed Bitumen	30% Min.
% Total Solids, by Volume	75% Min.
Dry film thickness of 1 gal./15 sq. ft.	85 Mils
Drying time	2 to 3 days
Service Temperature, Extended Exposure	-20° to +150° F
Resistance to Oils & Solvents	Poor
Resistance to Sunlight	Good
Resistance to Chemicals	Good
Effects of Weathering	Slight chalking
Water Resistance	
Under Good Drainage Conditions	Excellent
Under Continuous Submersion	Fair

2.18 ALUMINUM ROOF COATING WHERE REQUIRED BY MANUFACTURER

A. Aluminized heat reflective roof coating, VOC compliant, containing three pounds (3#) per gallon of aluminum paste pigment, or approved equal.

ASTM	D 2824, Type III
Flash Point (ASTM D 93)	100° F Min.
Weight per gallon (approximate)	9.5 lbs.
Drying time	Overnight
Viscosity @ 80° F (ASTM D 562)	120-145 K.U.
% Non-Volatile (Fed. Test Method 141)	55% Min.
% Specially Processed Asphalt	25% Min.
% Polished Aluminum Leafing Paste	32%
Type of Aluminum Paste, TT-P-320D, Type II	Class B
% Total Solids, by Volume	38%
Film Thickness of 1 gal./100 sq. ft. (Less absorption by surface)	6 Mils
Service Temperature, Extended Exposure	-20° to +180° F
Resistance to Oils, Solvents & Chemicals	Poor
Resistance to Sunlight	Excellent
Effects of Weathering	Very Slow Erosion
Water Resistance	
Under Good Drainage Conditions	Excellent
Under Continuous Submersion	Poor

2.19 LEAD JACKS

A. Shall be four pound (4#) lead, and of dimensions required to completely cover existing plumbing stack.

2.20 PITCH PAN SEALANT

A. Pitch pan sealant shall be coal-tar elastomeric urethane which shall meet the following physical and performance properties, or approved equal.

Test	Typical Value	Test Method
Uniformity	Pass	ASTM D 4479
Elongation	450%	ASTM D 2370
Solids by Weight	98.5%	ASTM D 4479
Density	10.6 lbs/gal.	ASTM D 1475
Viscosity	20,000 – 25,000 cps	ASTM D 2196
Flash Point	250°F minimum	ASTM D 93
VOC	25 g/l	ASTM D 6511
Asbestos Content	0%	EPA 600/R-93/116

2.21 PIPE SUPPORTS

A. Refer to Specification Section 07 72 00 Roof Accessories for strainer types.

2.22 ROOF PLAQUE

A. Contractor shall provide a sixteen inch by sixteen inch (16" x 16") metal plaque which shall contain the information listed below. Fasteners to attach plaque shall be stainless steel, Location of plaque to be determined by Architect.
   1. Architect name, phone number.
   2. School district phone number.

3. School district emergency phone number.
4. Contractor name, phone number.
5. Subcontractor name, phone number.
6. Roof Consultant, name, phone number.
7. Roof system, warranty information.
8. Roof Manufacturer, phone number.

2.23 EXTERIOR ROOF ACCESS LADDER

A. Refer to Specification Section 07 72 00 Roof Accessories for strainer types.

2.24 TERMINATION/PRESSURE BARS

A. Aluminum strip shall be extruded channel bar with a mill finish, width one inch (1"), thickness 0.100" ± .008", leg height one-fourth inch (1/4") top and bottom, leg angle ninety degrees (90°), for perimeter and curb anchorage, having predrilled holes six inches (6") on center, as manufactured by Olympic Fasteners, or approved equal.

2.25 ELASTOMERIC SEALANT

A. Multi-Component Polysulfide Sealant: Except as otherwise indicated, provide manufacturer's standard, non-modified, 2-or-more-part, polyurethane-based, elastomeric sealant; complying with either ASTM C 920, Type M, Class 25, or FS TT-S-00227E, Class A; self-leveling grade/type where used in joints of surfaces subject to traffic, otherwise non-sag grade/type, or approved equal.

B. Durability: Less than 0.5 square inch adhesion/cohesion loss for three (3) samples of both mortar and aluminum; ASTM C 719 test procedure.

C. Adhesion in Peel: Fifteen pound (15#) peel strength and 10% maximum loss of bond to substrate; ASTM C 794.

D. Bituminous Modification: Where joint surfaces contain or are contaminated with bituminous materials, provide manufacturer's modified type sealant which is compatible with joint surfaces (modified with coal-tar or asphalt as required).

2.26 SELF-ADHERING UNDERLAYMENT FOR TEMPORARY WATERPROOFING

A. A premium heavyweight, minimum 60 mil, self-adhering underlayment, to use as a temporary waterproofing barrier.

2.27 EXPANDED POLYETHYLENE JOINT FILLER

A. Provide flexible, compressible, closed-cell, polyethylene of not less than 10 psi compression deflection (25%); except provide higher compression deflection strength as may be necessary to withstand installation forces and provide proper support for sealants, surface water absorption of not more than 0.1 pounds per square foot, or approved equal.

2.28 JOINT PRIMER/SEALER

A. Provide type of joint primer/sealer recommended by sealant manufacturer for joint surfaces to be primed or sealed.

2.29 BOND BREAKER TAPE

A. Provide polyethylene tape or other plastic tape as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape where applicable.

2.30 SEALANT BACKER ROD

A. Provide compressible rod stack of polyethylene foam, polyurethane foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable, non-absorptive material as recommended by sealant manufacturer for back-up of and compatibility with sealant. Where used with hot-applied sealant, provide heat-resistant type which will not be deteriorated by sealant application temperature as indicated.

2.31 DELIVERY AND STORAGE

A. All materials shall be delivered with appropriate carton and can labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions. Materials damaged in shipping or storage shall not be used.

2.32 PRECAUTIONS

A. Some of the indicated materials are extremely flammable and/or toxic. Use precautions indicated on can and carton labels.

2.33 MISCELLANEOUS MATERIALS

A. Other materials shall be as specified, or of the best grade for the proposed use, as recommended by the manufacturer of said product.

PART 3 - EXECUTION

3.01 REFERENCE

A. In the instance of a conflict between these specifications and those of the manufacturer and/or current NRCA, Underwriters Laboratory and IBC guidelines, the more stringent specifications (better quality or greater quantity of work) shall take precedence.

B. The manufacturer's Technical Specifications and current NRCA, Underwriters Laboratory and IBC guidelines shall be considered a part of this specification and shall be referred to for general application procedures and recommendations.

C. Application of materials shall be in strict accordance with the manufacturer's recommendations and current NRCA, Underwriters Laboratory and IBC guidelines, except where more stringent requirements (better quality or greater quantity of work) are shown or specified.

D. General Installation:
1. Comply with governing local, state, and federal regulations, safety standards, and codes.
2. Protect adjacent areas with tarpaulin or other durable materials.
3. Contractor shall prevent overspray, and be responsible for parking lot areas and/or adjoining areas not part of this contract.
4. Contractor shall be responsible for sealing, as required, all openings that may allow bitumen migration or drippage, i.e. pitch dams, envelopes, and filler strips.
5. Prepare surfaces according to manufacturer's or applicator's published instructions. All metal that is to receive bitumen, or come in contact with bitumen or adhesive, shall be first primed with appropriate primer. Any prefinished galvanized sheet steel that is to receive bitumen, or come in contact with bitumen or adhesive, shall be scored, scuffed or abraded before receiving primer application.
6. Use cleaning materials or primers necessary to render an acceptable surface/substrate.
7. All surfaces/substrates shall be clean and dry prior to application of materials.
8. Prior to application of felts and membrane, all foreign matter, gravel, etc., shall be removed from the insulation and/or substrate. Gravel or debris between the insulation/substrate and plies is not acceptable.
9. Prior to application of flashing membranes, substrate shall be clean and free of any previously installed roofing materials. Contractor shall ensure that all components of substrate be structurally sound before application of flashing materials.
10. Bitumen kettle shall have a fume recovery system, and visible thermometer to provide positive monitoring of the bitumen temperature when it is heated in accordance with manufacturer's instructions.
11. Ambient temperature shall be 40° F and rising.
12. The underlayment plies and field membrane are to be laid in the direction of maximum roof slope, working from bottom of slope toward ridge.
13. All roof areas will be picture framed with the 60 mil coal-tar elastomeric membrane (CTEM) as the system is being applied. The outer edge of the picture frame sheet shall extend approximately two inches (2") above the top of the cant. All end laps of the field sheets of the 60 mil coal-tar elastomeric membrane shall lap the picture frame sheet a minimum of eight inches (8") or the picture frame sheet side laps shall lap the field sheet a minimum of eight inches (8").
14. Wrinkles, buckles, kinks, and fishmouths are not acceptable when laying felt and membrane.
15. Dry voids of felt on felt or membrane on membrane are not acceptable.
16. All surfaces that are to receive the self-adhered membranes shall be primed with a fast drying asphaltic primer, except when self-adhered membrane is to be installed over a CTEM surface.

3.02 SUBSTRATE PREPARATION

A. Tear-off: Remove all existing roof assembly down to the roof deck or original substrate. Substrate shall be smooth, free of debris, sharp edges, and other surface irregularities prior to starting roofing application. Substrate repair shall be performed as required to minimum of NRCA standards.

B. Metal Decks:
1. All loose rust, bitumen, or other foreign material shall be removed from the deck before applying metal primer at the minimal rate of one and one-half (1-1/2) gallons per one hundred (100) square feet of area.
2. Deteriorated metal decking shall be repaired or replaced as required and as recommended by the deck manufacturer on a unit cost basis as approved by Architect.
3. The metal deck shall be of like kind, quality, gauge and configuration. The deck span shall not exceed that recommended by FM Global Bulletin 1-28.
4. If metal deck must be replaced:
   a) Erect metal decking as recommended by the SDI. Properly align and level on structural supports.
   b) Allow minimum three inch (3") bearing when supported by structural steel and minimum six inch (6") bearing when supported by masonry.
   c) Care shall be exercised in the selection of electrodes and amperage to provide positive welds and to prevent blowholes.
   d) Weld metal shall penetrate all layers of deck material at end laps and side joints and shall have good fusion to the supporting members.
   e) Side lap fasteners shall be No. 12, self-drilling, self-tapping screws.
   f) Install closure strips and angle flashings as required to close openings between deck and walls, columns and openings.
   g) Immediately after installation, touchup welds, burned areas and damaged spots with prime paint.
5. Expansion/control joints shall be installed so that no one area exceeds two hundred feet by two hundred feet (200’ x 200’).

3.03 CATEGORY II (NON-FRIABLE) ASBESTOS CONTAINING MATERIALS (ACM) REMOVAL

A. Owner and Contractor agree to exonerate, indemnify, defend, and hold harmless the roofing material manufacturer from and against all claims, demands, lawsuits, damages, expenses and losses incurred by Contractor’s removal of asbestos-containing materials from Owner’s building and work site. Contractor must conduct its operations according to applicable requirements including but not limited to those established by:
1. Occupation Safety and Health Administration (OSHA).
2. Environmental Protection Agency (EPA).
3. Department of Transportation (DOT).
4. State or Local Air Pollution Control Authorities/Agencies.
5. State or Local Solid Waste or Hazardous Waste Authorities/Agencies.
6. State or Local Health Department(s).
7. State or Local Building Code Authorities.
8. Other federal, state or local agencies or authorities.

B. Contractor or Owner shall perform appropriate inspections, surveys and file timely notifications to proper authorities prior to starting roof renovation or demolition activities. Inspectors, project planners, project managers, contractors and workers involved in the roof project shall have appropriate training, licenses and registrations. Contractor and Owner shall be responsible for determining and implementing regulatory compliance activities, including but not limited to work practices, engineering controls, personal protection, air monitoring, testing, hazard communication, material handling, record retention, and arranging for waste disposal/handling.

C. Contractor must file a Uniform Hazardous Waste Manifest from proper landfill site for each load of asbestos containing material removed. Copies must be sent to Owner and material manufacturer/specifier. Transportation of waste shall be in accordance with applicable Department of Transportation (DOT) requirements.

3.04 ASPHALT HEATING

A. Use low burner flames during initial melt-downs. Circulate asphalt after initial melt-down.
1. Maximum asphalt temperature shall be 25°F below the flash point.

B. Avoid prolonged heating of asphalt at high temperatures. Reduce the asphalt temperature to below 500°F if asphalt is not being used for periods of four (4) hours or more.

C. Kettle shall be free of contaminants.

D. Application rates: Bitumen quantities for waterstop/tie-offs, flashings, miscellaneous detail applications, and minimum kettle capacity are not included in application rates. To account for these factors, add approximately 25 percent additional bitumen on a total job average basis.

3.05 ROUGH CARPENTRY

A. Nailers shall be installed according to NRCA, Underwriters Laboratory, and IBC guidelines.

B. Wooden nailers shall be installed at gravel stops, drip edges, expansion joints, and on outside perimeter of building.

C. Gravel stop and drip edge nailers shall be the same height as the new insulation being installed where required.

D. Nailers shall be raised if necessary by anchoring an additional nailer of appropriate height to the existing nailer if the existing nailer is not to be replaced.

E. Expansion joint nailers shall extend upward a minimum of eight inches (8") above finish roof height.

F. Where parapet wall exists, specified vertical wall shimming material shall be installed beginning at roof height up to a minimum of twelve inches (12”) above finished roof surface, or as detailed, to provide substrate for horizontal termination of roof to wall flashing system.

G. Any lumber or shimming required for attachment, or to make material flashing flush or level with offsets and/or transitions, shall be incorporated in these specifications.

3.06 CANTS

A. Provide full 45 degree cant strips (no partials) at all intersections of vertical and horizontal surfaces, such as walls, parapet walls, curbs, expansion joints, etc., and as recommended by membrane manufacturer.

B. Cants shall provide a four (4) inch rise above the roof's surface.

C. Toe of cant shall be level with the surface to receive new roof membrane and in all cases anchored according to NRCA, Underwriters Laboratory, and IBC guidelines.

D. Cant strips shall be installed at the intersection of the deck and all vertical surfaces.

E. If a wood cant is used where insulation exists, cant shall be toe nailed into treated wood nailer under cant the same height as insulation.

3.07 INSULATION - GENERAL

A. Manufacturer's Instructions: In regard to attachment, the manufacturer's instructions or specifications shall determine the suitability for an application. Installation must meet ASCE 7 criteria and meet local governing building codes.

B. Refer to Roof and Deck Insulation Specification Section 07 22 16 for further information.

3.08 APPLICATION OF UNDERLAYMENT PLY SHEETS

A. Coverboard shall be covered with one (1) ply of nominal eighty-five (85) mil, smooth surfaced, SBS modified asphalt, glass reinforced base sheet, meeting ASTM D 6163, Type 1, Grade S fully adhered as follows.

B. All layers shall be solid mopped in a uniform and continuous manner at the nominal rate of thirty pounds (30#) ± 20% per one hundred (100) square feet using steep asphalt Type IV as required by slope, properly heated and applied within the Equiviscous Temperature (EVT) range.

C. Apply adhesive no more than ten (10) feet ahead of each roll being embedded.

D. Broom each ply from the unmopped side before adhesive cools. Ensure complete and continuous seal and contact between bitumen and ply sheets without wrinkles, including ends, edges, laps, fishmouths, or blisters. Broom width shall be thirty-four inches (34") minimum. Avoid walking on plies until adhesive has set.

E. Specified layers shall be applied in accordance with the manufacturer's recommendations and in accordance with general practices as set forth by the NRCA Roofing Manual.

F. Use starter sheets at all edges as required. Two-ply underlayment requires a nineteen inch (19") starter sheet.

G. If slope dictates, underlayment plies shall be installed using the strapped method going with the slope as required by membrane manufacturer.

3.09 APPLICATION OF FINISH FIELD SHEET

A. Unroll at least ten feet (10') of the 60 mil coal-tar elastomeric membrane (CTEM) and position the sheet. The properly heated steep asphalt (per specification) should be applied at the rate of approximately thirty pounds (30#) ± 20% per one hundred (100) square feet with a mop just ahead of the roll of the CTEM to form a pool of asphalt into which the membrane is to be rolled. The roll of CTEM should push a puddle of asphalt ahead of it with no voids. Care should also be taken not to trap air under the membrane. The pool of asphalt in front of the roll will eliminate entrapped air.

3.10 FIELD LAP SPLICE

A. Coal-tar elastomeric membrane (CTEM) shall be installed as above with side lap minimum three inches (3"), no maximum. End laps shall be minimum eight inches (8"), no maximum, and staggered a minimum of four feet (4'), no maximum.

B. Field Lap Splice with Bitumen: The membrane shall be laid in the same direction as the base sheet, but the laps shall not coincide with the base sheet. While asphalt is still hot, pressure shall be applied to the laps with a trowel or similar tool to ensure complete contact with the asphalt, and a squeeze-out of bitumen shall be visible. The side laps in the 60 mil coal-tar elastomeric membrane (CTEM) should not be located above those in the base sheet, but located to one side or other to avoid excessive ply build-up. Lack of or no side lap bitumen squeeze-out is not acceptable. Contractor shall cut away dry material to dry material, and install a minimum of twelve inch (12") wide membrane overlaid in hot bitumen.

C. Field Seams/Laps:
   1. All laps/seams, cross seams, T-joints, seams/openings at penetrations, or other details shall be sealed and checked daily, no variance.
   2. Laps: All laps shall be straight and free of wrinkles and/or fishmouths, no variance.

3.11 BACKNAILING/STRAPPING

A. On slopes greater than one inch (1") in twelve inches (12"), refer to NRCA and/or manufacturer's guidelines for backnailing procedures and follow the more stringent guidelines for all specified materials.

Slope	Interply& Top Pour	Backnail	Strap
0 - ½" per 12"	Type IV	No	No
½" - 2" per 12"	Type IV	Yes	Strap if possible
2" - 3" per 12"	Type IV	Yes	Yes

3.12 PERIMETER FASTENING

A. Wood nailers are required for perimeter gravel stops or drip edges. Field membrane and all plies shall be mechanically fastened on the vertical face of nailer, twelve inches (12") on center maximum.

3.13 BASE FLASHING (APPROXIMATELY 8" IN HEIGHT MINIMUM)

A. Base flashings shall be installed using the flashing membrane, with length of run not to exceed twenty linear feet (20').

B. Wooden nailers or curbs shall be installed at all edges and openings in the roof, mechanically fastened to the deck.

C. Cant strips shall be installed at the intersection of the deck and all vertical surfaces.

D. The roofing field membrane shall extend up over and two inches (2") above the top of cant strips at all vertical intersections or out to the roof's edge.

E. All existing substrates receiving flashing membrane shall be clean and primed with primer, prior to application as required.

F. All flashings shall be mechanically fastened with a termination bar a maximum of six inches (6") on center, be a maximum of eight inches (8") above finished roof height, extend a minimum of four inches (4") onto the field of horizontal roof membrane, and not exceed twenty linear feet (20') of run in length.

G. After proper termination of the base flashing at a minimum eight inch (8") height (or maximum eighteen inch (18") height), a saw cut reglet with counterflashing / surface mounted counterflashing with a secondary counterflashing above shall be installed according to NRCA and SMACNA guidelines.

H. All vertical flashing butted seams of the flashing membrane shall be covered with a 6" trim strip and hot-air welded.

I. All flashing membrane shall be adhered with flashing bonding adhesive to the vertical substrate and hot-air welded to the field of roof membrane; hot-air weld 6" trim strip over the butted vertical seams/laps.

J. Flashing welds shall be a minimum two inch (2") width, no maximum.

K. Hot-Air Welding of Flashing:
   1. When using a hand-held hot-air welder, the seams should be pressed together using a hand-held roller. The speed and temperature settings of the welding equipment can be affected by the weather conditions at the site of application, therefore, these parameters should be set by trial and error using two (2) pieces of the flashing membrane. Minimum width of hot-air weld two inches (2"), no maximum.
   2. Lay the membranes together and apply pressure to the welded seam to ensure full adhesion.
   3. Allow the seams to set fully, and probe the entire length for voids. Reseam voids immediately with a hot-air gun and roller.

L. All hot-air welded seams/laps shall be tested daily with a probe for integrity, no variance.

3.14 VERTICAL WALL FLASHING (FOR USE APPROXIMATELY 8"-18" ABOVE THE FINISHED ROOF LINE AND EXTENDING UPWARD)

A. Flashing membrane shall be installed on the vertical beginning a minimum of eight inches (8") above the finished roof line (where the base flashing is terminated), with length of run not to exceed twenty feet (20'). Flashing shall be installed in strict accordance with the manufacturer's recommendations.

B. The termination bar used to terminate the minimum eight inch (8") high base flashing shall be used to terminate the lower edge of the vertical flashing. This will cause the termination bar to be buried at the termination point. Care should be taken to ensure the top edge of the base flashing and bottom edge of the vertical flashing are both secured.

C. All existing substrates receiving flashing membrane shall be clean and primed with asphalt primer, prior to application.

D. All substrates receiving welded-seam flashing membrane shall be clean and primed with primer, prior to application when applicable.

E. The vertical wall flashing membrane shall be set in flashing bonding adhesive according to manufacturer's guidelines.

F. All vertical flashing lap seams of the flashing membrane shall be hot-air welded.

G. Flashing laps shall be minimum two inch (2") width, no maximum. Hot-air weld of flashing lap shall be minimum two inch (2") width, no maximum.

H. Immediately following the laying of the flashing membrane, it shall be pressed or rolled in the width direction of the membrane. This will prevent excessive entrapment of air beneath the membrane. The pressing or rolling shall be in the width direction and with the laps so as <u>not</u> to buck the laps.

I. Any flashing extending further than eighteen inches (18") up onto a vertical surface shall be installed using the strapped method and must be fastened with a termination bar or installed up and over the parapet wall and fastened to the nailer on the outside of the wall.

J. The flashing membrane shall be run up the wall in sheet widths, run under the coping cap and be terminated on the outside of the wall six inches (6") on center; then the coping cap shall be reset. All side laps are to be hot-air welded.

K. Hot-air Welding Laps:
   1. When using a hand-held hot-air welder, the seams should be pressed together using a hand-held roller. The speed and temperature settings of the welding equipment can be affected by the weather conditions at the site of application, therefore, these parameters should be set by the contractor by using two (2) pieces of flashing membrane. Minimum width of hot-air weld shall be two inches (2").
   2. Lay the laps together and apply pressure to the welded seam to ensure full adhesion.
   3. Allow the seams to set fully, and probe the entire length for voids. Reseam voids immediately with a hot-air gun and roller.

L. <u>All hot-air welded seams/laps shall be tested daily with a probe for integrity,</u> no variance.

M. Any lumber or shimming required for attachment or to make material flashing flush or level with offsets and/or transitions shall be incorporated in the flashing specifications.

3.15 PROJECTION FLASHINGS

A. Plumbing Vents: Soil vent stack pipes shall receive new lead flashings installed in strict accordance with practices set forth in the NRCA Roofing Manual. The lead shall be carried up and over the top of the stack, and crimped down into the pipe to form a watertight seal. Projections that cannot be sealed thus should be boxed in and flashed as recommended by the roof membrane manufacturer.

B. Square Projections: Lay the 60 mil coal-tar elastomeric membrane (CTEM) up to the projection, and cut membrane so that it will extend twelve inches (12") beyond the projection. Cut a slit in the membrane to correspond with the position of the projection, and lay the membrane in hot asphalt. Apply another layer of membrane in exactly the same fashion, but from the opposite direction. For metal flange-type projections, after doing above, strip in with six inch (6") strips of membrane.

C. Round Projections: Cut membrane square and eighteen inches (18") from perimeter of projection. Slit square membrane with an "X" of proper size to ensure a close fit and positive seal. Place over projection, and adhere to clean membrane already on the roof. Cut a six inch (6") piece of membrane to apply as a collar, and secure with an all stainless steel clamp.

3.16 CURB FLASHINGS

A. The flashing substrate shall be free of any dirt and loose material.

B. The underlayment ply or plies and the coal-tar elastomeric membrane (CTEM) shall be brought to two inches (2") past the top of the cant strip and adhered.

C. Starting on the roof at least six inches (6") from the roof side edge of the cant strip, adhere two (2) plies of Type IV ply sheet extending over the cant and up the vertical a minimum of eight inches (8"). Each lap of the ply sheet shall be a minimum of three inches (3").

D. Over the Type IV ply sheet starting on the roof at least eight inches (8") from the roof side edge of the cant strip, adhere the coal-tar elastomeric membrane (CTEM) extending over the cant and up the vertical a minimum of eight inches (8"). Each lap of the coal-tar elastomeric membrane (CTEM) shall be a minimum of three inches (3"), hot-air welded, and shall not coincide with the laps of the underlayment sheet.

E. Fasten the top edge of the flashings on six inch (6") centers using approved termination bar and fasteners.

F. An NRCA-approved metal counterflashing shall extend down over the flashing a minimum of four inches (4").

3.17 EDGING FLASHINGS

A. An NRCA-approved gravel stop/fascia system shall be installed in strict accordance with published instructions to meet ANSI-SPRI ES-1 requirements.

B. The 60 mil coal-tar elastomeric field membrane (CTEM) shall extend a minimum of one inch (1") below the base of the nailer, and be fastened six inches (6") on center. A metal edge of proper gauge and dimensions shall be mechanically fastened, using a continuous clip fastened six inches (6") on center, to the wood nailer over the membrane. The metal shall have a minimum of a three inch (3") flange, set in asphalt mastic and fastened into nailer a minimum of six inches (6") on center, and a minimum of a four inch (4") fascia (match existing). The lower elevation of the metal edge shall extend a minimum of one inch (1") below the juncture of the bottom edge of the wood nailer and adjoining wall surface. The metal edge shall have a minimum of one inch (1") gravel stop.

C. All metal coming in contact with bituminous material shall be primed. Strip metal edge flange with one strip of Type IV fiberglass felt set in hot bitumen extending inward from the lip of the gravel guard a minimum of three inches (3") past metal flange. Strip in fiberglass felt with 60 mil coal-tar elastomeric membrane (CTEM) flashing from the lip of the gravel guard to a minimum of three inches (3") past the edge of the fiberglass underlayment using hot bitumen. At the leading edge of the CTEM along the lip of the gravel guard, a liberal bead of silyl-terminated polyether sealant shall be applied.

1. NOTE: If internal flange of metal edge detail is tapered, CTEM self-adhered membrane shall be used in lieu of the 60 mil CTEM. Any laps of the CTEM self-adhered membrane shall be covered with a four inch (4") wide piece of the 60 mil CTEM field membrane centered over the lap, hot-air welded and extending the full length of the lap. At the top leading edge where the self-adhered CTEM membrane does not have a selvedge edge for welding CTEM to CTEM, a liberal bead of silyl-terminated polyether sealant shall be applied.

D. The coal-tar elastomeric membrane (CTEM) finishing strip shall have a minimum of four inch (4") lap joints that are staggered from any joints in the gravel guard.

3.18 PIPING/CONDUIT

A. Piping/conduit shall be raised to NRCA recommended heights, and new supports furnished. Permanent supports shall be installed upon pads approved by membrane manufacturer. Coordinate work with Architect.

B. All gas lines, piping, and conduits shall be coated with industrial grade yellow paint.

3.19 PIPE/EQUIPMENT SUPPORTS

A. Refer to specification section 07 72 00 Roof accessories

B. All gas lines, piping, and conduit must be supported on specified stands or hangars.

C. Supports shall be attached to pipes with oversized strapping.

D. Designated pipe/equipment supports shall be removed and replaced with new.

E. Verify that roof surface is smooth and clean to extent needed to receive materials. Surface shall be cleaned by removing any loose gravel and any foreign matter.

F. Install support systems in accordance with manufacturer's instructions and approved shop drawings. Accurately locate and align pre-fabricated pipe supports in locations specified as per approved shop drawings. Pipe supports shall be placed not to exceed ten feet (10') on center and within two feet (2") of all elevation changes, intersections, and corners.

G. Supports shall be set on a double layer of membrane, adhered to the roof surface using specified silyl-terminated polyester sealant, unless noted otherwise by support manufacturer.

H. Provide bond breaker between dissimilar metals.

3.20 DRAINS

A. Refer to specification section 07 72 00 Roof Accessories

B. All drain work, including bowl and lines, shall be performed by licensed professional master plumber.

C. Existing drains which cannot be properly detailed shall be replaced with specified cast iron drain bowls and strainers, including all new drain accessories, as determined by Architect. Size to match existing drain system. Install watertight to existing lines. Follow drain manufacturer's installation requirements.

D. Replace all non-cast iron drains with new cast iron drain bowl and strainer.

E. Install new lead and new roof membrane at all drains in accordance with the detailed drawing.

F. Inspect and test drain and drain lines prior to start of work. Open if blocked or clogged, and replace all broken or missing drain components and lines.

G. Replacement Drains: Size to match existing drain system. Install watertight to existing lines. Follow drain manufacturer's installation requirements.

H. Remove strainer and clamping ring. All broken or missing roof drain strainers shall be replaced, and reset.

I. Inspect every drain after roofing to ensure proper seal to leader line.

J. Verify in writing to Architect that all drains and lines are free flowing and watertight prior to substantial completion. Comply with local plumbing codes.

3.21 DRAIN FLASHINGS

A. Build a sump to the drain and create a smooth transition by installing tapered insulation around the drain. The slope of the drain sump shall not exceed one inch (1") per horizontal foot (8%). The drain sump should be eight foot by eight foot (8' x 8') sump minimum per roof plans.

B. All drains shall receive new lead flashings. Flashings shall be installed in strict accordance with manufacturer's recommendations and with practices as set forth in the NRCA Roofing Manual.

C. Drain shall be covered with the 60 mil coal-tar elastomeric roofing membrane (CTEM) and underlayment plies as specified, slitting the membranes over the drain hole with an "X".

D. Lead flashings as specified shall be installed and primed with asphalt base primer and allowed to dry prior to application of flashing layers.

E. Lead flashing shall be covered with flashing membranes consisting of one layer of fiberglass ply sheet and one layer of 60 mil coal-tar elastomeric roofing membrane (CTEM). Each layer shall be installed in a solid bed of asphalt bitumen as specified and shall extend a minimum of twelve inches (12") past the outer edges of the three by three foot (3' x 3') lead flashing. Flashing membranes and lead flashing shall be slit over the drain hole with an "X", cutting excess material from the interior of the drain bowl.

3.22 DRAIN ACCESSORIES

A. Refer to Specification section 07 72 00 Roof Accessories

3.23 EXPANSION JOINT

A. Expansion joints at walls and field of the roof shall be curbed as outlined in accordance with NRCA and SMACNA guidelines. The curbs will be flashed as outlined above in Curb Flashings.

3.24 SURFACE FINISH

A. Flood Coat and Aggregate: Aggregate shall be applied at the minimum rate of five hundred pounds (500#) per one hundred (100) square feet set in hot (liquid) flood coat of steep asphalt Type IV applied at the minimum rate of sixty pounds (60#) per one hundred (100) square feet.

B. Flashing Coating: All vertical membrane flashings above the toe of the cant that are not the white self-adhered welded-seam flashing shall be aluminum coated at the minimum rate of one and one-half (1-1/2) gallons per one hundred (100) square feet to achieve full and total coverage eliminating any shadowing.

3.25 MEMBRANE PROTECTION

A. Walk Way Pads: Install manufacturer's walk way pads continuously on each side of each air-handling/mechanical unit on the roof in accordance with the manufacturer's recommended procedures.

B. Where equipment pads, wood sleepers, or walkway slabs are to be installed over the roofing membrane, an additional layer of the roofing membrane shall be installed between the roofing membrane and the pad, sleeper, or slab. Due caution shall be exercised to prevent roofing membrane damage during placement. Where required, membrane shall be welded to field membrane to prevent slippage.

3.26 ROOF PLAQUE

A. Metal plaque shall be installed on the underside of each roof hatch or on the inside of the maintenance room door. Location of plaque to be determined Architect.

B. Plaque shall be fastened with stainless steel screws that are short enough to not penetrate outer surface of hatch or door where mounted.

3.27 INSTALLATION OF EXTERIOR ROOF ACCESS LADDER

A. Examination:
   1. Coordinate anchorages. Furnish setting drawings, templates, and anchorage structural loads for fastener resistance.
   2. Do not begin installation until supporting structure is complete and ladder installation will not interfere with supporting structure work.
   3. If supporting structure is the responsibility of another installer, notify Architect of unsatisfactory supporting work before proceeding.

B. Installation: Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction.

C. Protection:
   1. Protect installed products until completion of project.
   2. Touch-up, repair or replace damaged products before Substantial Completion.

3.28 TERMINATION OF NEW ROOF TO EXISTING

A. The final juncture of the new roof shall consist of an NRCA recommended area divider suitably flashed and sealed for a permanent watertight installation. A water cutoff shall be incorporated into the termination to prevent water entering the existing roof from migrating into the new roof system.

3.29 OVERNIGHT SEAL

A. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occurs to structure or interior areas of existing building.

B. Installation shall be performed according to accepted roofing practice as outlined in the NRCA Roofing Manual.

3.30 MEMBRANE CLEANING

A. After all membrane has been installed, it shall be cleaned with a cleaning agent compatible with the membrane to return the membrane to like new appearance.

3.31 PROTECTION

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

B. Where traffic must continue over finished, installed roofing system, protect membrane, underlayment accessories and finishes from damage.

3.32 MEMBRANE PROTECTION

A. Where equipment pads, wood sleepers, or walkway slabs are to be installed over the roofing membrane, an additional layer of the roofing membrane shall be installed between the roofing membrane and the pad, sleeper, or slab. Due caution shall be exercised to prevent roofing membrane damage during placement. Where required, membrane shall be welded to field membrane to prevent slippage.

END OF SECTION 07 53 00

SECTION 07 61 13
STANDING SEAM METAL ROOF SYSTEM

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: The contractor shall provide all material, labor, and administration and other items to provide a complete standing seam metal roof system complying with performance requirements indicated and capable of withstanding structural movement, thermally induced movement and exposure to weather without failure or infiltration of water into the building interior.

B. Coordinate standing seam metal roof system with roofing substructure work.

C. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary General Conditions, and Sections in Division 1 of these Specifications.

1.02 SECTION INCLUDES

A. Preformed and prefinished standing seam metal roof system with continuous mechanically seamed ribs, concealed clips and fastening devices.

B. Color coordinated ridge, hip, valley, gable, eave, corner, rake, headwall, counterflashings and miscellaneous flashings and attaching devices.

C. Provide concealed clips, fasteners, closures and factory and field applied sealants as necessary to meet design criteria and ensure a weathertight installation.

D. Bituthane membrane roofing underlayment.

E. Factory Fabricated Polyisocyanurate nailbase clad rigid insulation Refer to 07 22 16 Roof Board Insulation for nail base configuration.

1.03 SYSTEM DESCRIPTION

A. Design Requirements:
   1. The standing seam metal roof system, including: panels, flashings, attachment clips and attachment screws shall be designed by the metal roof system manufacturer per to meet the following design criteria:
      a. 2015 version of the International Building Code, (IBC-2015).
      b. A basic wind speed of 130 mph.
      c. Listing of applicable loads by roof zones (interior, edges and corners).
      d. The building importance factor is one - Essential Facilities.
      e. Roof snow load is. per local requirements as determined by Panel Manufacturer.
      f. The building exposure factor is "C", open terrain.

2. The standing seam metal roof system manufacturer shall provide an engineered analysis of the roofing system, sealed by a registered Structural Engineer employed by the manufacturer and licensed in the State of Texas, verifying that the product and attachment methods will resist wind pressures imposed upon it pursuant to the design criteria and that the roofing system fully complies with all specified requirements.
3. The panel system shall bear fully documented proof that it has been independent laboratory evaluated using the U.S. Army Corps of Engineers Guide Specification (CEGS) 07416.
   a. Testing shall include establishment of ultimate and allowable system uplift capacities for both the "field" and "areas of discontinuity".
   b. "Proof" shall be defined as both the manufacturer and the product being included in the document entitled: "List of Approved Standing Seam Metal Roof Systems" as published by the U.S. Army Corps of Engineers.
4. Provide factory preformed panel system that has been pretested and certified by manufacturer to comply with specified requirements under installed conditions.
5. Provide factory engineered and tested end lap (splice) details at roof third points, per ASTM 2140 water immersion testing.
6. Provide continuous mechanically seamed ribs that inherently increase load span capability, stiffness and flexural stress handling capacity.
7. Provide continuous butyl sealant within the confines of the female flange.
8. Provide panel that has been tested and approved for a Class 4 Impact (Hail) resistance rating per UL 2218. Listing shall be present on the UL website (Refer to Underwriters Laboratories website at www.ul.com).
9. On-site or field manufactured panels are prohibited. Field curving of pre-manufactured panels is acceptable.

B. Structural Requirements:
1. Panel structural properties determined in accordance with latest edition of American Iron and Steel Institute's "Cold Formed Steel Design Manual," using "effective width" concepts.
2. Wind uplift design for roof assemblies shall be calculated by the standing seam metal roofing system manufacturer per ASTM E 1592. Calculations shall include establishment of ultimate and allowable roof system uplift capacities for both the "field" and "areas of discontinuity".
3. Provide confirmation of positive and negative buckling moments and uplift capacity determined by full-scale tests.

C. Substrate Criteria:
1. Standing Seam Metal Roofing System: Engineer standing seam metal roof system installed over Bituthane membrane underlayment and Polyisocyanurate Nailbase clad rigid insulation over metal decking that is capable of withstanding the design loads when applied at 90° to the surface and spaced as shown on the approved shop drawings.
2. High temperature Waterproof Membrane Underlayment: Apply waterproof bituthane membrane under entire roof surface per manufacturers written instructions.
3. Four inch (4") Polyisocyanurate Nailbase clad Rigid Insulation: Attach Polyisocyanurate Nailbase R-30 clad Rigid Insulation to metal decking as per the manufacturers written instructions and in the required pattern to resist the design loading.

D. Environmental Requirements: Actual independent laboratory certified test results must be submitted.
   1. Resistance to air infiltration (Tite-Loc-Plus): .002 cfm per linear foot of joint when tested in accordance with ASTM E 1680 at static test pressure differential of 12.00 psf.
   2. Resistance to water infiltration (Tite-Loc-Plus): No leakage through panel joints when tested in accordance with ASTM E 1646 at static test pressure differential of 12 psf.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's specifications, engineered detail drawings, and installation instructions.

B. Shop Drawings:
   1. Submit three (3) sets of full size (24"x36") approval / design drawings produced by the standing seam metal roof system manufacturer indicating thickness and dimensions of parts, fastenings and anchoring methods, details and locations of seams, transitions and other provisions necessary for thermal expansion and contraction.
   2. Indicate roof terminations, clearly showing flashings and change of direction caps.
   3. Clearly indicate locations of field and factory applied sealant.
   4. Show locations, spacing patterns and types of hold-down clips and fasteners.
   5. Provide (24"x36") blue line or Auto CAD produced drawings provided by the standing seam metal roof system manufacturer showing a complete roof plan, roof panel layout, and cross section details for every individual condition of the entire roof system.

C. Samples:
   1. Submit two (2) samples, twelve inch (12") long by full width of panel, showing proposed metal gauge and seam profile.
   2. Submit color samples on metal for Architect's selection from manufacturer's full range of color offerings including custom (metallic colors) colors.

D. Test Reports: Submit verification the panel system meets the Environmental Conditions for the indicated test pressures and performance listed for Air and Water Infiltration.

E. Engineered Design Calculations:
   1. Submit panel system manufacturer's design calculations verifying the panel system meets the specified building code as defined in Section 1.03 System Description, A. Design Requirements listed above.
   2. Design calculations shall be sealed by a registered Structural Engineer employed by the standing seam metal roof system manufacturer and licensed in the State of Texas.

F. Certification:
   1. Submit manufacturer's certification that materials and finishes meet specified requirements.
   2. Submit written verification of panel Applicator's factory installation training performed by the standing seam metal roof system manufacturer and a copy of the Panel Applicator's "Authorized Applicator" certificate.

1.05 QUALITY ASSURANCE

A. Manufacturer's Qualifications:

1. Minimum twenty (20) year's experience in the fabrication of standing seam metal roof systems on projects of similar size and scope. Upon request, submit a minimum of five (5) project references for Architect's review. List project address, date of installation, Architects and Owner's name and telephone numbers.
2. No other manufacturer of standing seam metal roof systems will be accepted without prior written approval of the Architect and based upon the manufacturer verifying the product can meet or exceed all performance criteria listed in these specifications.
3. Requests to be listed as an approved manufacturer must be submitted in writing a minimum fifteen (15) days prior to bid date accompanied by product literature, technical information, sealed engineer's calculations verifying conformance, and a product sample. Approved manufacturers will only be set forth in a written and issued addendum.
4. No substitutions will be permitted after the bid date.
5. Factory Technical Representative: Roofing Contractor is to arrange and schedule the manufacturer's technical representative to be on site the first day of the installation of manufacturer's roofing system. The manufacturer's technical representative shall inspect the work of the contractor at least one time each week during the course of the installation of the Standing Seam metal roofing system. The manufacturer's technical representative shall perform with the owner's representative and the roofing contractor a final inspection of the roofing system. At the completion of the final inspection, provide to the roofing contractor a list of punch list items (if any) to be correct before technical acceptance of the roofing project and prior to issuance of manufacturer's Twenty (20) Year Full System Warranty. Field reports shall be provided after each inspection within five (5) days of site visit.

B. Applicator Qualifications:
1. Panel Applicator must have a minimum of five (5) years experience in the application of standing seam metal roof systems.
2. Panel Applicator must be factory trained by the standing seam metal roof system manufacturer prior to the bid date in order to obtain a contract for installation.
3. Use adequate members of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this Section.
4. Use equipment of adequate size, capacity and numbers to accomplish the work of this Section in a timely manner.
5. Upon request, submit a minimum of five (5) successfully completed projects of similar size and scope. List project address, date of installation, Architect and Owner's name and telephone numbers.
6. Single Source Responsibility: Provide all items of the standing seam metal roof system work specified herein by a single roofing contractor to provide undivided responsibility.

C. Regulatory Requirements: Comply with all requirements of applicable building codes and other agencies having jurisdiction for positive and negative design loads of standing seam metal roof systems.

1.06 DELIVERY, STORAGE AND HANDLING

A. Delivery:

1. Delivery of material shall be made only after suitable facilities for its storage and protection area available on the site.
2. Protect products and accessories from damage and discoloration during transit and at project site.
3. Upon receipt of prefinished preformed metal panels, flat sheets, flashings and panel accessories, Panel Applicator shall examine each container for damage and for completeness of the consignment.

B. Storage:
1. Store materials out of the weather in a clean, dry place. One end of each container should be slightly elevated and covered with a loose weatherproof covering to prevent condensation.
2. Panels and/or flashings with strippable film must not be stored in areas exposed to direct sunlight.
3. Care should be taken to prevent contact with any substance that may cause discoloration.
4. Store materials to provide ventilation and prevent bending, abrasion or twisting.
5. Do not overload roof structure with stored materials. Do not permit material storage or traffic on completed roof surfaces.

C. Handling:
1. Care should be taken to avoid gouging, scratching or denting.
2. Do not allow traffic on completed roof. If required, provide cushioned walk boards.
3. Protect installed products from damage caused by foreign objects and construction until completion of project.
4. Comply with pertinent provisions of Supplementary General Conditions.

1.07 WARRANTY

A. Furnish manufacturer's standard twenty (20) year, non-prorated labor and material written finish warranty stating that architectural fluorocarbon finish will be:
1. Free from fading or color change in excess of five (5) NBS units as measured per ASTM 2244-68.
2. Will not chalk in excess of a numerical rating of seven (7) when measured in accordance with standard procedures specified in ASTM D 659-74.
3. Will not peel, crack, chip or delaminate.

B. Furnish a written warranty signed by the Panel Applicator for a two (2) year period from the date of substantial completion of the building guaranteeing materials and workmanship for weathertightness of the roofing system, flashings, penetrations and against all leaks.

C. Special Weathertight Warranty: Furnish manufacturer's twenty (20) year, full system, non-prorated, no dollar limit weathertight warranty to be jointly signed by the manufacturer and the Panel Applicator.

D. Protect products and accessories from damage and discoloration during transit and at project site. Store sheets and components in dry storage area to prevent condensation.

E. Do not overload roof structure with stored materials. Do not permit material storage or traffic on completed roof surfaces.

1.08 PRE-INSTALLATION CONFERENCE

A. Convene prior to commencing work of this Section.

B. Attendants: Panel Applicator, installer of each component of associated work, installers of deck or substrate construction to receive roofing work, Architect, Owner or Owner's Representative, Roofing system manufacturer's technical representative and General Contractor.

C. Record discussion, decisions and agreements reached and furnish a copy to each attendant.

D. Review installation procedures and coordination required with related Work.

E. Tour representative areas of roofing substrates, inspect and discuss condition of substrates, roof drains, curbs, penetrations, wood nailers and other preparatory work performed by other trades.

F. Review structural loading limitations of steel deck and inspect deck for loss of flatness and as required for mechanical fastening.

G. Review roofing system requirements (approved manufacturer's shop drawings, specifications and other contract documents.

H. Review required submittals.

I. Review and finalize construction schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to avoid delays.

J. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing.

K. General Contractor to document the meeting with written minutes and copy all in attendance.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Standing Seam Metal Roof System: Match existing like, kind and quality
   1. Petersen Aluminum Corporation: Tite-Loc Plus
   2. McElroy Metals
   3. Berridge
   4. Or prior approved equal

B. High Temperature Bituthane Membrane Waterproof Underlayment: A 40 mil self-adhering membrane, or prior approved equal.
   1. Tamko "TW Metal and Tile"
   2. Grace "Ice and Water Shield HT"
   3. Or Prior approved equal

C. Existing Nailbase to remain – Repair and damaged or rotten plywood as required to install the new high temp membrane

D. Substitutions:
1. Approved manufacturers will only be set forth in a written and issued addendum.
2. Alternate manufacturers must fully comply with all specified requirements.

2.02 MATERIALS:

A. Panels:
1. Prefinished Galvalume® sheet, ASTM AZ50 made of 55% aluminum, 1.6% silicon and the balance zinc as described in ASTM specification A792.
2. Panels shall be 22-gauge with a Polyvinylidene (Kynar 500) Finish.
3. Factory fabricated panel with integral continuous overlapping seams suitable for continuous locking or crimping by mechanical means during installation. Onsite or field manufactured panel profiles are not acceptable.
4. Seam Size:
   a. Male leg: 2" high, on Tite-Loc Plus
   b. Female leg: 2" high, on Tite-Loc Plus
5. Provide butyl sealant within the confines of female seam flange, on the bottom edge of female seam flange, designed to seal against adjacent male panel leg.

B. Clip/Fastener Assemblies:
1. Typical clip, UL-90 requirements:
   a. Wind Rated Fasteners: As per approved manufacturer's engineered shop drawings.
   b. Wind Rated Clip: Sliding 22-gauge galvanized steel hook in combination with a double fastened 18-gauge galvanized steel base, both at Fy (MIN) = 33 ksi. Clip hook shall have a shop installed hot-melt butyl sealant for continuity of seal at clip locations.
2. Typical Low Clip Requirements:
   a. UL-90 Fasteners: As per approved manufacturer's engineered shop drawings.
   b. Sliding 26-gauge at Fy=40ksi (MIN) galvanized steel hook in combination with a double fastened 18-gauge at Fy = 50 ksi (MIN) galvanized steel base. Clip hook shall have a shop installed hot-melt butyl sealant for continuity of seal at clip locations.
3. Standard Flashing Fasteners: Same as Wind Rated Fasteners specified above.

C. Accessories:
1 Provide manufacturer's standard accessories and other items essential to completeness of the standing seam metal roof installation.
2. Roof Jacks: Manufacturer's standard EPDM with an aluminum sealing base ring; for openings twelve inches (12") or smaller, centered in panel; do not interrupt seam.
3. Roof Curbs: fabricated to the specifications of the standing seam metal roof manufacturer, thereby assuring compatibility with the roof construction framing and covering. Roof curbs shall be of sufficient size and design to coordinate with requirements for support of heat and smoke vents specified in another Division 7 Section. Roof curb flashing and framing shall provide for the expected expansion and contraction of the standing seam metal roofing system.
4. Gutters and downspouts will be fabricated to the same gauge and specification as panel.

D. Field Sealants:
   1. Color coordinated primerless silicone, urethane, or high grade, non-curing butyl as recommended and engineered by panel manufacturer.
   2. Do not use sealants containing asphalt.

E. High Temperature Bituthane Membrane Waterproof Underlayment:
   1. 40 mil flexible, self-adhering rubberized asphalt sheet membrane with a polymeric film on the surface and a removable silicone-treated release sheet on the adhesive side
   2. Bituthane membrane underlayment shall be rated for high temperature resistance up to 260 F.
   3. Bituthane membrane shall have a maximum permeance rating of 0.05 perms.
   4. Minimum thickness shall be 40 mils.

F. Factory Fabricated Polyisocyanurate Nailbase Clad Rigid Insulation: Refer to 07 22 16 Roof Board Insulation for nail base configuration.

2.03 FABRICATION:

A. Panels:
   1. Provide factory formed panel widths of sixteen inch (16"), with a one and one-half inch (1-1/2") high standing seam.
   2. On-site or field manufactured panels are prohibited. Field curving of pre-manufactured panels is acceptable.
   3. Provide panels with no end laps (splices).
   4. Roof panels shall have flush horizontal and vertical surfaces to facilitate sealing at terminations.

B. Seams:
   1. Panel seams shall interlock entire length of seam, by means of a mechanically driven rib seamer.
   2. Design standing seam to lock up and resist joint disengaugement during design wind uplift conditions as calculated to comply with local building codes and design uplift criteria.
   3. Provide factory sealant within confines on trailing edge of female seam leg to aid in resistance of leaks and provide panel-to-panel seal while allowing expansion and contraction movement, and the seams shall be continuously locked or crimped together by mechanical means during installation.

C. Clips:
   1. Provide Wind Rated Clips designed to allow panels to thermally expand and contract and provide a minimum of ± one inch (1") of thermal movement. Clips shall incorporate a self-centering feature to allow a minimum of one-half inch (1/2") of movement in either direction for a total movement one inch (1").
   2. Clips shall be designed to meet positive and negative pressures as calculated and engineered by the standing seam metal roofing system manufacturer.
   3. Fasteners shall penetrate metal deck a minimum of three-fourths inch (3/4").

D. Engineer panels to use concealed anchors that permit expansion and contraction.

E. Trim/Flashings:

1. Prefinished sheet metal designed by the manufacturer in the same gauge, material and finish as the standing seam metal roofing system.
2. Locations, design, sealing and fastening methods as per the manufacturer's approved engineered shop drawings.

2.04 FINISH:

A. Fluorocarbon Coating:
1. Full strength 70% Kynar 500® coating baked on for fifteen (15) minutes at 450°F to dry-film thickness of 1.0 mil.
2. 15% reflective gloss (ASTM D 523). (Low Gloss).
3. 0.3 mil baked on epoxy primer.
4. Backer side of panels to be painted with an off-white polyester coating.
5. Top Side Color: As selected by Architect from manufacturer's full range of color offerings, including metallic and custom colors

PART 3 EXECUTION

3.01 CONNECTING WORK

A. General: Provide metal roofing panels of full length from eave to ridge when possible.
1. Field cutting by torch is not permitted.
2. Do not apply roofing during inclement weather.
3. Do not apply roofing to damp or frozen deck surface.
4. Do not expose materials vulnerable to water, wind or sun damage in quantities greater than can be weatherproofed during the same day.
5. Rigidly fasten point of fixity (high center) of metal roof panels and allow free eave movement due to thermal expansion and contraction per the approved shop drawings.
6. Install screws fasteners with power tools having controlled torque.
7. Locate and space fasteners per the approved shop drawings in true vertical and horizontal alignment.
8. Install all flashings per the approved shop drawings as work progresses. Position roof jacks only in the flat of the panel; do not alter standing seam ribs.

B. The Panel Applicator shall examine all surfaces on which their work is to be applied, and shall notify the Architect in writing if not suitable to receive their work. Work on any surface shall constitute acceptance of this surface by the Panel Applicator. After beginning installation, install approximately 500 square feet of panels for Architect's approval, before proceeding with substantial work.

C. Wood Members, Units: Comply with requirements of Section 06 10 00 Rough Carpentry of these specifications for nailers and other wood members indicated as roofing system work. Provide wood pressure treated with water-borne preservatives for above ground use. All nailers shall be anchored sufficiently to resist a force of 75 pounds ± per linear foot in any direction. Provide nailers at all locations required by the roofing manufacturer (whether shown or not) – verify conditions prior to commencement of roofing installation.

3.02 FIELD MEASUREMENTS

A. Panel Applicator must take field measurements to verify or supplement dimensions indicated prior to fabrication of any materials. Where field measurements cannot be made without delaying the work, either establish opening dimensions and proceed with fabricating panels without field measurements or allow for trimming panel units.

3.03 EXISTING NAILBASE

A. Reuse the existing plywood substrate. Repair any damaged or rotten plywood as needed to install the new roof system.

3.04 WATERPROOF UNDERLAYMENT INSTALLATION

A. Fully adhere one ply of high temperature 40 mil self-adhering waterproofing underlayment over entire roof surface. Stagger joints perpendicular to metal roofing panels and over parapet blocking per manufacturer's written instructions, but with not less than six inch (6") laps at vertical (side) laps and four inch (4") horizontal (top and bottom) laps.

B. Install an extra layer of minimum thirty-six inch (36") wide waterproof membrane down all valley, rake wall, eaves and gable conditions, using a minimum six inch (6") horizontal (top and bottom) lap.

3.05 METAL ROOFING INSTALLATION

A. Workmanship shall conform to standards set forth in the architectural sheet metal manual as published by SMACNA.

B. Comply with manufacturer's instructions for assembly, installation, and erection in order to achieve a weathertight installation. Install in accordance with approved shop drawings.
   1. Anchor securely in place using clips and fasteners spaced in accordance with manufacturer's recommendations for design wind load criteria.
   2. Panels should be installed in such a manner that horizontal lines are true and level and vertical lines are plumb.
   3. Field apply sealant to penetrations, transitions, and other locations as necessary for an airtight, waterproof installation.
   4. Remove all protective film, if any, before installation of materials.

C. Dissimilar Metals: Do not allow panels or flashings to come into contact with dissimilar metals.

3.06 CLEAN UP

A. Clean exposed surfaces of work promptly after completion of installation.

B. Only minor scratches and abrasions will be allowed to be touched up. Any other damaged material shall be replaced.

C. Leave work areas clean, free from grease, dirt, finger marks, stains and stains.

D. Remove scrap and debris from surrounding grounds and work areas daily.

3.07 PROTECTION

A. Metal Roofing: Protect work as required to ensure that the standing seam metal roof system will be without damage at time of final completion.

B. Clean all new surfaces in accordance with the manufacturer's recommendations.

END OF SECTION 07 61 13

SECTION 07 62 00
SHEET METAL AND MISCELLANEOUS ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Provide flashing and sheet metal components for moisture protection.
2. Related accessories.

1.02 DEFINITIONS

ACM	Asbestos Containing Materials
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
CTEM	Coal-Tar Elastomeric Membrane
EIP	Ethylene Interpolymer
EPA	Environmental Protection Agency
EPDM	Ethylene Propylene Diene Monomer
EPS	Expanded Polystyrene
EVT	Equiviscous Temperatures
FM	Factory Mutual
IBC	International Building Code
KEE	Ketone Ethylene Ester
NDL	No Dollar Limit
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NRCA	National Roofing Contractors Association
OSHA	Occupational Safety & Health Administration
SBS	Styrene-Butadiene-Styrene
SDI	Steel Deck Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
UL	Underwriters Laboratories, Inc.

1.03 SUBMITTALS

A. Product Data:
1. Submit shop drawings, product data and mockups of all sheet metal.

1.04 QUALITY ASSURANCE

A. Comply with governing local, state, and federal regulations, safety standards, and codes. Provide products of acceptable manufacturers in satisfactory use in similar service for five (5) years. Use experienced installers. Deliver, handle and store materials in accordance with manufacturer's instructions.

B. Reference Standards: Applicable portions of ASCE, SMACNA, ASTM, and NAAMM publications.

1.05 WARRANTIES

A. Manufacturer's Product Warranty: Submit manufacturer's ten (10) year labor and material warranty signed by the manufacturer's authorized official, guaranteeing to correct failures in product which may occur during the warranty period, without reducing or otherwise limiting any other rights to correction which the Owner/Project Consultant may have under the contract documents. Failure is defined to include product failure which leads to interruption of a watertight installation. Correction may include repair or replacement of failed product.

B. Contractor's Warranty Period: For roofing flashing and sheet metal, provide a written warranty which shall warrant work to be free of leaks and defects in materials and workmanship for two (2) years, starting from date of substantial completion.

C. Defects of the sheet metal occurring during the warranty period shall be promptly corrected by the contractor, and defects of the roofing shall be promptly corrected by the manufacturer at no additional cost to the Owner. Upon notification from the Owner or the Owner's representative that evidence of a defect exists, the responsible party shall immediately inform the Owner's representative of the date on which corrective work will be scheduled, and shall notify the Owner's representative when the corrective work has been completed.

PART 2 - PRODUCTS

2.01 SHEET METAL MATERIAL

A. Hot-dipped Galvanized Steel for use as counterflashings (where not visible from the ground), and expansion joints: Minimum 24-gauge, G-90, hot-dipped galvanized metal, commercial quality, ASTM A 653/A 653M.

B. Stainless Steel for use as pitch pans: Minimum 24-gauge, commercial quality, ASTM A 653/A 653M.

C. Hot-dipped Galvanized Steel for use as continuous clips: Minimum 22-gauge, G-90, hot-dipped galvanized metal, commercial quality, ASTM A 653/A 653M.

D. Prefinished Galvanized Sheet Steel (where visible from the ground): Shall be 24-gauge flat stock, prefinished with Kynar finish meeting ASTM A 446, forty-five and one-half inches to forty-eight inches width by one hundred twenty inches in length (45-1/2" - 48" x 120") for use as new metal edge gravel guard, cover plates, downspouts, gutters, coping and miscellaneous metal.

E. Stainless Steel: QQ-S-766, Class 304 or 316; or ASTM A 167, Type 304 or 316; form and condition most suitable for the purpose.

F. Prefinished Aluminum: Shall be that most suitable for the purpose.

G. All existing sheet metal shall be replaced with new metal of like gauge and type, or as specified on drawings.

H. All prefinished metal color shall be as selected by Owner/Architect from manufacturer's full range of colors, including metallics.

2.02 FASTENERS

A. Fasteners shall be same metal as flashing/sheet metal, or other non-corrosive metal as recommended by sheet manufacturer for the specific application. Match finish of exposed heads with material being fastened.

B. Fasteners and fastening plates or bars shall be listed in the FM Global Approval Guide.

C. Fastener for Brick: Shall be one-fourth inch by two inches (1/4" x 2"), zinc with plated steel or stainless steel nail, one piece unit, flat head.

D. Screws: Self-taping sheet metal type with neoprene washer, as appropriate.

E. Pop Rivets: Full stainless steel Series 42 or 44, as appropriate.

F. Continuous Clip: Concealed hold-down clip type; of same materials as coping, gravel guard, sized to suit application. Use a continuous clip, minimum 22-gauge G-90 galvanized.

2.03 RELATED MATERIAL

A. Plastic Cement: FS SS-C-153, cutback asphalt type.

B. Solder: For use with galvanized steel or copper, provide 50-50 tin/lead solder (ASTM B 32), with rosin flux.

C. Copper, Sheet, and Strip: QQ-C-576, ASTM B 370, light cold-rolled temper, minimum 16 ounce.

D. Sealant (for Sheet Metal): One-component polyurethane, conforming to requirements of FS TT-S-230C, non-staining and non-bleeding.

E. Miscellaneous Materials:
   1. Downspout Boots: Provide and install cast iron by Neenah Foundry Company, or pre-approved equal.
   2. Splash Blocks: Concrete, 3000 psi, 28 days. Provide and install with protection pads at all downspouts. Dimensions shall be a minimum eighteen inches wide by thirty-six inches long (18" x 36").
   3. Metal Accessories: Provide and install sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size, and gauge required for performance.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify roof openings, curbs, pipes, sleeves, ducts or vents through roof are solidly set, cant strips and reglets in place, substrates are smooth and clean and nailing strips located.

B. Verify membrane termination and base flashings are in place, sealed and secure, prior to metal installation.

C. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Field measure site conditions prior to fabricating work. Provide all shop drawings and mock-ups one month prior to installation to the Owner/Project Consultant for approval.

B. Install starter and edge strips and cleats before starting installation.

3.03 FABRICATION - GENERAL

A. Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer’s instructions and recommendations. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems.

B. Fabricate gravel stops/fascia, gutters/downspouts, counterflashings, expansion joints, and copings with new galvanized sheet metal as specified. Fabricate gravel guard and fascia to size and dimensions as indicated on the drawings. Fabricate light metal coping, gutters and downspouts as indicated.

C. Fabricate pitch pans with new stainless steel as specified.

D. Form sheet metal on bending brake.

E. Form materials with straight lines, sharp angles and smooth curves.

F. Fold back edges on concealed side of exposed edge to form hem (1/4" minimum).

G. Weld or solder joints on parts that are to be permanently and rigidly assembled.

H. Limit single-piece lengths to ten feet (10’).

I. Fabricate corner pieces with eighteen inch (18") extensions, mitered and sealed by forming as one piece.

J. Where installing flashing directly to masonry or dissimilar materials, backpaint with bituminous paint.

K. Install new metal rooftop projections. New rooftop projection details shall be as recommended in NRCA or SMACNA handbooks. All rooftop projections shall be cleaned, all joints sealed, and painted with a rust inhibitive paint.

L. All sheet metal shall be sealed and watertight.

M. Metal work should be secured so as to prevent damage from buckling or wind. Where clips are shown, fabricate as detailed.

N. All metal to receive bitumen or adhesive shall be first primed with asphalt primer.

O. All prefinished metal shall be sanded and/or abraded prior to receiving primer.

P. Separations: Provide for separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

Q. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.

3.04 INSTALLATION

A. General: All sheet metal termination to vertical wall shall have a through-wall with receiver installed on masonry walls or prefabricated "Z" bar flashing pre-installed to fluid applied wall finished prior to installation of sheet metal termination. This applies to edge metal, base flashing closures and all vertical surface intersections. Refer to NRCA, SMACNA, and metal manufacturer’s guidelines.

B. Gravel Guard/Fascia:
1. Shall be installed with expansion joints, ten feet (10’) on center, one-fourth inch (1/4") expansion leeway, with a cover plate.
2. Form sections identical to profiles as shown or approved similar, to match existing building.
3. Fabricate corner pieces with minimum eighteen inch (18"), maximum forty-eight inch (48") extensions, formed and sealed with rivets and sealant, as one piece.
4. Hem exposed edges one-half inch (1/2") minimum.
5. Backpaint flashing in contact with masonry or dissimilar materials with bituminous paint. Surface sand before applying primers.
6. Integrate flashing in a manner consistent with detailing.
7. Provide and install continuous clip, minimum 22 gauge.
8. Apply sealant at horizontal juncture of gravel guard metal to exterior vertical wall.
9. Shall be fabricated in accordance with published details.
10. Install bead of sealant at metal edge juncture at exterior wall surface.

C. Coping:
1. Install new pre-manufactured metal coping for a permanent watertight installation.
2. All coping shall be pre-manufactured to include low profile standing metal seam to meet ANSI/SPRI ES-1 requirements.
3. Shall be minimum 24-gauge prefinished Kynar installed in ten foot (10’) sections maximum.

4. Vertical fascia shall extend minimum two and one-half inches (2-1/2") or be minimum one and one-half inches (1-1/2") below bottom of nailer, whichever is greater.
5. Fabricate corner pieces with minimum eighteen inch (18"), maximum forty-eight inch (48") extensions, formed and sealed with rivets and sealant, as one piece.
6. Hem exposed edges one-fourth inch (1/4") minimum.
7. Provide and install continuous clip, minimum 22-gauge.
8. Shall be fabricated in accordance with published details.

D. Expansion Joint Field and at Wall:
1. Shall be as outlined by details, and be in full compliance with these specifications.
2. Lock seams and end joints.
3. Fabricate corner pieces with minimum eighteen inch (18"), maximum forty-eight inch (48") extensions, formed and sealed with rivets and sealant, as one piece.
4. Hem exposed edges one-fourth inch (1/4") minimum.
5. Backpaint flashing in contact with masonry or dissimilar materials with bituminous paint. Surface sand before applying primers.
6. Integrate flashing in a manner consistent with detailing.
7. Provide and install continuous clip, minimum 22-gauge or one gauge thicker than flashing.
8. Shall be fabricated in accordance with published details.

E. Counterflashing:
1. Provide and install new two-piece sheet metal counterflashing as required for a permanent watertight installation.
2. Saw cut brick mortar joint to receive friction fit reglet and removable counterflashing as detailed in SMACNA 7th Edition Figure 4-4D.

F. Gutter and Downspout:
1. Fabrication:
   a) Fabricate gutter and downspout of profile and size to match existing and as indicated on drawings.
2. Refer to Gutter and Downspouts Specification Section 07 62 13 for further information.

G. Overflow Scupper, Collector Head and Downspout:
1. Fabrication:
   a) Fabricate overflow scupper, collector head and downspout of profile and size indicated, taking care that the roof drain leader fits properly into the back of the collector head. Seal the pipe to the collector head for watertightness.
   b) Field measure site conditions prior to fabricating work.
   c) Fabricate with required connection pieces.
   d) Fabricate section square, true, and accurate in size, in maximum possible lengths and free of distortion or defects detrimental to appearance or performance.
   e) Hem exposed edges of metal.
   f) Form and seal all metal joints; provide for expansion joints per SMACNA.
2. Installation:
   a) Install collector head, downspout, and accessories.
   b) Join lengths with seams pop riveted and sealed watertight. Flash and seal collector head to downspouts and accessories.
   c) Seal all metal joints watertight for full metal surface contact.

d) Collector Head: SMACNA style profile; submit detail for approval.
e) Downspouts: Rectangular profile. Seal all joints, six inches by six inches (6" x 6") minimum or as shown on published details.
f) Support Brackets, Joint Fasteners: Profiled to suit gutters and downspouts.
g) Anchorage Devices: SMACNA requirements. Type recommended by fabricator.
h) Collector Head Supports – Kynar.
i) Downspout Support Straps – Kynar.

H. Pitch Pans – Stainless Steel:
1. Install pitch pans of 24-gauge stainless steel according to NRCA standards, minimum of six inches by six inches (6" x 6").
2. Pitch pans shall be fabricated to minimum of four inches (4") above the finished roof membrane. Seams of pitch pans shall be soldered inside and out.
3. Mastic shall be applied under pitch pan flange a minimum of one-half pound (1/2#) per linear foot.
4. All metal flanges shall be primed with asphalt primer prior to flashing installation. Inside of pitch pan shall be cleaned and primed.
5. All projections enclosed in pitch pans shall be cleaned in any manner suitable and coated with a rust inhibitive coating as approved by the Owner/Project Consultant. Coating shall be allowed to dry prior to pitch pan fill.
6. Base of pitch pans shall be filled around penetration with M-1 sealant. Sprinkle mod bit granules over sealant 1/4" deep.
7. Top finish fill shall be coal-tar urethane, with maximum fill to within three-eighths inch (3/8") of top of pitch pan sides.
8. Strip metal flange of pitch pan with one strip of Type IV fiberglass felt set in hot bitumen extending from the outer edge of the flange a minimum of three inches (3") inward to base of pitch pan.
9. Strip in fiberglass felt with 60 mil coal-tar elastomeric membrane (CTEM) flashing set in hot asphalt extending from the outer edge of the Type IV fiberglass underlayment a minimum of three inches (3") inward to the base of the pitch pan.

I. Bonnets/Hoods:
1. Fabricate and install above all pitch pans, where necessary, or reinstall as applicable, metal bonnets over all pitch pans, NO EXCEPTIONS.
2. Bonnets/Hoods shall be manufactured with metal compatible with metal to which bonnet is to be attached.
3. On beams and other steel, weld in place bonnets fabricated from one-fourth inch (1/4") steel plate.
4. Draw band bonnets fabricated from 22-gauge galvanized steel may be used on circular projections.

3.05 FINISH

A. Backpaint concealed metal surfaces with bituminous paint where expected to be in contact with cementitious materials or dissimilar metals. Exposed surfaces to be provided with a factory applied fluorocarbon Kynar finish meeting ASTM A 446 and AAMA specification 605.2 for high performance coating.

B. New 24-gauge hot-dipped galvanized metal shall be painted on all locations visible from the ground with an industrial grade paint as selected by Project Manager/Architect from manufacturer's full range of colors, including metallics. Galvanized metal surface must be properly prepared by removing all oil, grease, and/or protective mill coatings by solvent cleaning surface in accordance with SSPC-SP1, and according to paint manufacturer's recommendation, to ensure proper adhesion of paint to metal.

END OF SECTION 07 62 00

SECTION 07 62 13
GUTTERS AND DOWNSPOUTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Precoated galvanized steel gutters, downspouts, scuppers, brackets, spacers, fasteners, stiffeners and caps.
2. Precast concrete splash blocks.

1.02 REFERENCES

A. American Society for Testing and Materials:
1. ASTM A 48 – Grey Iron Castings.
2. ASTM A 167 – Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
3. ASTM A 361 – Sheet Steel, Zinc-Coated (Galvanized) by Hot-Dip Process for Roofing and Siding.
4. ASTM A 446 – Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
5. ASTM B 32 – Solder Metal.
6. ASTM B 209 – Aluminum and Aluminum Alloy Sheet and Plate.

B. Federal Specifications: FS TT-C-494 – Coating Compound, Bituminous, Solvent Type, Acid Resistant.

C. SMACNA – Architectural Sheet Metal Manual.

1.03 SUBMITTALS

A. Product Data: Provide technical data, installation instructions, and general recommendations for each specified sheet material and fabricated product.

B. Shop Drawings: Showing layout, profiles, jointing methods, fastening details, locations, and installation details.

C. Samples: Submit six inch (6") long samples of factory-fabricated products illustrating component design, finish, color and configuration.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Five years documented experience installing sheet metal systems.

B. Regulatory Requirements: Comply with applicable code for size and method or rain water discharge. Comply with SMACNA Manual for sizing components for rainfall intensity determined by storm occurrence of 1 in 5 years.

C. Gutters/Downspouts and all accessories shall be designed and provided by metal roofing manufacturer providing the standing seam metal roof panels.

1.05 DELIVERY, STORAGE AND HANDLING

A. Stack preformed and prefinished material to prevent twisting, bending or abrasion, and to provide ventilation. Slope to drain.

B. Prevent contact with materials during storage which may cause discoloration, staining or damage.

1.06 SEQUENCING AND SCHEDULING

A. Coordinate work with roofing work for correct sequencing of items which makes up entire weatherproof, rain drainage and sheet metal system.

B. Coordinate work with downspout discharge pipe inlet.

C. Coordinate gutter and downspout system with installation of field fabricated flashing and sheet metal and sheet metal roofing under Section 07 62 00. Work of this Section shall bring gutters and downspouts to point of connection with roofing system, with necessary accommodations for connections.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Pre-Coated Galvanized Steel: ASTM A 446, Grade A, G 90 zinc coating, 24-gauge core steel, shop pre-coated.

B. Fasteners: Galvanized steel screws, bolts or nuts, as applicable.

C. Stiffener Angles and Supports: Formed steel, type to match gutters, 18-gauge and clad with prefinished metal cover.

D. Solder: ASTM B 32, 50-50 percent tin/lead solder with rosin flux for use with steel.

E. Neutralized: Five percent (5%) to ten percent (10%) washing soda solution.

F. Protective Back Paint for Galvanizing: Zinc chromate or galvanized iron type.

G. Bituminous Coating: FS TT-G-494, or MIL-C-18480, or SSPC-12, cold-applied bituminous mastic, compound, for 15 mil dry film thickness coating.

H. Wire Screen: One-half inch (1/2") mesh, stainless steel.

I. Splash Pads or Blocks: Precast concrete type; minimum 3000 psi at 28 days, with minimum five percent (5%) air entrainment.

2.02 FABRICATION

A. Gutters: SMACNA style profile as detail by Architect; same gauge as panel.

B. Downspouts: SMACNA profile as detailed by Architect; same gauge as panel.

C. Fabricate gutters and downspouts true to design and dimensions, straight and without deformation. Finish work free from blemishes, abrasions, tool marks, burrs and other defects which may affect strength or performance. Form corners to smallest radius possible without causing grain separation or otherwise impairing work. Allow for expansion and contraction.

D. Completely weld joints in gutter sections to provide watertight units. Form expansion joints between gutter sections as shown. Weld stiffener angles to gutters 4’-0" on center.

E. Weld angles to underside of gutters at downspout locations to form frame, weld downspout tube to angles.

F. Form gutters in eight foot (8’) or ten foot (10’) long welded sections, lap joints one and one-half inch (1-1/2"). Provide loose-locked expansion joints midway between outlet tubes and where gutter ends adjoin walls. Fit joints with cover strips in manner to provide watertight connections.

G. Provide outlet tubes with flanges riveted and soldered to form gutters. Extend tubes three inches (3") into downspouts. Set gutters to slope to downspouts minimum one-eighth inch (1/8") for each foot.

H. Form downspouts in eight foot to ten foot (8’ - 10’) lengths. Telescope end joints one and one-half inch (1-1/2") and lock longitudinal joints. Fasten downspouts to walls with three inch (3") wide straps. Space straps not more than eight feet (8’) apart. Provide shoulder of solder on each side of downspout above each strap. Fasten straps to walls with screws in lead sleeves. Form downspouts of length to discharge water three feet to zero inches (3’ – 0") from building slab.

I. Lock and solder, or weld without flux all seams. Close tops of downspout heads with 18-gauge removable strainer type with wire screen.

2.03 FINISHES

A. Gutter and Downspouts: 70-75 percent fluorocarbon resin equivalent to Kynar 500/Hylar 5000; Color to selected from Manufacturers full range of colors including metallic and premium colors.

B. Back paint concealed metal surfaces with protective backing paint to minimum dry thickness of 15 mils.

C. Apply bitumen protective backing paint on surfaces in contact with dissimilar materials.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install gutters, downspouts and accessories in accordance with SMACNA Architectural Sheet Metal Manual.

B. Joint lengths with seams watertight. Flash and seal gutters to downspouts and accessories.

C. Slope gutters to drain.

D. Set splash blocks under downspouts.

3.02 FIELD QUALITY CONTROL

A. Flood test gutters and downspouts upon completion. Repair any leaks.

END OF SECTION 07 62 13

SECTION 07 72 00
ROOF ACCESSORIES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Equipment supports
2. Wall Mounted Access Ladders
3. Roof Penetration Housing
4. Cast Iron Replacement Roof Dome for Roof Drains

1.03 SUBMITTALS

A. Product Data: For each type of roof accessory indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Show fabrication and installation details for roof accessories. Show layouts of roof accessories including plans and elevations. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other work.

C. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
1. Size and location of roof accessories specified in this Section.
2. Method of attaching roof accessories to roof or building structure.
3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.

D. Samples: For each type of exposed factory-applied finish required and for each type of roof accessory indicated, prepared on Samples of size to adequately show color.

E. Warranty: Special warranty specified in this Section.

1.04 QUALITY ASSURANCE

A. Sheet Metal Standard: Comply with SMACNA’s "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Pack, handle, and ship roof accessories properly labeled in heavy-duty packaging to prevent damage.

1.06 PROJECT CONDITIONS

A. Field Measurements: Verify required openings for each type of roof accessory by field measurements before fabrication and indicate measurements on Shop Drawings.

1.07 COORDINATION

A. Coordinate layout and installation of roof accessories with (**roofing membrane and base flashing and**) interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
   1. With Architect's approval, adjust location of roof accessories that would interrupt (**roof drainage routes**) (**roof expansion joints**).

1.08 WARRANTY

A. The product manufacturer shall provide a one-year full system material warranty necessary to cover replacement of all components of the system against defects in manufacturing. The warranty will not include Acts of God, vandalism, neglect, metal finish or improper spacing of equipment, which would be a result of improper application.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers listed in other Part 2 articles.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers listed in other Part 2 articles.

2.02 METAL MATERIALS

A. Galvanized Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coated.

B. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, AZ50 (AZM150) coated.

C. Prepainted, Metallic-Coated Steel Sheet: Steel sheet metallic coated by hot-dip process and prepainted by coil-coating process to comply with ASTM A 755/A 755M.
   1. Galvanized Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coated.
   2. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZ50 (Class AZM150) coated.
   3. Exposed Finishes: High-Performance Organic Finish (2-Coat Fluoropolymer): Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's written instructions.

a) Fluoropolymer 2-Coat System: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with physical properties and coating performance requirements in (**AAMA 2604**) (**AAMA 2605**), except as modified below:
(1) Humidity Resistance: 1000 hours.
(2) Salt-Spray Resistance: 1000 hours.

D. Aluminum Sheet: **ASTM B 209**, alloy and temper recommended by manufacturer for type of use and mill finish.
1. Color: **AS Selected by Owner**
2. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: Cleaned with inhibited chemicals; Chemical Finish: Acid-chromate-fluoride-phosphate conversion coating; Organic Coating: As specified below). Apply baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating, and painting.
a) Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603 except with a minimum dry film thickness of **1.5 mils,** medium gloss.
b) Color and Gloss: As selected by Project Manager from manufacturer's full range.
3. High-Performance Organic Finish (2-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: Cleaned with inhibited chemicals; Chemical Finish: Conversion coating; Organic Coating: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2604 and with coating and resin manufacturer's written instructions.
a) Color and Gloss: As selected by Project Manager from manufacturer's full range.
4. Powder-Coat Finish: Immediately after cleaning and pretreating, electrostatically apply manufacturer's standard baked-polymer thermosetting powder finish. Comply with resin manufacturer's written instructions for application, baking, and minimum dry film thickness.
a) Color and Gloss: As selected by Project Manager from manufacturer's full range.

E. Aluminum Extrusions and Tubes: ASTM B 221 (ASTM B 221M), alloy and temper recommended by manufacturer for type of use, mill finished.

F. Stainless-Steel Shapes or Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304 or Type 316, No. 2D finish.

G. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized to comply with ASTM A 123/A 123M, unless otherwise indicated.

H. Steel Tube: ASTM A 500, round tube, baked-enamel finished.

I. Galvanized Steel Tube: ASTM A 500, round tube, hot-dip galvanized to comply with ASTM A 123/A 123M.

J. Galvanized Steel Pipe: ASTM A 53/A 53M.

2.03 MISCELLANEOUS MATERIALS

A. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, complying with AWPA C2; not less than one and one-half inches (1-1/2") thick.

B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

C. Polyethylene Sheet: 6-mil thick, polyethylene sheet complying with ASTM D 4397.

D. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
1. Slip Sheet: Rosin-sized paper, minimum 3 pounds per 100 square feet.

E. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by roof accessory manufacturer. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners.

F. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, or PVC; or flat design of foam rubber, sponge neoprene, or cork.

G. Elastomeric Sealant: ASTM C 920, polyurethane sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

H. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, and heavy bodied for hooked-type expansion joints with limited movement.

I. Roofing Cement: ASTM D 4586, nonasbestos, fibrated asphalt cement designed for trowel application or other adhesive compatible with roofing system.

2.04 ROOF CURBS

A. Roof Curbs: Provide metal roof curbs, internally reinforced and capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported on roof curbs. Fabricate with welded or sealed mechanical corner joints and integral formed mounting flange at perimeter bottom. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.
1. Manufacturers:
   a) ThyCurb; Div. of Thybar Corporation.
   b) Uni-Curb, Inc.
   c) Vent Products Company, Inc.
2. Load Requirements: Insert load requirements.
3. Material: Galvanized steel sheet, 0.052 inch thick.
4. Material: Aluminum sheet, 0.090 inch thick.
5. Material: Stainless-steel sheet, 0.078 inch thick.
   a) Finish: Prime painted.
   b) Finish: Mill.
6. Liner: Same material as curb, of manufacturer's standard thickness and finish.
7. Factory install wood nailers at tops of curbs.

8. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
9. Factory insulate curbs with one and one-half inch (1-1/2") glass fiberboard insulation.
10. Curb height may be determined by adding thickness of roof insulation and minimum base flashing height recommended by roofing membrane manufacturer. Fabricate units to minimum height of fourteen inches (14"), unless otherwise indicated.
11. Sloping Roofs: Where slope of roof deck exceeds 1:48, fabricate curb units with water diverter or cricket and with height tapered to match slope to level tops of units.

2.05 EQUIPMENT SUPPORTS

A. To support HVAC Duct use Model # SS2000D Duct Support. SS2000D is two 17" circular bases with 12 ga. framing channel formed to make an “H” shaped support. Framing channel is adjustable in both height and width.
   1. Manufacturers:
      a). Advanced Support Products, Inc.

B. To support heavier HVAC equipment, use equipment platform Model # HV0505B Base Platform designed by manufacturer to support the weight of the equipment and load requirements. Equipment platform shall consist of (a) 17" circular bases supporting a structural steel frame OR (b) galvanized steel plates, with four holes for approved anchoring per engineering data, supporting a structural steel frame.
   1. Manufacturers:
      a). Advanced Support Products, Inc.

2.06 WALL MOUNTED ACCESS LADDERS

A. Height of Ladder to be field verified at existing rise wall locations.

B. Provide an aluminum tread/step over the top of the parapet /roof edge so as not to step on coping or roof edge.

C. Provide walk pad at the accessible points of the ladder

D. Fixed and Cage Ladder Design, as manufactured by O’Keefe’s, Inc., Bilco, or approved equal. The basis of design is O’Keefe’s.
   1. Safety cages are required on ladders over 24 feet.
   2. Safety cages are required on all ladders in high or hazardous areas.
   3. Rail and harness fall arrest system as alternate to safety cage and landing platforms shall be a permissible manufacturer’s option.
      a) Fixed Ladder Bottom Bracket:
      b) Bottom floor supported bracket.
      c) Bottom wall supported bracket.
      d) Bracket as drawn.

E. Fixed Access Ladder
   1. Tubular Rail Low Parapet Access Ladder with Platform and Return.
      a) Model 503, as manufactured by O’Keeffe’s Inc.

F. Materials

1. Aluminum Sheet: Alloy 5005-H34 to comply with ASTM B209.
2. Aluminum Extrusions: Alloy 6063-T6 to comply with ASTM B221.

G. Finishes
1. Mill finish. As extruded.
2. Clear Anodic Finish: AA-M10C22A41 Mechanical finish as fabricated. Architectural Class I, clear coating 0.018 mm or thicker.
3. Furnish touchup kit for each type and color of paint finish provided.

H. Fabrication
1. Rungs: Not less than 1-1/4 inches in section and 18–3/8 inches long, formed from tubular aluminum extrusions. Squared and deeply serrated on all sides.
   a) Rungs shall withstand a 1,500 pound load without deformation or failure.
2. Channel Side Rails: Not less than 1/8 inch wall thickness by 3 inches wide.
3. Heavy Duty Tubular Side Rails: Assembled from two interlocking aluminum extrusions no less than 1/8 inch wall thickness by 3 inches wide. Construction shall be self-locking stainless steel fasteners, full penetration TIG welds and clean, smooth and burr-free surfaces.
4. Walk-Through Rail and Roof Rail Extension: Not less than 3 feet 6 inches above the landing and shall be fitted with deeply serrated, square, tubular grab rails.
5. Landing Platform: 1-1/2 inches or greater diameter, tubular aluminum guardrails and decks of serrated aluminum treads.
6. Ladder Safety Post: Retractable hand hold and tie off.
7. Rail and Harness Fall Arrest System: Supplied where specified as alternate to safety cage and landing platforms, in accordance with OSHA regulation 1910.27; permanently mounted to ladder rungs and complete with necessary components.
8. Safety Cages WHERE REQUIRED
   a) Fabricate ladder safety cages to comply with authority having jurisdiction. Assemble by welding. Spacing of primary hoops, secondary hoops and vertical bars shall not exceed that required by code.
   b) Safety cage hoops and vertical bars: 3/16 inch by 2 inches aluminum bar.

2.07 ROOF PIPE SUPPORTS

A. To support conduit or pipe sized up to Ø8" when height adjustment is needed use Model # SS1000A Adjustable Pipe Support. 17" circular base with 12 ga. framing channel, 18"L, attached to 17" circular base using 1/2" threaded rods, 12"L, with washers and nuts. Height of channel can be adjusted along the length of the 1/2" threaded rods. Strut clamps are suggested to hold piping or conduit in place.
1. Manufacturers:
   a) Advanced Support Products, Inc.

B. To support water or gas piping up to Ø8" or when a roller support with height adjustment is needed use Model # SS1000RA Pipe Support with Adjustable Roller. 17" circular base with SBR heavy duty rubber roller assembly attached to 17" circular base using 1/2" threaded rods, 12"L, with washers and nuts. Height of roller assembly can be adjusted along the length of the 1/2" threaded rods.
1. Manufacturers:
   a) Advanced Support Products, Inc.

C. To support multiple pipe runs, piping up to Ø12" when height adjustment or pipe suspension is needed use Model # SS4000P, SS6000P or SS8000P Adjustable Support Bridge. SS4000P Adjustable Support Bridge is made of four (4) 17" circular bases and 12ga. framing channel formed to make one “H” shaped support with crossbar. SS6000P Adjustable Support Bridge is made of six (6) 17" circular bases and 12ga. framing channel formed to make two “H” shaped supports with crossbar. SS8000P Adjustable Support Bridge is made of eight (8) 17" circular bases and 12ga. framing channel formed to make three “H” shaped supports with crossbar. Crossbar height is adjustable and offered in 18", 24", 36", and 48" lengths. Use Adjustable Support Bridge with strut clamps or roller accessories or use optional hanger supports to suspend water or gas piping at various heights. Optional hanger supports attached to support frame using 1/2" threaded rods. Hangers offer complete height adjustments along the length of 1/2" threaded rods.
   1. Manufacturers:
      a) Advanced Support Products, Inc.

2.08 PREFORMED FLASHINGS

A. Exhaust Vent Flashings: Double-wall metal flashing sleeve, urethane insulation filled, with integral deck flange, fourteen inches (14") high, with removable metal hood and (**perforated**) metal collar, and as follows:
   1. Manufacturers:
      a) Thaler Metal Industries Ltd., or approved equal.
   2. Metal: Aluminum sheet, 0.064 inch, mill finished.
   3. Diameter: Four inches (4").

B. Vent Stack Flashing: Metal flashing sleeve, with integral deck flange, uninsulated, and as follows:
   1. Manufacturers:
      a) Thaler Metal Industries Ltd., or approved equal.
   2. Metal: Aluminum sheet, 0.064 inch thick, mill finished.
   3. Height: Eight inches (8").
   4. Diameter: As indicated.

2.09 ROOF PENETRATION HOUSINGS

A. Product: The Vault® by Roof Penetration Housings

B. Construction:
   1. 0.080 inch (2mm) thick aluminum housing and curb
   2. UV protected powder coated finish (2 mil (.05 mm) thick)
   3. Stainless Steel. V.P. fasteners
   4. Gasketed lid to housing and housing to curb connection joints to ensure compliance to ICC 2015 Air Permeance Levels
   5. Standard Color: Bright White to meet an initial SRI of 88.2 (Old models - Beige for SRI 85)
   6. Seismic Available upon request. Seismic calculations, conditions to be furnished to RPH by engineer
   7. Constructed to withstand wind to 225+ MPH, third party tested.

C. Style & Sizes:
   1. Series AWI – Pre-Insulated curb, 6” Thick, R-40 Factor, to

meet ICC – 2015 Energy Code. (The AWI model allows the A/E to comply with new Building Envelope Requirements to ensure that the complete envelope is insulated to Energy Code Regulations for every area in the country with one insulated curb.)

a) Small Vault®
Model: **AWI-161010**
L – 16 ½" W – 9 ¾" H – 10"

b) Medium Vault®
Model: **AWI-201412**
L – 20 ½" W – 14 ½" H – 12"

c) Mega Vault®
Model: **AWI-343424**
L – 34" W – 34" H – 24"

2.10 CAST IRON REPLACEMENT ROOF DOME

A. Product: Cast Iron Roofguard – cast iron replacement roof dome with a 19" diameter, horizontal slotted, free area drainage design.
1. Manufacturer: MIFAB
a) Model RG2016DDC

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of work.
1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored and is ready to receive roof accessories.
2. Verify dimensions of roof openings for roof accessories.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General: Install roof accessories according to manufacturer's written instructions. Anchor roof accessories securely in place and capable of resisting forces specified. Use fasteners, separators, sealants, and other miscellaneous items as required for completing roof accessory installation. Install roof accessories to resist exposure to weather without failing, rattling, leaking, and fastener disengagement.

B. Install roof accessories to fit substrates and to result in watertight performance.

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 manufacturer.
1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.

2. Underlayment: Where installing exposed-to-view components of roof accessories directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene underlayment.
3. Bed flanges in thick coat of asphalt roofing cement where required by roof accessory manufacturers for waterproof performance.

D. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.

E. Roof Curb Installation:
1. Set roof curb so top surface of roof curb is level.
2. Attach roof curb according to manufacturer's written instructions

F. Equipment Support Installation:
1. Install support systems in accordance with manufacturer's instructions and approved shop drawings.
2. Accurately locate and align pre-fabricated pipe supports in locations specified as per approved shop drawings or as required herein and by site conditions to limit pipe and/or conduit deflection to L/240, not to exceed 10' (3m) on center. No Isolation pads are required under the 17" circular bases.
3. Should the roofing manufacturer require a separation sheet between the roof and the support system, place a separation sheet or protective pad conforming to the existing roof manufacturer's system under 17" circular bases. Do not adhere to the roof system or 17" circular bases.
4. If required, insert frame structures into 17" circular bases as indicated by manufacturer's instructions.
5. Adjust height of each strut or channel and hanger or roller to its required height and tighten with nut, but do not over-tighten. Check each support for equal weight disbursement. Correct if necessary.
6. Remove any unused materials and packaging from job site.

G. Preformed Flashing Installation:
1. Secure to roof membrane according to vent and stack flashing manufacturer's written instructions.

H. Roof Penetration Housing Installation:
1. Inspect substrate for readiness.
2. Clean surfaces thoroughly prior to installation.
3. Install in accordance with manufacturer's instructions.
4. Curb & Unit installed by Roofing Contractor.

I. Cast Iron Replacement Roof Drain Dome Installation:
1. Remove the existing roof drain dome. Remove the bolts from the membrane clamp ring one at a time and replace them with the provided hardware (MIFAB HS-18 or HS-19) ensuring to choose the right bolt size for your application.
2. Assemble the threaded rods into the body. Add the washer and nut onto the threaded rod, securing the membrane clamp ring to the body. Add another nut and washer to the threaded rod, one inch above the membrane clamp ring (adjusting nut).
3. Repeat this process until all bolts on the membrane clamp ring have been removed and replaced.

4. Place the RoofGuard over the drain body. Turn it until the slots in the top of the RoofGuard align with the threaded rods.
5. The RoofGuard needs to be 1/8” off of the roofing membrane. Use the adjusting nuts if necessary to attain this.
6. Add a washer and nut to the top of all of the threaded rods in order to secure the dome. Cut the excess thread off of the threaded rods.

J. Seal joints with elastomeric sealant as required by manufacturer of roof accessories.

3.03 TOUCH UP

A. Touch up factory-primed surfaces with compatible primer ready for field painting in accordance with Division 9 painting Sections.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.04 CLEANING

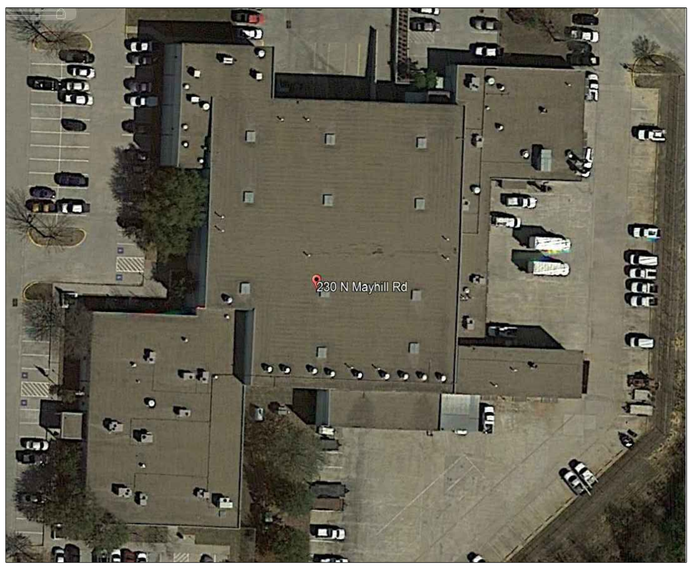
A. Clean exposed surfaces according to manufacturer’s written instructions.

END OF SECTION 07 72 00

DENTON ISD
1902-08 CSP
PARTIAL ROOF REPLACEMENTS OF SUMMER 2019
ANNEX BUILDING AND
McMATH MIDDLE SCHOOL
DENTON, TEXAS

VICINITY MAPS

N.T.S.



ANNEX BUILDING
230 N Mayhill Rd, Denton, TX 76208

McMATH MIDDLE SCHOOL
1900 Jason Drive, Denton, TX

DATE OF ISSUE: 100% CD'S
DATE: FEBRUARY 1, 2019

LIST OF DRAWINGS

ARMKO INDUSTRIES, INC.
Texas Registered
Engineering Firm F-6498
1320 Spinks Road
Flower Mound, TX 75028
(972)874-1388

STATE OF TEXAS
DEAN D. BROWN
117508
LICENSED
PROFESSIONAL ENGINEER

02/01/19

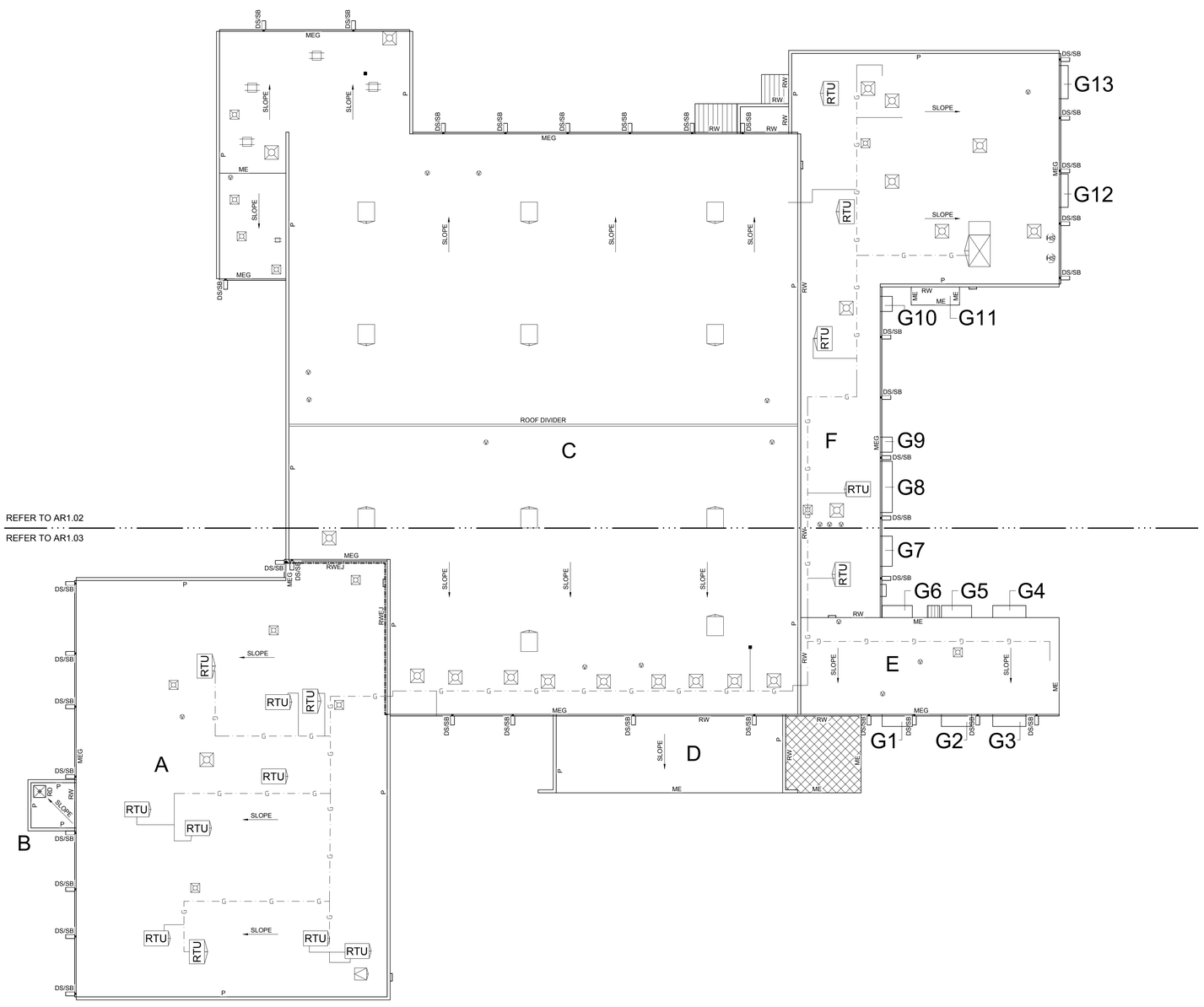
ISSUES

PROJECT FOR: DENTON ISD - 1902-08 CSP
PARTIAL ROOF REPLACEMENTS OF SUMMER 2019
SERVICE CENTER ANNEX AND
McMATH MIDDLE SCHOOL
DENTON, TEXAS

COVER SHEET

JOB 19-1010-56
DATE 02.01.19
DRAWN BY: JW
SHEET

G1.00



OVERALL ROOF PLAN - SERVICE CENTER ANNEX

1 NOT TO SCALE

NORTH

GENERAL ROOF NOTES

A. PROVIDE ALL REQUIRED UTILITY / STRUCTURAL COMPONENTS AND/OR CONNECTIONS FOR THE FUNCTIONAL USE OF ALL CONTRACTOR SUPPLIED EQUIPMENT OR APPLIANCES, REGARDLESS OF ANY OMISSIONS OR INCONSISTENCIES ENCOUNTERED IN THE CONSTRUCTION DOCUMENTS.
B. THE WORD 'PROVIDE' SHALL MEAN 'FURNISH AND INSTALL COMPLETE AND READY TO USE.'
C. IF DISCREPANCIES APPEAR BETWEEN THE DRAWINGS AND THE SPECIFICATIONS, THE HIGHER QUALITY, QUANTITY, AND PRICE SHALL SUPERSEDE.
D. THE GENERAL CONTRACTOR AND SUBCONTRACTORS SHALL BECOME FAMILIAR WITH THE PROJECT AND THE ON-SITE / OFF-SITE CONDITIONS PRIOR TO BIDDING OR COMMENCING WORK.
E. PROVIDE METAL END CLOSURE ON EXPANSION JOINTS WHERE THEY OCCUR AT THE EDGE OF THE ROOF.
F. ROOF SLOPES SHOWN ON DRAWING ARE GENERAL AND CONCEPTUAL ONLY. PROVIDE POSITIVE DRAINAGE TO ALL ROOF DRAINS. VERIFY TAPER IN SHOP DRAWINGS.
G. PROVIDE TAPERED INSULATION CRICKETS (1/2"/FT. MIN. SLOPE) AT HIGH SIDE OF ALL MECHANICAL UNITS SMOKE VENTS, ROOF HATCHES & OTHER MISC. ROOF PENETRATIONS, TO SHED WATER AROUND & TO ENSURE POSITIVE ROOF DRAINAGE.
H. PROVIDE ADDITIONAL FULLY ADHERED MEMBRANES AS PROTECTION AT "SERVICE SIDE" OF ALL MECH. EQUIPMENT - FIELD VERIFY LOCATIONS. AS WELL AS PROTECTION AT "ACCESS SIDE" OF ALL ROOF HATCHES AND ROOF ACCESS LADDERS FIELD VERIFY LOCATIONS AND AT DOWNSPOUT LOCATIONS.
I. ALL WOOD BLOCKING AT ROOF EDGES ARE TO BE FABRICATED FROM CONT. 2X6 FR-WD BOARDS. PROVIDE LARGER 2X FR-WD AS REQUIRED PER DIMENSIONED DETAILED OR AS FIELD CONDITIONS DICTATE. ALL COPING TO BE SLOPED TOWARD THE INTERIOR.
J. ALL EXPOSED FLASHING, COPING (IF APPLICABLE) AND THEIR ACCESSORIES SHALL BE AS SPECIFIED. PAINT ALL METAL FLASHING THAT IS NOT PREFINISHED (TYP) AND VISIBLE FROM THE GROUND.
K. HEIGHT OF ALL NAILERS SHALL BE FLUSH WITH NEW INSULATION THICKNESS
L. ALL THROUGH WALL FLASHING SYSTEMS TO ACCOMMODATE 8" MINIMUM FLASHING HEIGHT FROM FINISHED ROOF SURFACE. PROVIDE END DAMS AS CONDITIONS ALLOW. ALL FLASHING TO HAVE 4" LAP MINIMUM AND OR STEP.
M. ALL PITCH PANS SHALL BE DOUBLE SOLDERED STAINLESS STEEL AND RECEIVE EITHER MECHANICALLY ATTACHED GOOSENECK OR METAL BONNETS. METAL BONNETS SHALL BE SECURED WITH CLAMPING RING AND SEALANT. SPECIAL CARE GIVEN TO WASH ALL METAL PRIOR TO INSTALLATION.
N. ALL INFIELD EXPANSION JOINTS SHALL HAVE LOW SLOPED STANDING SEAM JOINTS AND SHALL BE CHAMFERED AT TERMINATION AT ROOF EDGE TO MEET PROFILE OF PERIMETER.
O. ANY CRACKS OR VOIDS IN RISE WALLS ABOVE COUNTER FLASHING SHALL BE REPAIRED WITH COMPATIBLE SEALANT.
P. PROVIDE NEW CONCRETE SPLASH BLOCKS ON ROOF ELEVATION SUPPORTED BY A WALK PAD WHERE DOWNSPOUTS OCCUR.
Q. ALL PIPE AND CONDUIT SHALL RECEIVE PIPE SUPPORTS AND RELATED SHIMS, AND SHALL BE PLACED ON AN ADDITIONAL FULLY ADHERED ROOF MEMBRANE UNDER SPECIFIED WALK PAD PRIOR TO SURFACE APPLICATION. SUPPORTS TO OCCUR AT 10'-0" O.C. AND WITHIN 2'-0" OF ALL SLOPES, TEES AND CORNERS. ALL PIPE TO BE PAINTED PER BUILDING CODE REQUIREMENTS.
R. ALL METAL FLASHING SHALL EXTEND BEYOND ROOF EDGE MIN. 8" WHERE FLASHING ABUTS VERTICAL WALL SURFACE AS DETAILED. ALL FLASHING SHALL BE INSTALLED IN SHINGLE FASHION.
S. AT ALL LOCATIONS WHERE CONVERGENCE OF MULTIPLE PLANE OF ROOFING TO WALL OCCURS, FIELD FABRICATE THERMOPLASTIC BOOT TO BE INSTALLED OVER NEW ROOFING, COMPLETELY OVERLAYING THE TRANSITIONS OF ALL ROOF TO WALL, ELEVATIONS, INSIDE / OUTSIDE 90'S ETC. PRIOR TO METAL INSTALLATION.
T. ALL EQUIPMENT CURBS TO BE RAISED AS NECESSARY TO MAINTAIN 10" MINIMUM HEIGHT ABOVE FINISHED ROOF SURFACE.
U. MECHANICAL, ELECTRICAL, AND PLUMBING ROOF EQUIPMENT SHOWN ON THIS PLAN IS FOR GENERAL INFORMATION ONLY.
V. FLASHING AND STRIPPING MATERIALS, BASE PLY SHEETS, MEMBRANES, INSULATION, AND ACCESSORIES SHOULD BE RECOMMENDED BY THE ROOFING SYSTEM MANUFACTURER FOR INTENDED USE AND COMPATIBILITY WITH THE MEMBRANE ROOFING SYSTEM.
W. WHERE WOOD BLOCKING EXCEEDS 6" IN VERTICAL THICKNESS AT TAPERED INSULATION, PROVIDE STEM WALL CONSTRUCTED OF 6" GALVANIZED COLD FORMED METAL FRAMING AT 16" O.C. WITH CON. TRACK AT TOP AND BOTTOM AND WITH 3/4" FR-EXT GRADE PLYWOOD AT EACH SIDE, TOP TO SLOPE WITH TAPERED INSULATION.
X. ALL VERTICAL MEMBRANE FLASHING SHALL BE MECHANICALLY FASTENED AND INSTALLED WITH NEW METAL COUNTER FLASHING UTILIZING A CONTINUOUS CLIP. SLIDE METAL COVER PLATE DOWN OVER VERTICAL CLIP AND SEAL.
Y. PROVIDE STEP FLASHING AND COVER PLATE AT SLOPED ROOF HI/LOW CONDITIONS.
Z. GUTTERS SHALL BE PREFINISHED GALVANIZED STEEL, SIZE TO MATCH EXISTING, UNO. PROVIDE PREFINISHED 1/4"x1 1/2" GALVANIZED STEEL BENT PLATE BRACKETS AND PREFINISHED 1" GALVANIZED STEEL SPACERS AT 36" O.C. MAX, STAGGER WITH EACH OTHER AT 18" O.C.
AA. PROVIDE PREFINISHED GUTTER EJ'S 30'-0" O.C. MAX.
AB. DOWNSPOUTS SHALL BE 5"x6" PREFINISHED GALVANIZED STEEL UNO AS INDICATED ON ROOF PLAN. PROVIDE PREFINISHED 2" GALVANIZED STEEL HANGERS AT 36" O.C. PROVIDE VANDAL PROOF STAINLESS STEEL STRAINERS AT EACH OUTLET. COORDINATE LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.
AC. PROVIDE CAST IRON BOOT PER TYP AT ALL DOWNSPOUTS THAT ARE TO GRADE.
AD. PROVIDE SPLASH BLOCKS AT ALL ROOF LEADER NOZZLES THAT SPILL ONTO GROUND.
AE. ROOF PLAN SHOWS TAPERED INSULATION CONCEPTUALLY AND FOR INTENT ONLY. TAPERED INSULATION IS NOT SHOWN TO SCALE AND IS SHOWN AS GRAPHIC REPRESENTATION ONLY IN ORDER TO SHOW SLOPE AND APPROXIMATE LOCATIONS OF MATERIAL. VERIFY INSULATION REQUIRED TO MAINTAIN SLOPE PRIOR TO INSTALLATION. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

SCOPE OF WORK

- METAL SLOPE IN DECK (ASSUMED)
- ALL LOW SLOPE ROOF AREAS
- TEAR OFF EXISTING LOW SLOPE ROOF TO THE DECK. REPAIR THE EXISTING ROOF DECK AS REQUIRED TO MAINTAIN A SMOOTH AND SOLID SUBSTRATE.
- FIELD VERIFY SLOPE AND CORES PRIOR TO STARTING WORK.
- INSTALL POLYISOCYANURATE INSULATION, EQUAL TO R25 MECHANICALLY ATTACHED.
- INSTALL 1/2" WOOD FIBER BOARD ADHERED IN HOT ASPHALT.
- INSTALL 1 PLY 80 MIL MODIFIED BITUMINOUS MEMBRANE BASE PLY ADHERED IN HOT ASPHALT
- PROVIDE 1 PLY 60 MIL CTEM CAP SHEET ADHERED IN HOT ASPHALT
- PROVIDE ASPHALT FLOOD COAT AND GRAVEL
- ADD ADDITIONAL TREATED WOOD NAILERS AROUND THE PERIMETER AND ALL PENETRATIONS TO MATCH NEW ROOF THICKNESS.
- REMOVE AND REPLACE ALL ASSOCIATED METAL TRIM AND COPING.
- PROVIDE 20 YEAR NDL WITH 4" HAIL COVERAGE.
- REMOVE AND REPLACE LOW SLOPE ROOF AT ALL EXTERIOR ROOF CANOPIES.

SATELLITE DISH
ANTENNA
SOIL/PLUMBING VENT
FLANGE MOUNTED EQUIPMENT
HOT STACK
CURB MOUNTED VENT
RTU ROOF TOP UNIT
CURB MOUNTED EQUIPMENT
MISCELLANEOUS EQUIPMENT ON PP
RD PRIMARY ROOF DRAIN
OD OVERFLOW ROOF DRAIN
RD OD PRIMARY AND OVERFLOW ROOF DRAIN
DS/SB DOWNSPOUT/ SPLASHBLOCK
EJ EXPANSION JOINT
ME/G METAL EDGE W/GUTTER
ME METAL EDGE
RW RISE WALL
RME RAISED METAL EDGE
RW/EJ RISE WALL W/EXPANSION JOINT
ROOF ACCESS LADDER
ROOF HATCH
SECURITY CAMERA
PITCH PAN
PROCESS VENT STACK
VENT STACK
FLANGE MOUNTED VENT
RTU PLENUM RTU ON PITCH PANS
MISCELLANEOUS EQUIPMENT
SC THROUGH WALL SCUPPER
NOS NEW OVERFLOW SCUPPER
OFS OVERFLOW SCUPPER
SC EDGE SCUPPER
DS/CH DOWNSPOUT/ COLLECTOR HEAD
DS DOWNSPOUT
RW RISE WALL METAL PANEL
P PARAPET
P/EJ EXPANSION JOINT AT PARAPET
SLOPE DIRECTION
SL SKYLIGHT

ROOF LEGEND

ROOF SYSTEM
NOT IN CONTRACT

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STATE OF TEXAS
DEAN D. BROWN
117908
LICENSED PROFESSIONAL ENGINEER
02/01/19

ISSUES

PROJECT FOR: DENTON ISD - 1902-08 CSP
PARTIAL ROOF REPLACEMENTS OF SUMMER 2019
SERVICE CENTER ANNEX
230 NORTH MAYHILL ROAD
DENTON, TX 76208

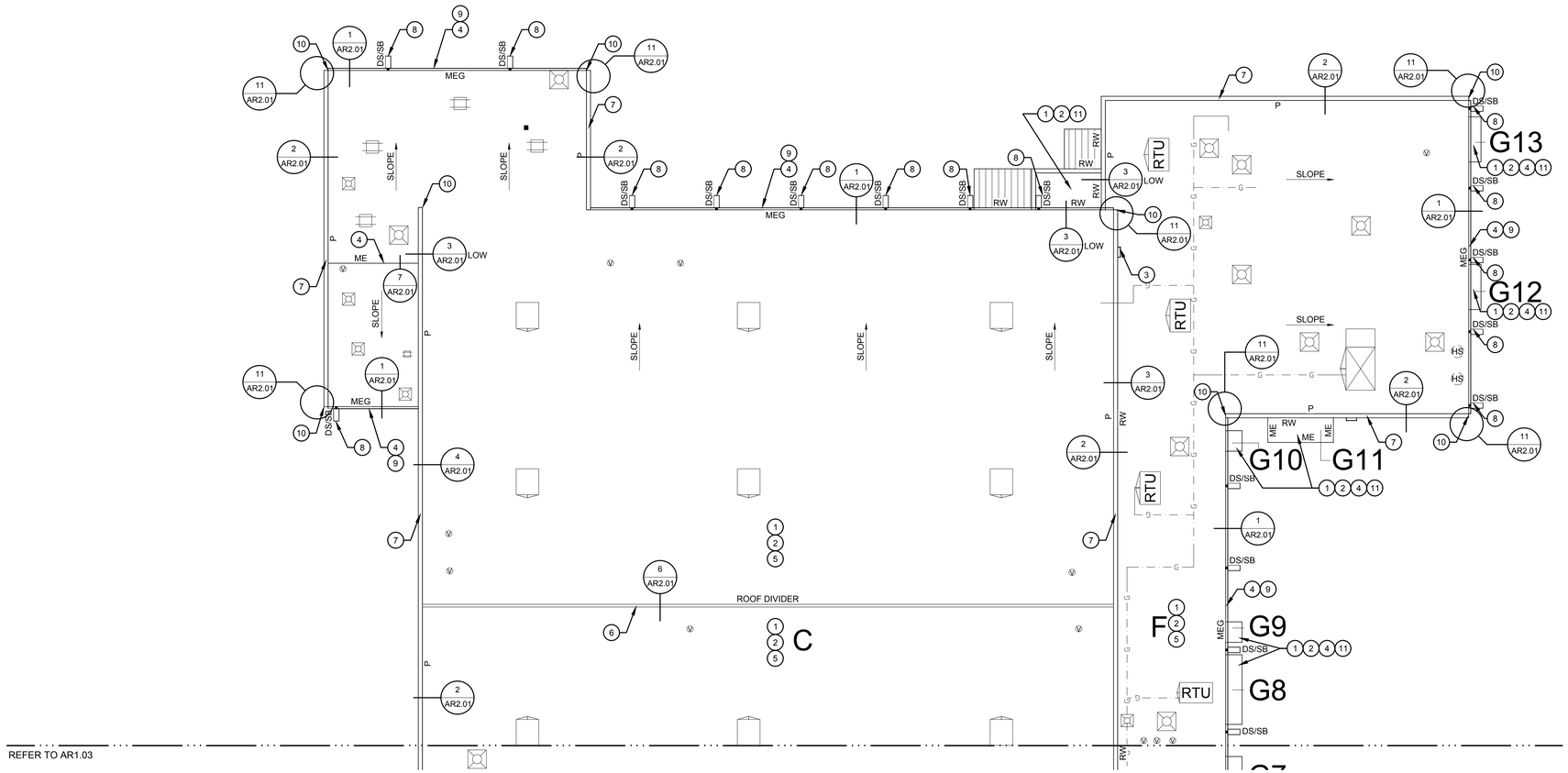
OVERALL ROOF PLAN AND GENERAL NOTES

JOB 19-1010-56
DATE 02.01.19
DRAWN BY: JW
SHEET

AR1.01

SPECIFIC ROOF NOTES

1. REMOVE EXISTING ROOF DOWN TO EXISTING ROOF DECK AND PREPARE EXISTING SUBSTRATE TO RECEIVE NEW ROOF SYSTEM.
2. PROVIDE NEW ROOF SYSTEM.
3. PROVIDE NEW ROOF TO ROOF LADDER AND PROVIDE ADDITIONAL WALK PAD AT ACCESSIBLE POINTS.
4. PROVIDE PRE-FINISHED METAL EDGE FLASHING.
5. PROVIDE NEW ROLLER SUPPORTS FOR EXISTING PIPING AND CONDUIT ABOVE ROOF.
6. PROVIDE NEW ROOF DIVIDER AS DETAILED.
7. REMOVE AND REPLACE EXISTING METAL COPING WITH NEW PRE-FINISHED METAL COPING. ADD NAILERS AS REQUIRED TO MAINTAIN 8" HEIGHT ABOVE ROOF.
8. PROVIDE CONCRETE SPLASH BLOCK.
9. REMOVE EXISTING METAL EDGE, GUTTER AND DOWN SPOUT AND REPLACE WITH NEW PRE-FINISHED METAL EDGE, GUTTER AND DOWN SPOUT.
10. PROVIDE PRE-FINISHED END CAP WHERE PARAPET TERMINATES.
11. PROVIDE 1/4" PT TAPERED INSULATION.



NORTH

ENLARGED ROOF PLANS - SERVICE CENTER ANNEX

NOT TO SCALE

SATELLITE DISH · ANTENNA · SOIL/PLUMBING VENT · FLANGE MOUNTED EQUIPMENT · HOT STACK · CURB MOUNTED VENT

ROOF ACCESS LADDER · ROOF HATCH · SECURITY CAMERA · PITCH PAN · PROCESS VENT STACK · VENT STACK · FLANGE MOUNTED VENT

RTU ROOF TOP UNIT · RTU PLENUM RTU ON PITCH PANS · CURB MOUNTED EQUIPMENT · MISCELLANEOUS EQUIPMENT · MISCELLANEOUS EQUIPMENT ON PP · SC THROUGH WALL SCUPPER

RD PRIMARY ROOF DRAIN · NOS NEW OVERFLOW SCUPPER · OD OVERFLOW ROOF DRAIN · OFS OVERFLOW SCUPPER · RD OD PRIMARY AND OVERFLOW ROOF DRAIN · SC EDGE SCUPPER

DS/SB DOWNSPOUT/ SPLASHBLOCK · DS/CH DOWNSPOUT/ COLLECTOR HEAD · EJ EXPANSION JOINT · DS DOWNSPOUT · ME/G METAL EDGE W/GUTTER · RW RISE WALL METAL PANEL · ME METAL EDGE · P PARAPET · RW RISE WALL · P/EJ EXPANSION JOINT AT PARAPET · RME RAISED METAL EDGE · SLOPE DIRECTION · RW/EJ RISE WALL W/EXPANSION JOINT · SL SKYLIGHT

ROOF LEGEND

- ROOF SYSTEM
- NOT IN CONTRACT

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STATE OF TEXAS · DEAN D. BROWN · 117508 · LICENSED PROFESSIONAL ENGINEER

02/01/19

ISSUES

PROJECT FOR: DENTON ISD - 1902-08 CSP
PARTIAL ROOF REPLACEMENTS OF SUMMER 2019
SERVICE CENTER ANNEX
230 NORTH MAYHILL ROAD
DENTON, TX 76208

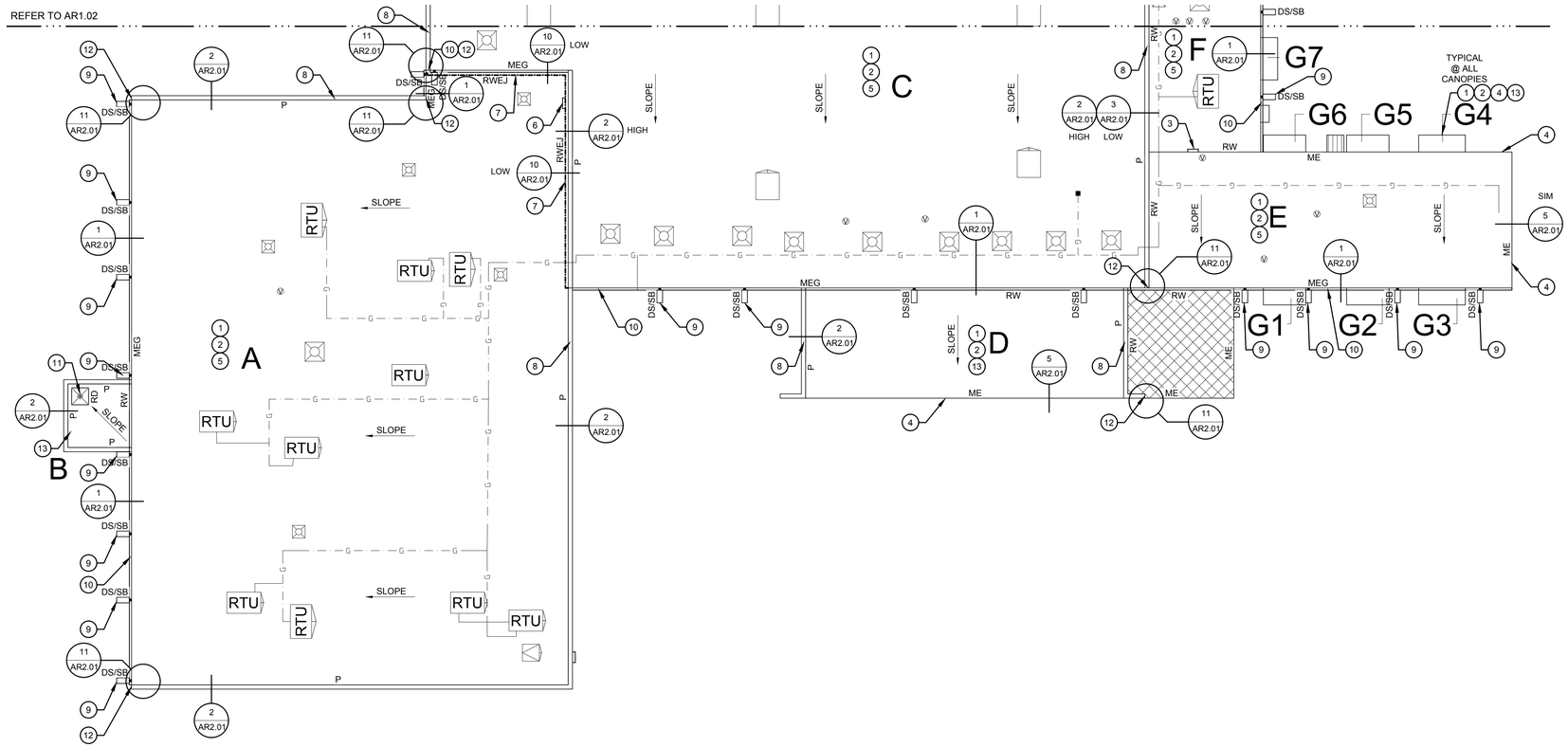
ENLARGED ROOF PLAN AND SPECIFIC NOTES

JOB 19-1010-56
DATE 02.01.19
DRAWN BY: JW
SHEET

AR1.02

SPECIFIC ROOF NOTES

1. REMOVE EXISTING ROOF DOWN TO EXISTING ROOF DECK AND PREPARE EXISTING SUBSTRATE TO RECEIVE NEW ROOF SYSTEM.
2. PROVIDE NEW ROOF SYSTEM.
3. PAINT EXISTING ROOF TO ROOF LADDER AND PROVIDE ADDITIONAL WALK PAD AT ACCESSIBLE POINTS.
4. PROVIDE PRE-FINISHED METAL EDGE FLASHING.
5. PROVIDE NEW ROLLER SUPPORTS FOR EXISTING PIPING AND CONDUIT ABOVE ROOF.
6. PROVIDE NEW ROOF TO ROOF ACCESS LADDER.
7. PROVIDE ROOF TO RISE WALL EXPANSION JOINT FLASHING.
8. REMOVE AND REPLACE EXISTING METAL COPING WITH NEW PRE-FINISHED METAL COPING. ADD NAILERS AS REQUIRED TO MAINTAIN 8" HEIGHT ABOVE ROOF.
9. PROVIDE CONCRETE SPLASH BLOCK.
10. REMOVE EXISTING METAL EDGE, GUTTER AND DOWN SPOUT AND REPLACE WITH NEW PRE-FINISHED METAL EDGE, GUTTER AND DOWN SPOUT.
11. ENLARGE EXISTING ROOF DRAIN SUMP.
12. PROVIDE PRE-FINISHED END CAP WHERE PARAPET TERMINATES.
13. PROVIDE 1/4" PT TAPERED INSULATION.



NORTH

ENLARGED ROOF PLANS - SERVICE CENTER ANNEX

NOT TO SCALE

ROOF LEGEND

- ROOF SYSTEM
- NOT IN CONTRACT

ROOF ACCESS LADDER · ROOF HATCH · SATELLITE DISH · ANTENNA · SECURITY CAMERA · SOIL/PLUMBING VENT · PITCH PAN · FLANGE MOUNTED EQUIPMENT · PROCESS VENT STACK · HOT STACK · VENT STACK · CURB MOUNTED VENT · FLANGE MOUNTED VENT · ROOF TOP UNIT · PLENUM RTU ON PITCH PANS · CURB MOUNTED EQUIPMENT · MISCELLANEOUS EQUIPMENT · MISCELLANEOUS EQUIPMENT ON PP · SC THROUGH WALL SCUPPER · RD PRIMARY ROOF DRAIN · NOS NEW OVERFLOW SCUPPER · OD OVERFLOW ROOF DRAIN · OFS OVERFLOW SCUPPER · RD OD PRIMARY AND OVERFLOW ROOF DRAIN · SC EDGE SCUPPER · DS/SB DOWNSPOUT/ SPLASHBLOCK · DS/CH DOWNSPOUT/ COLLECTOR HEAD · EJ EXPANSION JOINT · DS DOWNSPOUT · ME/G METAL EDGE W/GUTTER · RW RISE WALL METAL PANEL · ME METAL EDGE · P PARAPET · RW RISE WALL · P/EJ EXPANSION JOINT AT PARAPET · RME RAISED METAL EDGE · SLOPE DIRECTION · RW/EJ RISE WALL W/EXPANSION JOINT · SL SKYLIGHT

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PARTIAL ROOF REPLACEMENTS OF SUMMER 2019
SERVICE CENTER ANNEX
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DENTON, TX 76208

ENLARGED ROOF PLAN AND SPECIFIC NOTES

JOB 19-1010-56
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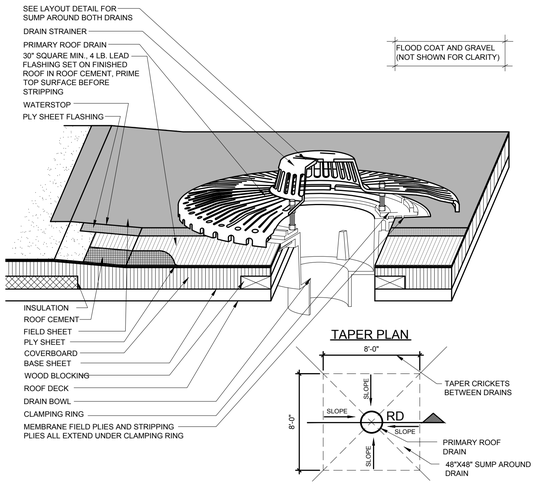
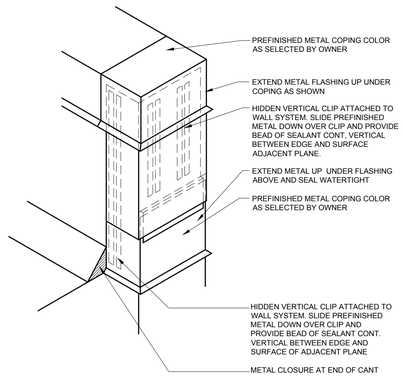
DRAWN BY: JW
SHEET

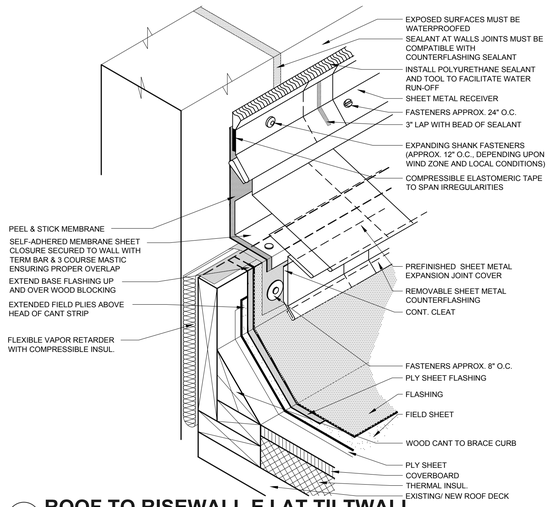
AR1.03



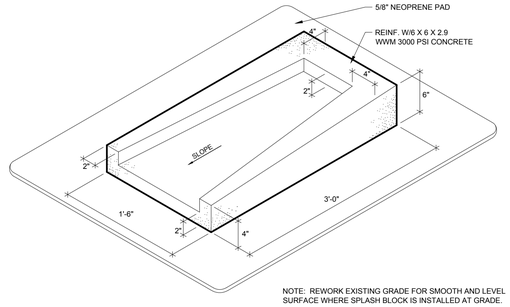
12 MAIN ROOF DRAIN
NOT TO SCALE



11 PARAPET END TERMINATION
NOT TO SCALE

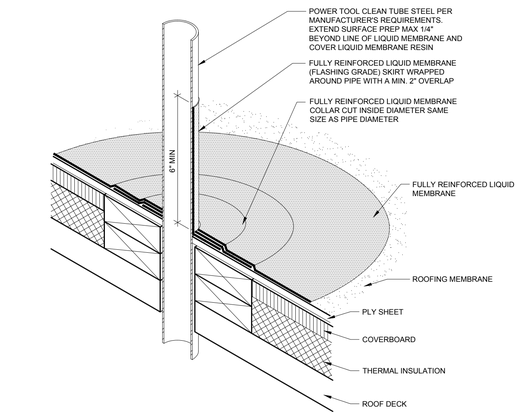


10 ROOF TO RISEWALL EJ AT TILTWALL
NOT TO SCALE



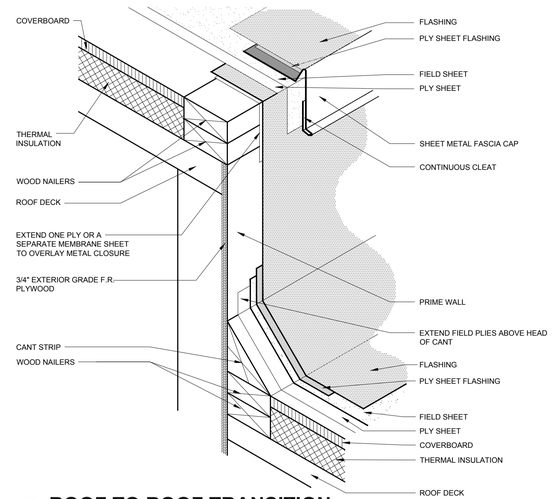
NOTE: REWORK EXISTING GRADE FOR SMOOTH AND LEVEL SURFACE WHERE SPLASH BLOCK IS INSTALLED AT GRADE.

9 SPLASH BLOCK
NOT TO SCALE



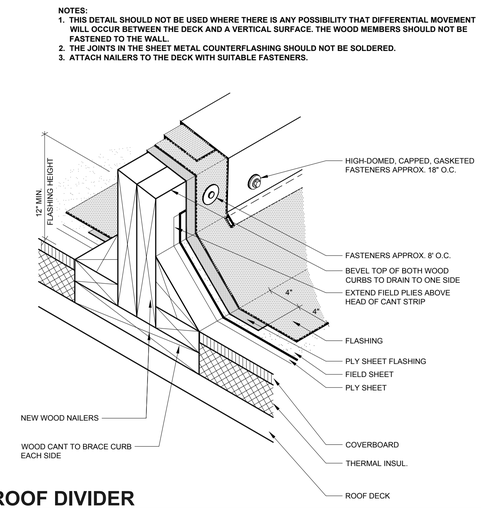
A FULLY REINFORCED LIQUID MEMBRANE SYSTEM IS DEFINED AS AN ASSEMBLY CONSISTING OF TWO LIQUID RESIN APPLICATIONS AND FABRIC REINFORCEMENT INSTALLED BETWEEN RESIN LAYERS

8 VENT STACK
NOT TO SCALE

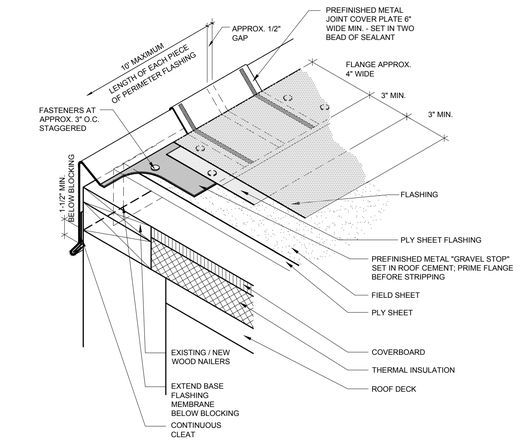


7 ROOF TO ROOF TRANSITION
NOT TO SCALE

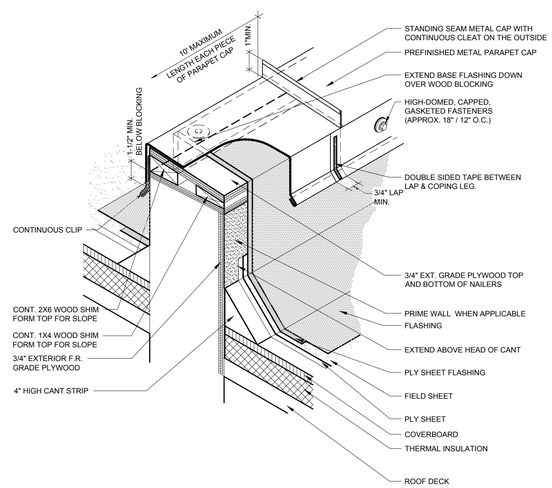
NOTES:
1. **THIS DETAIL SHOULD NOT BE USED WHERE THERE IS ANY POSSIBILITY THAT DIFFERENTIAL MOVEMENT WILL OCCUR BETWEEN THE DECK AND A VERTICAL SURFACE. THE WOOD MEMBERS SHOULD NOT BE FASTENED TO THE WALL.**
2. **THE JOINTS IN THE SHEET METAL COUNTERFLASHING SHOULD NOT BE SOLDERED.**
3. **ATTACH NAILERS TO THE DECK WITH SUITABLE FASTENERS.**



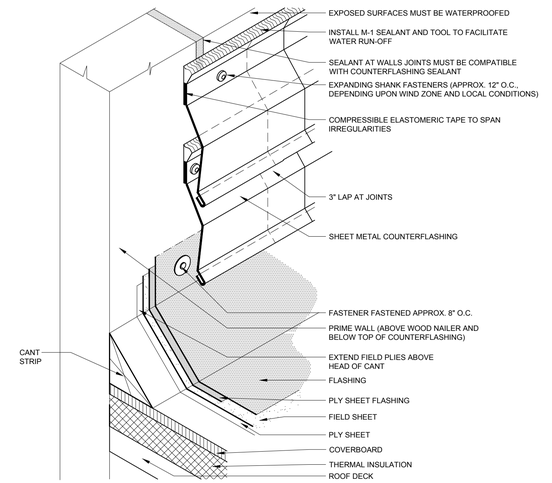
6 ROOF DIVIDER
NOT TO SCALE



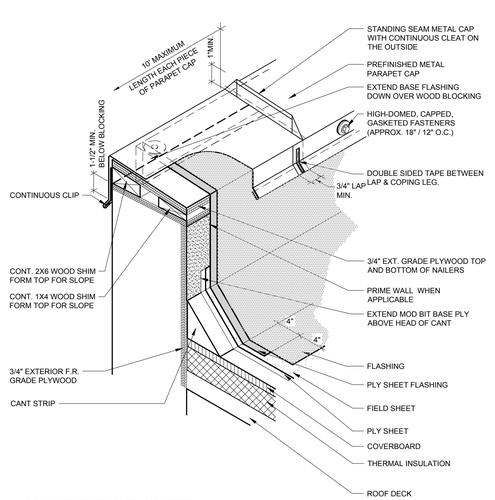
5 METAL EDGE
NOT TO SCALE



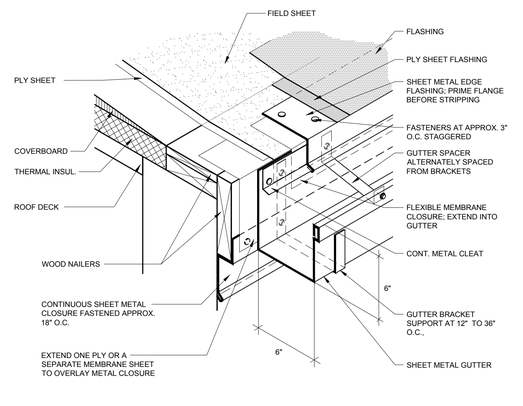
4 ROOF TO ROOF PARAPET
NOT TO SCALE



3 ROOF TO RISEWALL AT TILT WALL
NOT TO SCALE



2 SHORT PARAPET
NOT TO SCALE



1 METAL EDGE GUTTER
NOT TO SCALE

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02/01/19

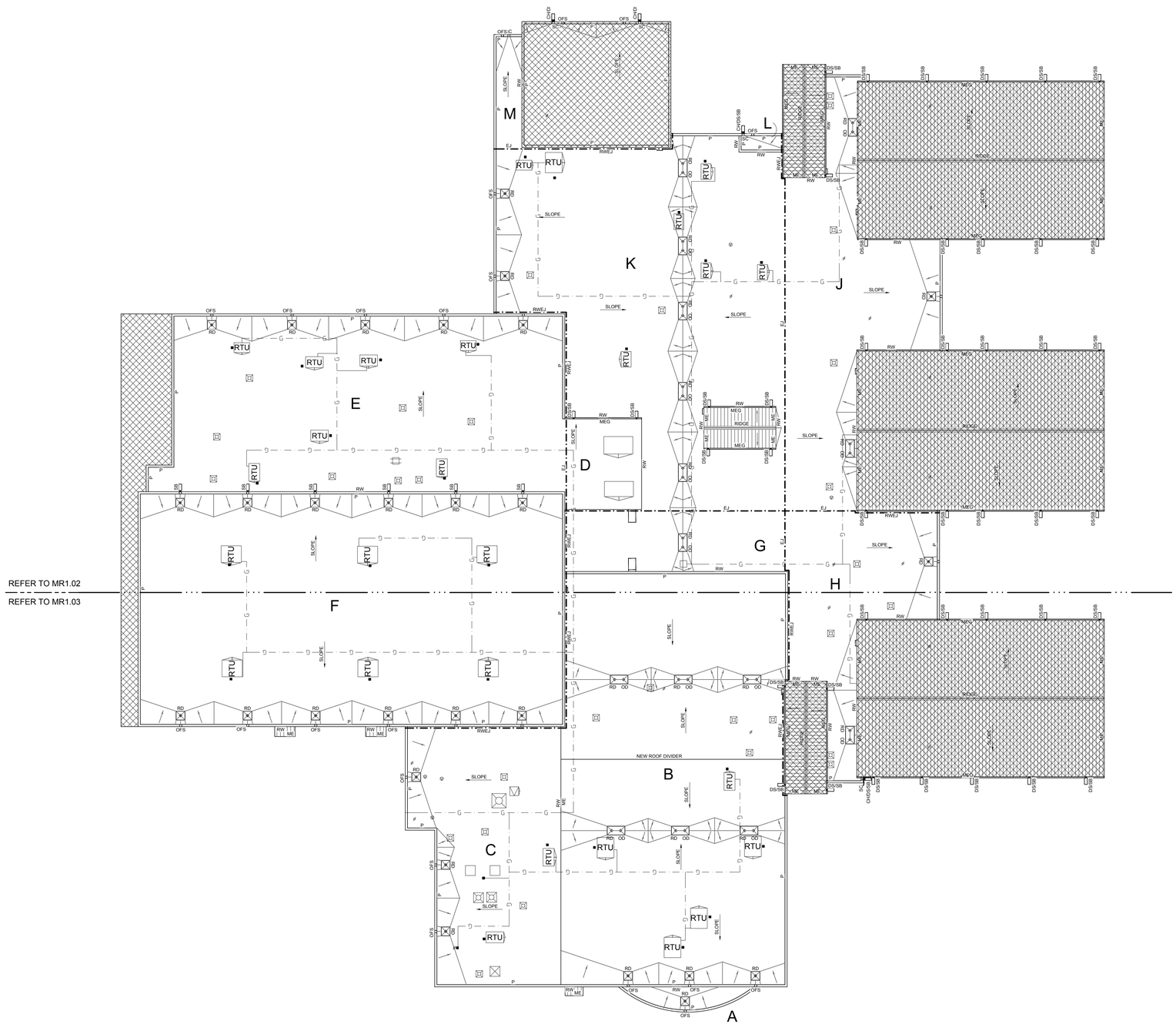
ISSUES

PROJECT FOR: DENTON ISD - 1902-08 CSP
PARTIAL ROOF REPLACEMENTS OF SUMMER 2019
SERVICE CENTER ANNEX
230 NORTH MAYHILL ROAD
DENTON, TX 76208

ROOF DETAILS

JOB 19-1010-56
DATE 02.01.19
DRAWN BY: JW
SHEET

AR2.01



1 **OVERALL ROOF PLAN - McMATH MIDDLE SCHOOL**
NOT TO SCALE

GENERAL ROOF NOTES

A. PROVIDE ALL REQUIRED UTILITY / STRUCTURAL COMPONENTS AND/OR CONNECTIONS FOR THE FUNCTIONAL USE OF ALL CONTRACTOR SUPPLIED EQUIPMENT OR APPLIANCES, REGARDLESS OF ANY OMISSIONS OR INCONSISTENCIES ENCOUNTERED IN THE CONSTRUCTION DOCUMENTS.
B. THE WORD 'PROVIDE' SHALL MEAN 'FURNISH AND INSTALL COMPLETE AND READY TO USE.'
C. IF DISCREPANCIES APPEAR BETWEEN THE DRAWINGS AND THE SPECIFICATIONS, THE HIGHER QUALITY, QUANTITY, AND PRICE SHALL SUPERSEDE.
D. THE GENERAL CONTRACTOR AND SUBCONTRACTORS SHALL BECOME FAMILIAR WITH THE PROJECT AND THE ON-SITE / OFF-SITE CONDITIONS PRIOR TO BIDDING OR COMMENCING WORK.
E. PROVIDE METAL END CLOSURE ON EXPANSION JOINTS WHERE THEY OCCUR AT THE EDGE OF THE ROOF.
F. ROOF SLOPES SHOWN ON DRAWING ARE GENERAL AND CONCEPTUAL ONLY. PROVIDE POSITIVE DRAINAGE TO ALL ROOF DRAINS. VERIFY TAPER IN SHOP DRAWINGS.
G. PROVIDE TAPERED INSULATION CRICKETS (1/2"/FT. MIN. SLOPE) AT HIGH SIDE OF ALL MECHANICAL UNITS SMOKE VENTS, ROOF HATCHES & OTHER MISC. ROOF PENETRATIONS, TO SHED WATER AROUND & TO ENSURE POSITIVE ROOF DRAINAGE.
H. PROVIDE ADDITIONAL FULLY ADHERED MEMBRANES AS PROTECTION AT "SERVICE SIDE" OF ALL MECH. EQUIPMENT - FIELD VERIFY LOCATIONS. AS WELL AS PROTECTION AT "ACCESS SIDE" OF ALL ROOF HATCHES AND ROOF ACCESS LADDERS FIELD VERIFY LOCATIONS AND AT DOWNSPOUT LOCATIONS.
I. ALL WOOD BLOCKING AT ROOF EDGES ARE TO BE FABRICATED FROM CONT. 2X6 FR-WD BOARDS. PROVIDE LARGER 2X FR-WD AS REQUIRED PER DIMENSIONED DETAILED OR AS FIELD CONDITIONS DICTATE. ALL COPING TO BE SLOPED TOWARD THE INTERIOR.
J. ALL EXPOSED FLASHING, COPING (IF APPLICABLE) AND THEIR ACCESSORIES SHALL BE AS SPECIFIED. PAINT ALL METAL FLASHING THAT IS NOT PREFINISHED (TYP) AND VISIBLE FROM THE GROUND.
K. HEIGHT OF ALL NAILERS SHALL BE FLUSH WITH NEW INSULATION THICKNESS
L. ALL THROUGH WALL FLASHING SYSTEMS TO ACCOMMODATE 8" MINIMUM FLASHING HEIGHT FROM FINISHED ROOF SURFACE. PROVIDE END DAMS AS CONDITIONS ALLOW. ALL FLASHING TO HAVE 4" LAP MINIMUM AND OR STEP.
M. ALL PITCH PANS SHALL BE DOUBLE SOLDERED STAINLESS STEEL AND RECEIVE EITHER MECHANICALLY ATTACHED GOOSENECK OR METAL BONNETS. METAL BONNETS SHALL BE SECURED WITH CLAMPING RING AND SEALANT. SPECIAL CARE GIVEN TO WASH ALL METAL PRIOR TO INSTALLATION.
N. ALL INFIELD EXPANSION JOINTS SHALL HAVE LOW SLOPED STANDING SEAM JOINTS AND SHALL BE CHAMFERED AT TERMINATION AT ROOF EDGE TO MEET PROFILE OF PERIMETER.
O. ANY CRACKS OR VOIDS IN RISE WALLS ABOVE COUNTER FLASHING SHALL BE REPAIRED WITH COMPATIBLE SEALANT.
P. PROVIDE NEW CONCRETE SPLASH BLOCKS ON ROOF ELEVATION SUPPORTED BY A WALK PAD WHERE DOWNSPOUTS OCCUR.
Q. ALL PIPE AND CONDUIT SHALL RECEIVE PIPE SUPPORTS AND RELATED SHIMS, AND SHALL BE PLACED ON AN ADDITIONAL FULLY ADHERED ROOF MEMBRANE UNDER SPECIFIED WALK PAD PRIOR TO SURFACE APPLICATION. SUPPORTS TO OCCUR AT 10'-0" O.C. AND WITHIN 2'-0" OF ALL SLOPES, TEES AND CORNERS. ALL PIPE TO BE PAINTED PER BUILDING CODE REQUIREMENTS.
R. ALL METAL FLASHING SHALL EXTEND BEYOND ROOF EDGE MIN. 8" WHERE FLASHING ABUTS VERTICAL WALL SURFACE AS DETAILED. ALL FLASHING SHALL BE INSTALLED IN SHINGLE FASHION.
S. AT ALL LOCATIONS WHERE CONVERGENCE OF MULTIPLE PLANE OF ROOFING TO WALL OCCURS, FIELD FABRICATE THERMOPLASTIC BOOT TO BE INSTALLED OVER NEW ROOFING, COMPLETELY OVERLAYING THE TRANSITIONS OF ALL ROOF TO WALL, ELEVATIONS, INSIDE / OUTSIDE 90'S ETC. PRIOR TO METAL INSTALLATION.
T. ALL EQUIPMENT CURBS TO BE RAISED AS NECESSARY TO MAINTAIN 10" MINIMUM HEIGHT ABOVE FINISHED ROOF SURFACE.
U. MECHANICAL, ELECTRICAL, AND PLUMBING ROOF EQUIPMENT SHOWN ON THIS PLAN IS FOR GENERAL INFORMATION ONLY.
V. FLASHING AND STRIPPING MATERIALS, BASE PLY SHEETS, MEMBRANES, INSULATION, AND ACCESSORIES SHOULD BE RECOMMENDED BY THE ROOFING SYSTEM MANUFACTURER FOR INTENDED USE AND COMPATIBILITY WITH THE MEMBRANE ROOFING SYSTEM.
W. WHERE WOOD BLOCKING EXCEEDS 6" IN VERTICAL THICKNESS AT TAPERED INSULATION, PROVIDE STEM WALL CONSTRUCTED OF 6" GALVANIZED COLD FORMED METAL FRAMING AT 16" O.C. WITH CON. TRACK AT TOP AND BOTTOM AND WITH 3/4" FR-EXT GRADE PLYWOOD AT EACH SIDE, TOP TO SLOPE WITH TAPERED INSULATION.
X. ALL VERTICAL MEMBRANE FLASHING SHALL BE MECHANICALLY FASTENED AND INSTALLED WITH NEW METAL COUNTER FLASHING UTILIZING A CONTINUOUS CLIP. SLIDE METAL COVER PLATE DOWN OVER VERTICAL CLIP AND SEAL.
Y. PROVIDE STEP FLASHING AND COVER PLATE AT SLOPED ROOF HI/LOW CONDITIONS.
Z. GUTTERS SHALL BE PREFINISHED GALVANIZED STEEL, SIZE TO MATCH EXISTING, UNO. PROVIDE PREFINISHED 1/4"x1 1/2" GALVANIZED STEEL BENT PLATE BRACKETS AND PREFINISHED 1" GALVANIZED STEEL SPACERS AT 36" O.C. MAX, STAGGER WITH EACH OTHER AT 18" O.C.
AA. PROVIDE PREFINISHED GUTTER EJ'S 30'-0" O.C. MAX.
AB. DOWNSPOUTS SHALL BE 5"x6" PREFINISHED GALVANIZED STEEL UNO AS INDICATED ON ROOF PLAN. PROVIDE PREFINISHED 2" GALVANIZED STEEL HANGERS AT 36" O.C. PROVIDE VANDAL PROOF STAINLESS STEEL STRAINERS AT EACH OUTLET. COORDINATE LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.
AC. PROVIDE CAST IRON BOOT PER TYP AT ALL DOWNSPOUTS THAT ARE TO GRADE.
AD. PROVIDE SPLASH BLOCKS AT ALL ROOF LEADER NOZZLES THAT SPILL ONTO GROUND.
AE. ROOF PLAN SHOWS TAPERED INSULATION CONCEPTUALLY AND FOR INTENT ONLY. TAPERED INSULATION IS NOT SHOWN TO SCALE AND IS SHOWN AS GRAPHIC REPRESENTATION ONLY IN ORDER TO SHOW SLOPE AND APPROXIMATE LOCATIONS OF MATERIAL. VERIFY INSULATION REQUIRED TO MAINTAIN SLOPE PRIOR TO INSTALLATION. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

SCOPE OF WORK

- METAL SLOPE IN DECK (ASSUMED)
- ALL LOW SLOPE ROOF AREAS
- TEAR OFF EXISTING LOW SLOPE ROOF TO THE DECK. REPAIR THE EXISTING ROOF DECK AS REQUIRED TO MAINTAIN A SMOOTH AND SOLID SUBSTRATE.
- FIELD VERIFY SLOPE AND CORES PRIOR TO STARTING WORK.
- INSTALL POLYISOCYANURATE INSULATION, EQUAL TO R25 MECHANICALLY ATTACHED.
- PROVIDE 1/2" WOOD FIBER COVERBOARD ADHEARED IN HOT ASPHALT.
- INSTALL 1 PLY 80 MIL MODIFIED BITUMINOUS MEMBRANE BASE PLY ADHERED IN HOT ASPHALT
- PROVIDE 1 PLY 60 MIL CTEM CAP SHEET ADHERED IN HOT ASPHALT
- PROVIDE ASPHALT FLOOD COAT AND GRAVEL
- ADD ADDITIONAL TREATED WOOD NAILERS AROUND THE PERIMETER AND ALL PENETRATIONS TO MATCH NEW ROOF THICKNESS.
- REMOVE AND REPLACE ALL ASSOCIATED METAL TRIM AND COPING.
- PROVIDE 20 YEAR NDL WITH 4" HAIL COVERAGE.

- REMOVE AND REPLACE EXISTING METAL ROOF VENT STACK BOOTS AT ALL EXISTING STANDING SEAM METAL ROOF AREAS WITH NEW FLEXIBLE BOOTS, SIZE, STYLE, AND COLOR TO MATCH EXISTING.

ROOF ACCESS LADDER · ROOF HATCH · SATELLITE DISH · ANTENNA · SECURITY CAMERA · SOIL/PLUMBING VENT · PITCH PAN · FLANGE MOUNTED EQUIPMENT · PROCESS VENT STACK · HOT STACK · VENT STACK · CURB MOUNTED VENT · FLANGE MOUNTED VENT · RTU ROOF TOP UNIT · RTU PLENUM RTU ON PITCH PANS · CURB MOUNTED EQUIPMENT · MISCELLANEOUS EQUIPMENT · MISCELLANEOUS EQUIPMENT ON PP SC THROUGH WALL SCUPPER · RD PRIMARY ROOF DRAIN NOS NEW OVERFLOW SCUPPER · OD OVERFLOW ROOF DRAIN OFS OVERFLOW SCUPPER · RD OD PRIMARY AND OVERFLOW ROOF DRAIN SC EDGE SCUPPER · DS/SB DOWNSPOUT/ SPLASHBLOCK · DS/CH DOWNSPOUT/ COLLECTOR HEAD · EJ EXPANSION JOINT · DS DOWNSPOUT · ME/G METAL EDGE W/GUTTER · RW RISE WALL METAL PANEL · ME METAL EDGE · P PARAPET · RW RISE WALL · P/EJ EXPANSION JOINT AT PARAPET · RME RAISED METAL EDGE · SLOPE DIRECTION · RW/EJ RISE WALL W/EXPANSION JOINT · SL SKYLIGHT

ROOF LEGEND

ROOF SYSTEM
NOT IN CONTRACT

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ISSUES

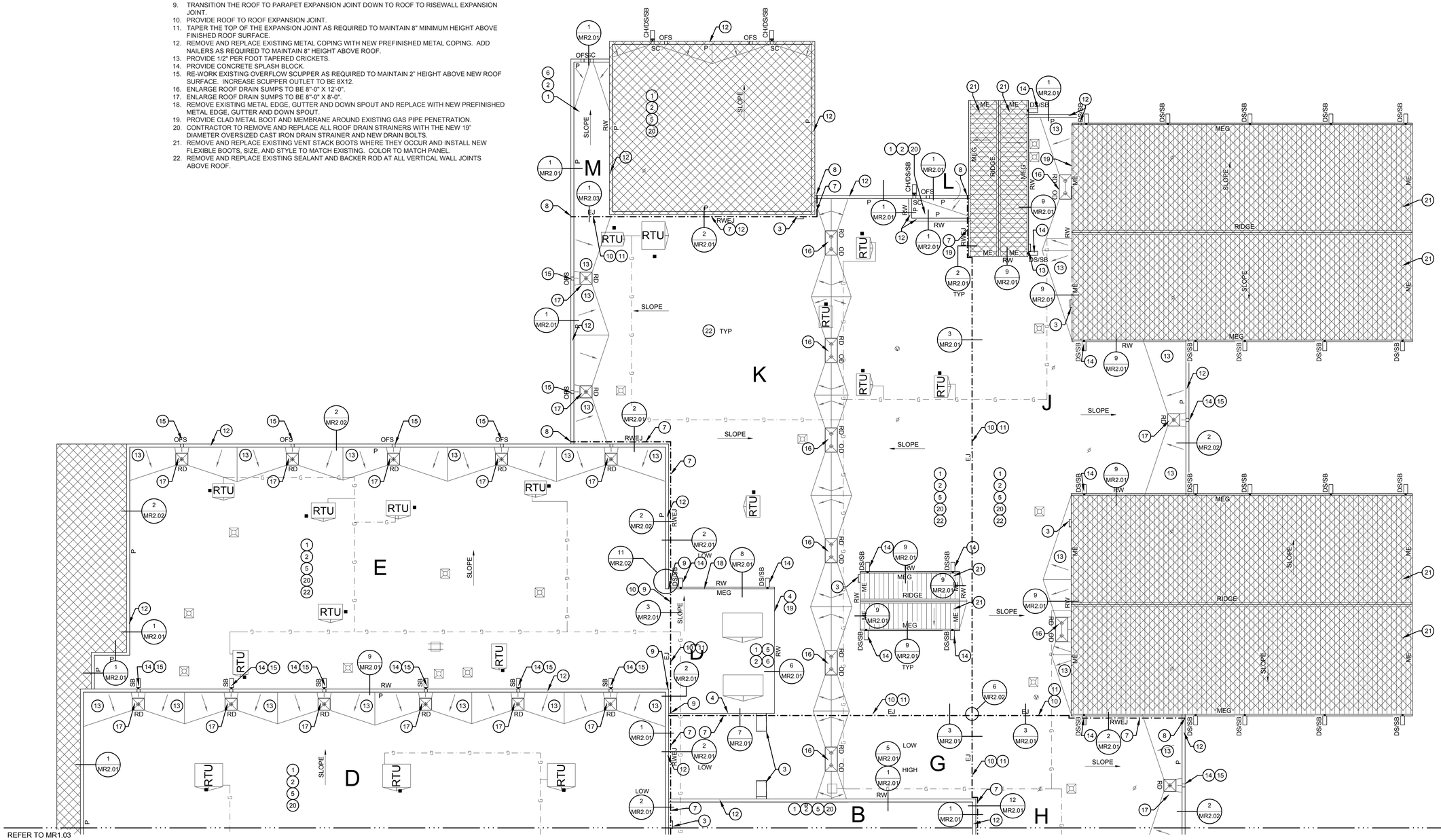
PROJECT FOR: DENTON ISD - 1902-08 CSP
PARTIAL ROOF REPLACEMENTS OF SUMMER 2019
McMATH MIDDLE SCHOOL
1900 JASON DRIVE
DENTON, TX 76205

OVERALL ROOF PLAN AND GENERAL NOTES
JOB 19-1010-56
DATE 02.01.19
DRAWN BY: JW
SHEET

MR1.01

SPECIFIC ROOF NOTES

1. REMOVE EXISTING ROOF DOWN TO EXISTING ROOF DECK AND PREPARE EXISTING SUBSTRATE TO RECEIVE NEW ROOF SYSTEM.
2. PROVIDE NEW ROOF SYSTEM.
3. PAINT EXISTING ROOF TO ROOF LADDER AND PROVIDE ADDITIONAL WALK PAD AT ACCESSIBLE POINTS.
4. PROVIDE PREFINISHED METAL EDGE FLASHING.
5. PROVIDE NEW ROLLER SUPPORTS FOR EXISTING PIPING AND CONDUIT ABOVE ROOF.
6. PROVIDE TAPERED INSULATION TO PROVIDE POSITIVE DRAINAGE TOWARDS ROOF GUTTERS 1/4" PER FOOT SLOPE.
7. PROVIDE ROOF TO RISE WALL EXPANSION JOINT FLASHING.
8. EXTEND EXPANSION JOINT THROUGH THE PARAPET AND FLASH WATERTIGHT. COVER WITH METAL FLASHING.
9. TRANSITION THE ROOF TO PARAPET EXPANSION JOINT DOWN TO ROOF TO RISEWALL EXPANSION JOINT.
10. PROVIDE ROOF TO ROOF EXPANSION JOINT.
11. TAPER THE TOP OF THE EXPANSION JOINT AS REQUIRED TO MAINTAIN 8" MINIMUM HEIGHT ABOVE FINISHED ROOF SURFACE.
12. REMOVE AND REPLACE EXISTING METAL COPING WITH NEW PREFINISHED METAL COPING. ADD NAILERS AS REQUIRED TO MAINTAIN 8" HEIGHT ABOVE ROOF.
13. PROVIDE 1/2" PER FOOT TAPERED CRICKETS.
14. PROVIDE CONCRETE SPLASH BLOCK.
15. RE-WORK EXISTING OVERFLOW SCUPPER AS REQUIRED TO MAINTAIN 2" HEIGHT ABOVE NEW ROOF SURFACE. INCREASE SCUPPER OUTLET TO BE 8X12.
16. ENLARGE ROOF DRAIN SUMPS TO BE 8"-0" X 12'-0".
17. ENLARGE ROOF DRAIN SUMPS TO BE 8"-0" X 8'-0".
18. REMOVE EXISTING METAL EDGE, GUTTER AND DOWN SPOUT AND REPLACE WITH NEW PREFINISHED METAL EDGE, GUTTER AND DOWN SPOUT.
19. PROVIDE CLAD METAL BOOT AND MEMBRANE AROUND EXISTING GAS PIPE PENETRATION.
20. CONTRACTOR TO REMOVE AND REPLACE ALL ROOF DRAIN STRAINERS WITH THE NEW 19" DIAMETER OVERSIZED CAST IRON DRAIN STRAINER AND NEW DRAIN BOLTS.
21. REMOVE AND REPLACE EXISTING VENT STACK BOOTS WHERE THEY OCCUR AND INSTALL NEW FLEXIBLE BOOTS, SIZE, AND STYLE TO MATCH EXISTING. COLOR TO MATCH PANEL.
22. REMOVE AND REPLACE EXISTING SEALANT AND BACKER ROD AT ALL VERTICAL WALL JOINTS ABOVE ROOF.



NORTH

ENLARGED ROOF PLANS - McMATH MIDDLE SCHOOL

1 NOT TO SCALE

ROOF LEGEND

- ROOF SYSTEM
- NOT IN CONTRACT

SATELLITE DISH; ANTENNA; SOIL/PLUMBING VENT; FLANGE MOUNTED EQUIPMENT; HOT STACK; CURB MOUNTED VENT; ROOF TOP UNIT; CURB MOUNTED EQUIPMENT; MISCELLANEOUS EQUIPMENT ON PP; PRIMARY ROOF DRAIN; OVERFLOW ROOF DRAIN; PRIMARY AND OVERFLOW ROOF DRAIN; DOWNSPOUT/ SPLASHBLOCK; EXPANSION JOINT; METAL EDGE W/GUTTER; METAL EDGE; RISE WALL; RAISED METAL EDGE; RISE WALL W/EXPANSION JOINT

ROOF ACCESS LADDER; ROOF HATCH; SECURITY CAMERA; PITCH PAN; PROCESS VENT STACK; VENT STACK; FLANGE MOUNTED VENT; PLENUM RTU ON PITCH PANS; MISCELLANEOUS EQUIPMENT; THROUGH WALL SCUPPER; NEW OVERFLOW SCUPPER; OVERFLOW SCUPPER; EDGE SCUPPER; DOWNSPOUT/ COLLECTOR HEAD; DOWNSPOUT; RISE WALL METAL PANEL; PARAPET; EXPANSION JOINT AT PARAPET; SLOPE DIRECTION; SKYLIGHT

ARMKO INDUSTRIES, INC.
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1320 Spinks Road
Flower Mound, TX 75028
(972)874-1388

STATE OF TEXAS — DEAN D. BROWN — 117508 — LICENSED PROFESSIONAL ENGINEER

02/01/19

ISSUES

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PARTIAL ROOF REPLACEMENTS OF SUMMER 2019
McMATH MIDDLE SCHOOL
1900 JASON DRIVE
DENTON, TX 76205

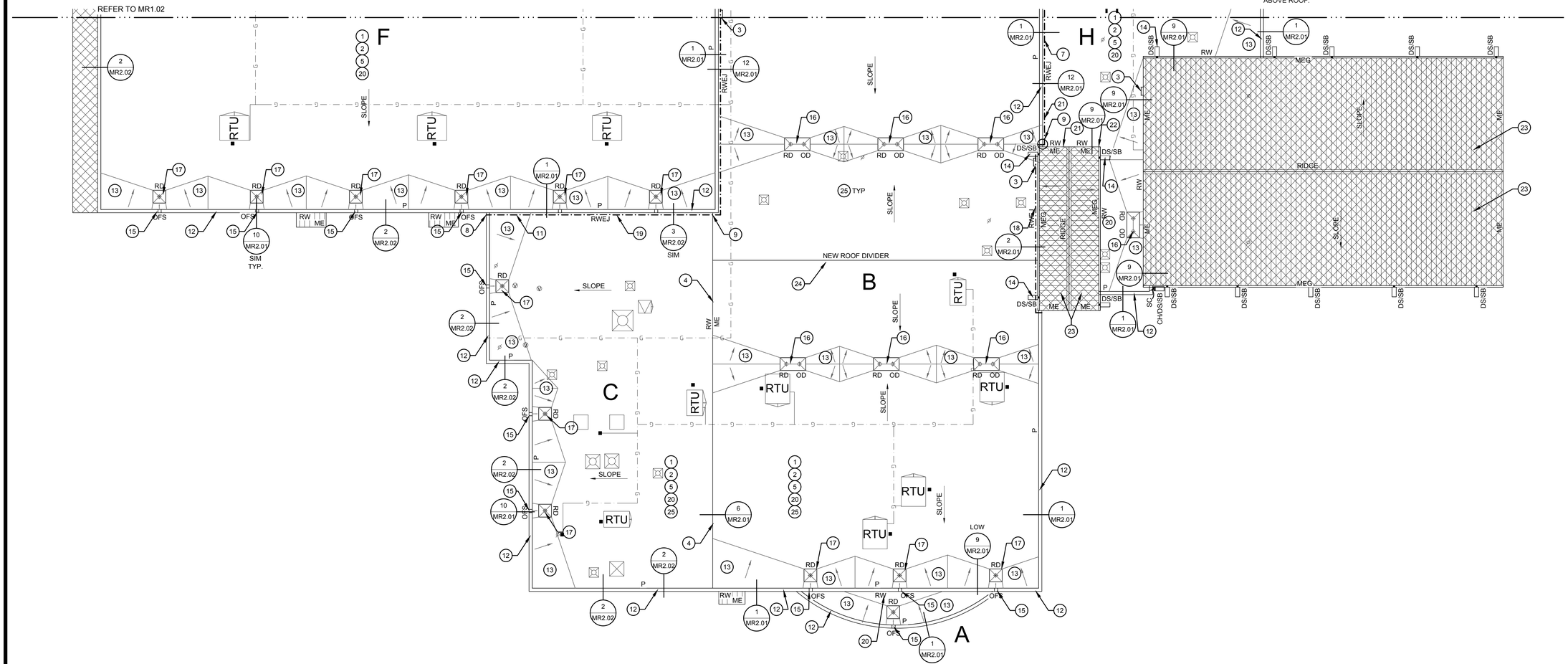
ENLARGED ROOF PLAN AND SPECIFIC NOTES

JOB 19-1010-56
DATE 02.01.19
DRAWN BY: JW
SHEET

MR1.02

SPECIFIC ROOF NOTES

1. REMOVE EXISTING ROOF DOWN TO EXISTING ROOF DECK AND PREPARE EXISTING SUBSTRATE TO RECEIVE NEW ROOF SYSTEM.
2. PROVIDE NEW ROOF SYSTEM PER DETAIL.
3. PAINT EXISTING ROOF TO ROOF LADDER AND PROVIDE ADDITIONAL WALK PAD AT ACCESSIBLE POINTS.
4. PROVIDE PREFINISHED METAL EDGE FLASHING.
5. PROVIDE NEW ROLLER SUPPORTS FOR EXISTING PIPING AND CONDUIT ABOVE ROOF.
6. PROVIDE TAPERED INSULATION TO PROVIDE POSITIVE DRAINAGE TOWARDS ROOF DRAINS 1/4" PER FOOT SLOPE.
7. PROVIDE ROOF TO RISE WALL EXPANSION JOINT FLASHING.
8. EXTEND EXPANSION JOINT THROUGH THE PARAPET AND FLASH WATERTIGHT. COVER WITH METAL FLASHING.
9. TRANSITION THE ROOF TO PARAPET EXPANSION JOINT DOWN TO ROOF TO ROOF EXPANSION JOINT.
10. PROVIDE ROOF TO ROOF EXPANSION JOINT.
11. TAPER THE TOP OF THE EXPANSION JOINT AS REQUIRED TO MAINTAIN 8" MINIMUM HEIGHT ABOVE FINISHED ROOF SURFACE.
12. REMOVE AND REPLACE EXISTING METAL COPING WITH NEW PREFINISHED METAL COPING. ADD NAILERS AS REQUIRED TO MAINTAIN 8" HEIGHT ABOVE ROOF.
13. PROVIDE 1/2" PER FOOT TAPERED CRICKETS.
14. PROVIDE CONCRETE SPLASH BLOCK.
15. RE-WORK EXISTING OVERFLOW SCUPPER AS REQUIRED TO MAINTAIN 2" HEIGHT ABOVE NEW ROOF SURFACE. INCREASE SCUPPER OUTLET TO BE 8X12.
16. ENLARGE ROOF DRAIN SUMPS TO BE 8"-0" X 12'-0".
17. ENLARGE ROOF DRAIN SUMPS TO BE 8"-0" X 8'-0".
18. TIE NEW COPING / COUNTER FLASHING INTO THE EXISTING VERTICAL FLASHING AT THE RISE WALL ABOVE THE COPING LINE.
19. PROVIDE ROOF TO ROOF PARAPET EXPANSION JOINT.
20. CONTRACTOR TO REMOVE AND REPLACE ALL ROOF DRAIN STRAINERS WITH THE NEW 19" DIAMETER OVERSIZED CAST IRON DRAIN STRAINER AND NEW DRAIN BOLTS.
21. PROVIDE PREFINISHED FLUSH TYPE METAL WALL PANELS ON SELF-ADHERING MEMBRANE ON 3/4" EXTERIOR GRADE PLYWOOD ON 7/8" HAT CHANNELS AT 16" O.C. VERTICAL CONTINUOUS HORIZONTAL WITH MISCELLANEOUS TRIM.
22. PROVIDE PREFINISHED METAL CLOSURE TRIM WHERE METAL WALL PANELS TERMINATE.
23. REMOVE AND REPLACE EXISTING VENT STACK BOOTS WHERE THEY OCCUR AND INSTALL NEW FLEXIBLE BOOTS, SIZE, AND STYLE TO MATCH EXISTING. COLOR TO MATCH PANEL.
24. PROVIDE NEW ROOF DIVIDER IN THE EXISTING ROOF SYSTEM. LOCATE AS DIRECTED BY ARCHITECT.
25. REMOVE AND REPLACE EXTERIOR SEALANT AND BACKER ROD AT ALL VERTICAL WALL JOINTS ABOVE ROOF.



NORTH

ENLARGED ROOF PLANS - McMATH MIDDLE SCHOOL
NOT TO SCALE

ROOF LEGEND

ROOF SYSTEM

NOT IN CONTRACT

ROOF ACCESS LADDER
SATELLITE DISH
ROOF HATCH
ANTENNA
SECURITY CAMERA
SOIL/PLUMBING VENT
PITCH PAN
FLANGE MOUNTED EQUIPMENT
PROCESS VENT STACK
HOT STACK
VENT STACK
CURB MOUNTED VENT
FLANGE MOUNTED VENT
ROOF TOP UNIT
PLENUM RTU ON PITCH PANS
CURB MOUNTED EQUIPMENT
MISCELLANEOUS EQUIPMENT
MISCELLANEOUS EQUIPMENT ON PP
SC THROUGH WALL SCUPPER
PRIMARY ROOF DRAIN
NOS NEW OVERFLOW SCUPPER
OVERFLOW ROOF DRAIN
OFS OVERFLOW SCUPPER
PRIMARY AND OVERFLOW ROOF DRAIN
SC EDGE SCUPPER
DS/SB DOWNSPOUT/ SPLASHBLOCK
DS/CH DOWNSPOUT/ COLLECTOR HEAD
EJ EXPANSION JOINT
DS DOWNSPOUT
ME/G METAL EDGE W/GUTTER
RW RISE WALL METAL PANEL
ME METAL EDGE
P PARAPET
RW RISE WALL
P/EJ EXPANSION JOINT AT PARAPET
RME RAISED METAL EDGE
SLOPE DIRECTION
RW/EJ RISE WALL W/EXPANSION JOINT
SL SKYLIGHT

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ISSUES

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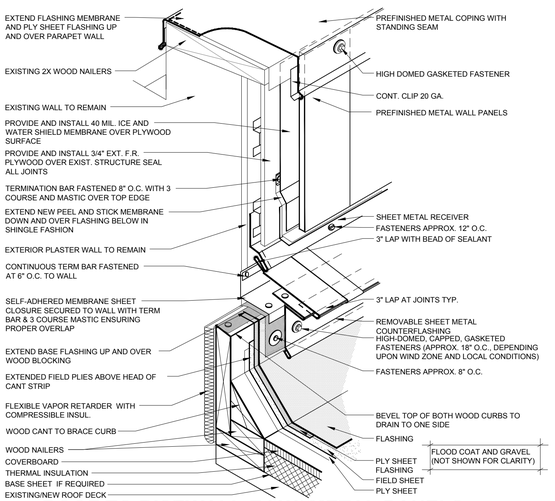
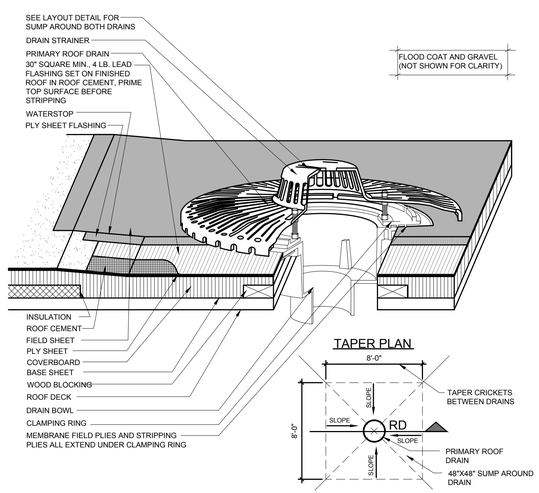
ENLARGED ROOF PLAN AND SPECIFIC NOTES

JOB 19-1010-56
DATE 02.01.19
DRAWN BY: JW
SHEET

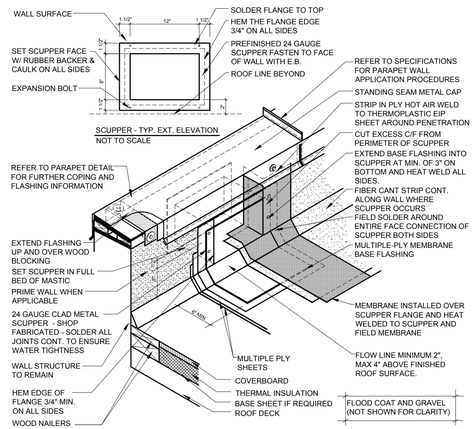
MR1.03



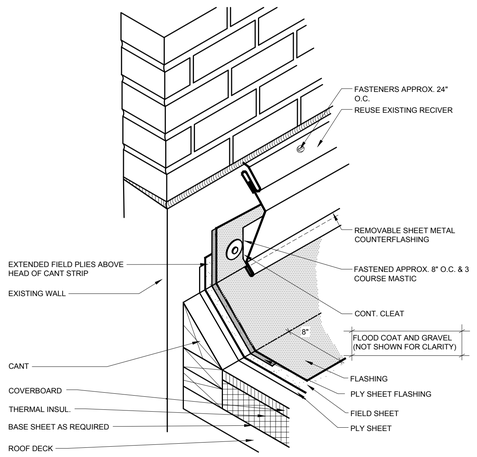
12 ROOF TO RISEWALL EJ W/ METAL PANELS
NOT TO SCALE



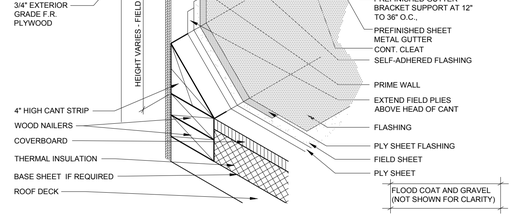
11 MAIN ROOF DRAIN
NOT TO SCALE



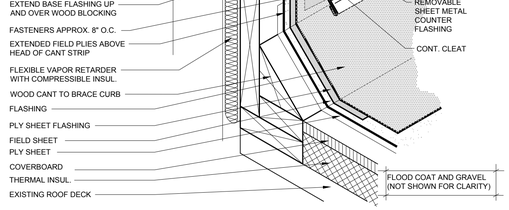
10 THROUGH WALL OVERFLOW SCUPPER / ENLARGE EXISTING
NOT TO SCALE



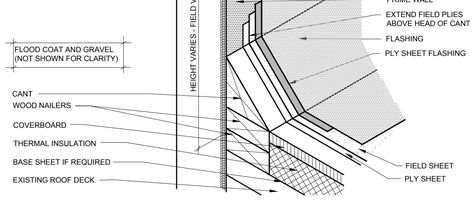
9 ROOF TO RISEWALL REUSE EXISTING RECEIVER
NOT TO SCALE



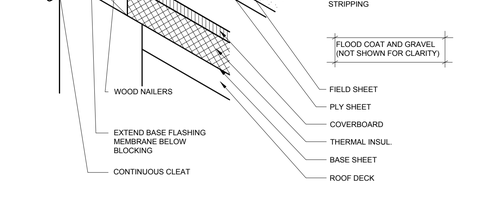
8 ROOF TO ROOF OFFSET WITH GUTTER
NOT TO SCALE



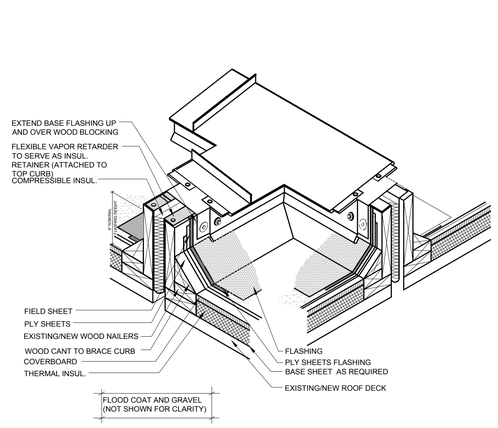
7 ROOF TO ROOF OFFSET W/ EXPANSION JOINT
NOT TO SCALE



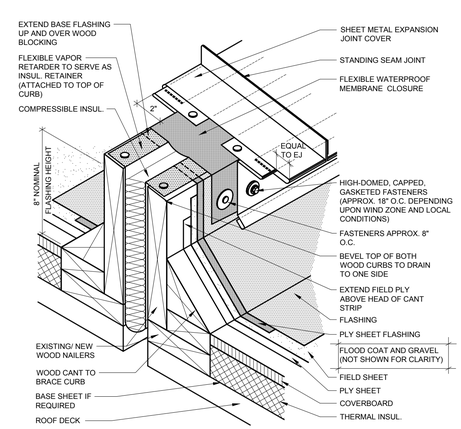
6 ROOF TO ROOF OFFSET
NOT TO SCALE



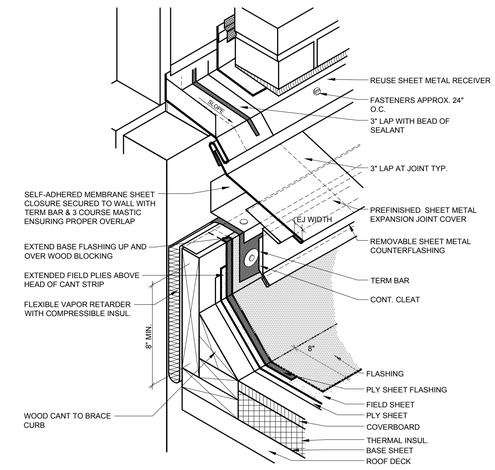
5 METAL EDGE
NOT TO SCALE



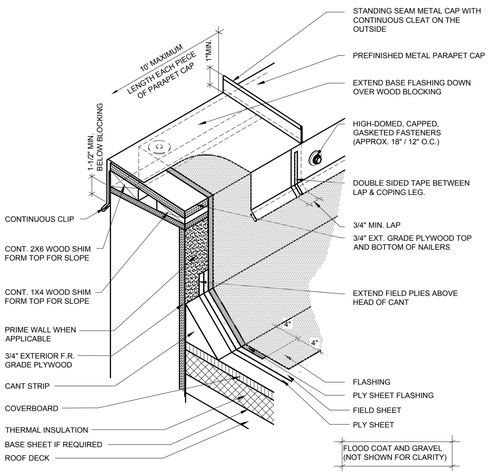
4 ROOF EXPANSION JOINT "T" INTERSECTION
NOT TO SCALE



3 FIELD EXPANSION JOINT
NOT TO SCALE



2 ROOF TO RISEWALL W/ EJ - REUSE RECEIVER
NOT TO SCALE



1 LOW PARAPET
NOT TO SCALE

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STATE OF TEXAS
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117908
LICENSED PROFESSIONAL ENGINEER
02/01/19

ISSUES

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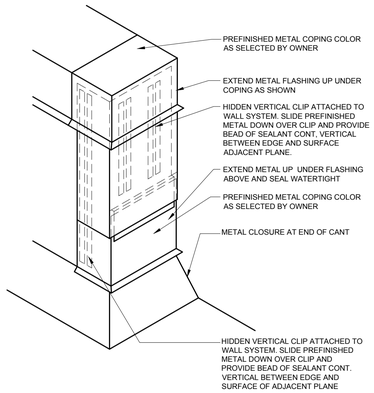
1900 JASON DRIVE
DENTON, TX 76205

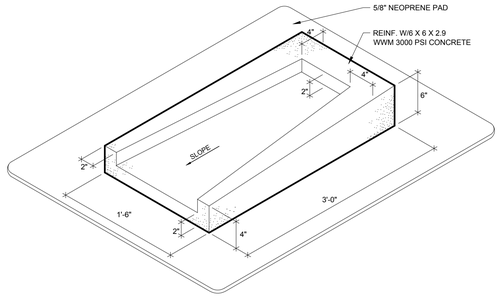
ROOF DETAILS

JOB 19-1010-56
DATE 02.01.19
DRAWN BY: JW
SHEET

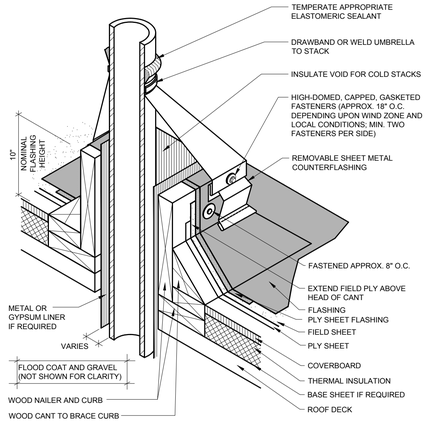
MR2.01



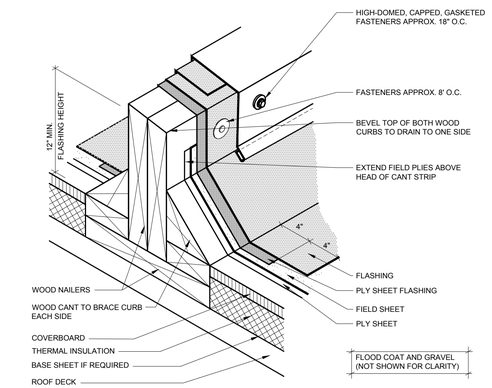
11 PARAPET END TERMINATION
NOT TO SCALE



10 SPLASH BLOCK
NOT TO SCALE



9 HOT STACK
NOT TO SCALE



8 EQUIPMENT CURB
NOT TO SCALE

7 VENT STACK
NOT TO SCALE

6 ROOF EXPANSION JOINT "4 WAY" INTERSECTION
NOT TO SCALE

5 ROOF TO RISEWALL @ EXISTING PLASTER
NOT TO SCALE

4 ROOF TO ROOF PARAPET
NOT TO SCALE

3 TALL PARAPET
NOT TO SCALE

2 TALL PARAPET
NOT TO SCALE

1 PRIMARY AND SECONDARY DRAINS WITH TAPER PLAN
NOT TO SCALE

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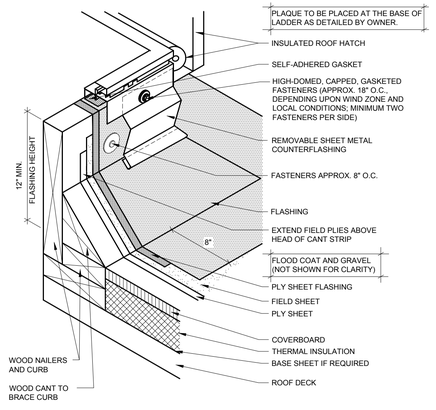
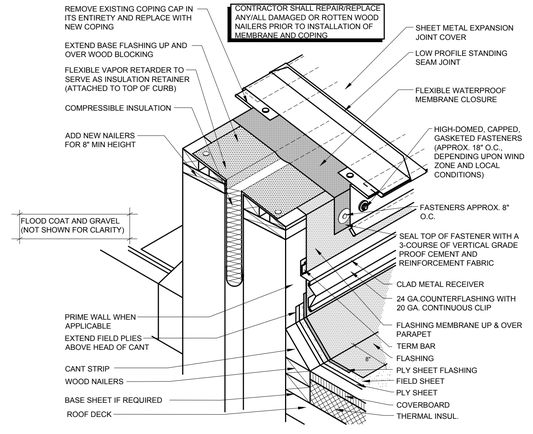


2 ROOF HATCH
NOT TO SCALE



1 ROOF TO ROOF EJ
NOT TO SCALE

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MR2.03