ENGINEERS

PLANS AND SPECIFICATIONS

FOR

US Army Corps of Engineers®

NATIONAL ROOFING PROGRAM (NRP)
FY19 PROJECT, LA012
US ARMY RESERVE CENTER
LAFAYETTE, LOUISIANA

JULY 17, 2020

REI PROJECT NO. 19CHS-061

PROJECT TABLE OF CONTENTS

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SECTION 01 11 50

SUMMARY OF WORK
08/15

PART 1 GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of the Contract and Specification Sections apply to this Section.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. Work Includes

This work includes the provision of all labor, material, equipment, supervision and administration to integrate the work outlined in this project manual into the total building system such that no leakage into the system occurs.

B. Project Description

1. USARC (MB)

Areas A, C: Remove and dispose of the existing retrofit metal roof system including zee purlins, flashings and sheet metal down to the existing gypsum deck; repair any damaged decking; resecure existing nailers to remain in place; install new wood nailers; mechanically attach base sheet; install specified insulation system, coverboard and modified bitumen base ply and base ply flashings in hot asphalt; torch apply modified bitumen cap sheet and cap ply flashings; install all accessories, new gutters, downspouts and splash blocks and provide new sheet metal flashings and trim to provide a complete roof assembly in compliance with the plans and specifications.

Area B: Remove and dispose of the existing retrofit metal roof system including zee purlins, flashings and sheet metal down to the existing concrete deck; resecure existing nailers to remain in place; install new wood nailers; prime concrete decking and install specified vapor barrier, specified insulation system, coverboard, modified bitumen base ply and base ply flashings in hot asphalt; torch apply modified bitumen cap sheet and cap ply flashings; install all accessories, new gutters, downspouts and splash blocks and provide new sheet metal flashings and trim to provide a complete roof assembly in compliance with the plans and specifications.

Area D: Remove and dispose of existing modified bitumen roof system including insulation, flashings and sheet metal down to exisitng metal roof "R" panels; install custom cut flute-fill insulation over existing metal roof panels; mechanically attach coverboard insulation; install mechanically attached, induction welded thermoplastic single-ply PVC membrane; install all accessories, new

gutters, downspouts and splash blocks and provide new sheet metal flashings and trim to provide a complete roof assembly in compliance with the plans and specifications.

Area E: Remove and dispose of the existing roof system including flashings and sheet metal down to the existing metal deck; repair any damaged decking; resecure existing nailers to remain in place; mechanically attach base layer of insulation; install remainder of specified insulation, coverboard and modified bitumen base ply and base ply flashings in hot asphalt; torch apply modified bitumen cap sheet and cap ply flashings; install all accessories and provide new sheet metal flashings and trim to provide a complete roof assembly in compliance with the plans and specifications.

2. OMS (MB)

Areas F, G: Remove and dispose of the existing roof system including flashings and sheet metal down to the existing gypsum and plywood deck; repair any damaged decking; resecure existing nailers to remain in place; mechanically attach base layer of insulation; install remainder of specified insulation, coverboard and modified bitumen base ply and base ply flashings in hot asphalt; torch apply modified bitumen cap sheet and cap ply flashings; install all accessories and provide new sheet metal flashings and trim to provide a complete roof assembly in compliance with the plans and specifications.

Install new ladder brackets on exterior wall where shown.

C. Location

The work is located at the 1640 LA 728-8, Lafayette, LA 70508, approximately as indicated on drawings.

1.03 OCCUPANCY OF PREMISES

Building(s) will be occupied during performance of work under this Contract. Contractor to minimize interruption of existing operations during construction.

Before work is started, arrange with the Contracting Officer a sequence of procedure, means of access, space for storage of materials and equipment.

1.04 EXISTING WORK

In addition to FAR 52.236-9 Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements:

a. Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain.

b. Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work must be in a condition

equal to or better than that which existed before new work started.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 14 00

WORK RESTRICTIONS
11/11

PART 1 GENERAL

1.01 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 50 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

List of Contact Personnel; G,

1.02 CONTRACTOR ACCESS AND USE OF PREMISES

A. Activity Regulations

Ensure that Contractor personnel employed on the Activity become familiar with and obey Activity regulations including safety, fire, traffic and security regulations. Keep within the limits of the work and avenues of ingress and egress. Wear hard hats in designated areas. Do not enter any restricted areas unless required to do so and until cleared for such entry. Mark Contractor equipment for identification.

1. Subcontractors and Personnel Contacts

Provide a list of contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

2. Tobacco Products

A. Tobacco use (to include cigarettes, cigars, cigarillos, smokeless tobacco and/or electronic cigarettes, inhaled tobacco, and all other tobacco products designed for human consumption)is prohibited in all DA-occupied workplaces except for designated smoking areas. The workplace includes any area inside a building or facility over which DA has custody and control, and where work is performed by military personnel, civilians, or persons under contract to the Army.

B. Use of Site

Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.

1. Limits: Confine constructions operations to areas of work

being renovated as approved by Engineer and Owner.

2. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to User, User's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

   a. Schedule deliveries to minimize use of driveways and entrances.
   b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

3. Move any stored materials and equipment that interfere with operations of the User.

C. Use of Existing Building

Maintain existing building in a weathertight condition throughout construction period.

Protect building, its contents, and its occupants during construction period.

The Contractor shall not overload or permit any part of the structure to be loaded with such weights as will endanger its safety or to cause excessive deflection. Materials placed on the roof prior to installation shall be equally distributed over the roof area.

Protect any existing surface improvements, such as pavements, curbs, sidewalks, lawn and landscaped areas, utilities, etc.

Repair to the User's and Engineer's satisfaction, or to restore to a condition equal to that existing at the time of award of Contract, or to make restitution acceptable to the Owner, any and all damages to the building, its contents, or surface improvements resulting from, or attributable to, the work operation.

D. Working Hours

Work hours shall generally be performed during normal business hours.

E. Work Outside Regular Hours

Work outside regular working hours requires Contracting Officer approval, and may not be approved. Make application 15 calendar days prior to such work to allow arrangements to be made by the Government for inspecting the work in progress, giving the specific dates, hours, location, type of work to be performed, contract number and project title. Based on the justification provided, the Contracting Officer may approve work outside regular hours. Make utility cutovers after normal working hours or on Saturdays, Sundays, and Government holidays unless directed otherwise.

F. Occupied Buildings

The Contractor shall be working on existing buildings which are occupied. Do not enter the buildings without prior approval of the Contracting Officer.

The existing buildings and their contents must be kept secure at all times. Provide temporary closures as required to maintain security as directed by the Contracting Officer.

G. Utility Cutovers and Interruptions

a. Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays, and Government holidays. Conform to procedures required in paragraph WORK OUTSIDE REGULAR HOURS.

b. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.

c. Interruption to water, sanitary sewer, storm sewer, telephone service, electric service, air conditioning, heating, fire alarm, andcompressed air, are considered utility cutovers pursuant to the paragraph WORK OUTSIDE REGULAR HOURS.

1.03 SECURITY REQUIREMENTS

Contractor shall be required to follow all security procedures set forth by the Owner, including scheduling requirement, limited use of electronic and photographic equipment, etc.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 33 50

SUBMITTAL PROCEDURES
06/18

PART 1 GENERAL

This is a MILCON Design/Bid/Build Project.

1.01 DEFINITIONS

A. Submittal

Contract Clauses FAR 52.236-5, Material and Workmanship, paragraph (b) and FAR 52.236-21, Specifications and Drawings for Construction, paragraphs (d), (e), (f), and Alternate I apply to all submittals.

B. Submittal Descriptions (SD)

Submittal requirements are specified in the technical sections. Submittals required are identified by SD numbers and titles as follows:

SD-01 Preconstruction Submittals

A document, required of the Contractor, or through the Contractor, from a supplier, installer, manufacturer, or other lower tier Contractor, the purpose of which is to confirm the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verifications of quality.

SD-02 Shop Drawings

Submittals which graphically show relationship of various components of the work, schematic diagrams of systems, details of fabrication, layouts of particular elements, connections, and other relational aspects of the work.

SD-03 Product Data

Preprinted manufacturer material describing a product, system, or material, such as catalog cuts.

SD-04 Samples

Samples, including both fabricated and un-fabricated physical examples of materials, products, and units of work as complete units or as portions of units of work.

SD-05 Design Data

Submittals, which provide calculations, descriptions, or

documentation regarding the work.

SD-06 Test Reports

Reports of inspections or tests, including analysis and interpretation of test results.

SD-07 Certificates

Statement signed by an official authorized to certify on behalf of the manufacturer of a product, system or material, attesting that the product, system or material meets specified requirements. The statement must be dated after the award of the contract, must state the Contractor's name and address, must name the project and location, and must list the specific requirements, which are being certified.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material; including special notices and material safety data sheets, if any, concerning impedances, hazards, and safety precautions.

SD-09 Manufacturer's Field Reports

Daily reports from specially suppliers to the contractor that provide information, data, tests result for a product.

SD-10 Operation and Maintenance Data

Data, which forms a part of an operation and maintenance manual.

SD-11 Closeout Submittals

All data, documentation, information, and drawings to achieve contract closeout.

C. Approving/Acceptance Authority

Office or designated person authorized to approve/accept the submittal.

D. Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.02 SUBMITTALS

Government approval/acceptance is required for submittals with a "G" designation; submittals not having a "G" designation are for information only (FIO) or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with LRL Section 01 33 50 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Submittal register; G, RO

Quality control planG

Accident prevention plan (app)G

Environmental protection planG

1.03 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

A. Government Approved/Accepted (G)

All submittals classified for Government Approval/Acceptance (G) are identified in the approved submittal register Form 4288. A code following the "G" designation indicates the action authority; "no code" or code of "RO" for Resident Engineer Office action, code of "DO" for District Office action, and a code of "AE" for Architect-Engineer or Engineering Division Designer of Record action.

1. Government Approved

Government approval is required for all specification submittal items found in specifications having structural steel connections, extensions of design, Fire Protection/Life Safety, and Commissioning of HVAC, and other items as designated by the Contracting Officer. Government approval (G) is also required for all submittals designated as such in the technical specifications. Within the terms of Section CONDITIONS of the CONTRACT, paragraph "Specifications and Drawings for Construction," they are considered to be "shop drawings". The Government will review all submittals designated as deviating from the Solicitation, as described below.

2. Government Accepted

Government acceptance applies to the Quality Control Plan, the Accident Prevention Plan, and the Drug Free Workplace Certification. These submittals are within the terms of Section CONDITIONS of the CONTRACT entitled "Inspection of Construction", "Accident Prevention", and "Drug Free Workplace" respectively. The Government will review all submittals designated as deviating from the Solicitation or Accepted Proposal, as described below.

B. Information Only

All Contractor submittals not requiring Government approval/acceptance will be for information only. FIO submittals are identified in the approved submittal register Form 4288. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above. FIO Submittals will be retained at the project site and reviewed prior to Preparatory

Meetings.

1.04 ELECTRONIC FILE FORMAT

Provide submittals other than material samples in electronic format. Electronic format shall be in Adobe.PDF format, unless otherwise specified or directed by the Contracting Officer's Representative (COR). The electronic submittal file must be compiled as a single, complete document. The electronic submittal file must be named specifically according to its contents (e.g. 01 45 04.10 06 Quality Control Plan.pdf). Scanned files must be of sufficient quality that all information is legible. When required, the electronic file must include a valid electronic signature, or scan of a signature.

All submittals and supporting documents to be submitted through RMS. If file size exceeds capabilities of RMS, contractor shall provide through an electronic file sharing system such as the DOD SAFE Web Application located at the following website:

https://safe.apps.mil/

1.05 APPROVED/ACCEPTED SUBMITTALS

The Contracting Officer's approval/acceptance of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval/acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved/accepted by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.06 DISAPPROVED/NON-ACCEPTED

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with FAR 52.243-4 - Changes shall be given promptly to the Contracting Officer.

1.07 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals/non-acceptance have not been obtained.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SUBMITTAL REGISTER

At the end of LRL Section 00 80 00.00 06, SPECIAL PROVISIONS, is a submittal register showing items for which submittals are required by

the specifications; this list may not be all inclusive and additional submittals may be required. The Contractor shall maintain a submittal register for the project .

A. All Submittals Which Exceed the Detail Shown on the Contract Drawings

1. Submittal's Electronic Format

LRL Section 00 80 00.00 06, SPECIAL PROVISIONS, Paragraph "As-Built Drawings", also require submittal details or drawings which exceed that which is shown on the contract drawings to be transmitted in electronic format. All such submittals must include, along with the hard copy of the drawings required above, CADD files of the submittal in the Using Agency's CAD format, for incorporating into as-built or record drawings. These submittals include those that reflect structural details, foundation layouts, equipment, sizes, mechanical room layouts, and other similar data, including all extensions of design, which were not shown or have changed from the original drawings.

3.02 REAL PROPERTY RECORD, DD FORM 1354

The Contractor shall promptly furnish and shall cause any sub-contractor or supplier to furnish, in like manner, unit prices and descriptive data required by the Government for Property Record purposes of fixtures and equipment furnished and/or installed by the Contractor or sub-contractor, expected prices do not need to be provided for Government-Furnished Property. Current version of DD1354 shall be used. Reference UFC 1-300-08 and attached example DD Form 1354.

3.03 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 30 calendar days exclusive of mailing time, shall be allowed and shown on the submittal register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

3.04 TRANSMITTAL FORM (ENG FORM 4025)

The transmittal form (ENG Form 4025)shall be used for submitting both Government approved/acceptance and information only submittals in accordance with the instructions on the reverse side of the form. Form 4025 will either be furnished to the Contractor or included in the QCS software that the Contractor is required to use for this contract. Form 4025 shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

3.05 SUBMITTAL PROCEDURE

Submittals shall be made as follows:

A. Procedures

The Contractor shall submit to the Contracting Officer four (4) copies of all submittals of items requiring shop inspection and two (2) copies of all other submittals as called for under the various headings of these specifications

B. Deviations

For submittals which include proposed deviations requested by the Contractor, the "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

3.06 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

3.07 GOVERNMENT CONFORMANCE REVIEW

If the Government performs a conformance review of other Designer of Record approved submittals, the submittals will be so identified and returned, as described above. Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. One copy of the submittal will be retained by the Contracting Officer and two copies of the submittal will be returned to the Contractor

3.08 INFORMATION ONLY SUBMITTALS

The Contractor is responsible for preparing and retaining two copies of all FIO submittals in a pair of "Government" files at the Contractor's field office. One copy of the FIO submittals will be used for historical record and transferred to the customer upon completion of the project. The second copy will be used for Quality Assurance reviews, but may be retained at the Government's field office at the discretion of the Quality Assurance Representative. Both files shall be maintained in good order and filed by specification section.

A minimum of 30 days in advance of the Approval Needed By date (Submittal Register, ENG Form 4288, Contractor Schedule Dates, Item "t") the Contractor shall submit only the transmittal form (ENG Form 4025-R) to the Government. The required submittal information shall be complete and available for review at the Contractor's field office. Government personnel will perform discretionary Quality Assurance reviews of the submittals as necessary to satisfy the Government that the Contractor's Quality Control system is providing the specified level of quality. Submittals that contain both Government Approval

and Information Only items shall be processed as Government Approved Submittals. Submittals that do not meet the contract requirements will be assigned an "FX" action code by the Contracting Officer, and the submittal deficiencies will be forwarded to the Contractor. The Contractor shall resubmit for Government Approval and in accordance with Paragraph "Disapproved Submittals"

Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
LA012

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)		(q)	(r)
		01 14 00	SD-01 Preconstruction Submittals																
			List of Contact Personnel	1.02 A.1.	G														
		01 33 50	SD-01 Preconstruction Submittals																
			Submittal register		G	RO													
			Quality control plan																
			Accident prevention plan (app)																
			Environmental protection plan																
		01 50 00	SD-01 Preconstruction Submittals																
			Construction Site Plan	1.05	G	LRL													
			Existing Condition Assessment	1.07 A.															
		06 10 00	SD-02 Shop Drawings																
			Modifications of Structural		G														
			Members																
			SD-06 Test Reports																
			Preservative-treated	1.04 C.															
			SD-07 Certificates																
			Certificates of Grade	1.07 A.															
			Preservative Treatment	1.06															
			SD-10 Operation and Maintenance																
			Data																
			Take-back Program																
		07 01 50	SD-03 Product Data																
			Soil Pipe Extensions	2.01 D.	G														
			Galvanized Steel Plates	2.01 C.	G														
			Roof Deck	2.01 B.1.	G														
			Roof Deck Fasteners	2.01 B.2.	G														

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		07 01 50	Deck Repair Coating	2.01 B.3.	G													
			Roof Drains	2.01 E.	G													
			Condensate Pipe Support	2.01 F.														
			Gas Line Support	2.01 G.														
			Poured Gypsum	2.01 A.														
		07 52 00.00 48	SD-02 Shop Drawings															
			Roof Plan	1.5.6														
			SD-03 Product Data															
			Pre-Manufactured Accessories	2.9	G													
			Base Sheet Materials	2.3	G													
			Membrane Materials	2.4	G													
			Fluid Applied Flashing System	2.5	G													
			Bituminous Materials	2.6	G													
			Insulation / Board Goods	2.7	G													
			Fasteners	2.8	G													
			SD-05 Design Data															
			Wind Uplift Calculations	1.5.5	G													
			SD-06 Test Reports															
			Samples of Built-Up Roofing		G													
			SD-07 Certificates															
			Qualification of	1.5.1	G													
			Applicator/Installer															
			Qualification of Manufacturer	1.5.2	G													
			Qualification of Engineer of	1.5.3	G													
			Record															
			Insulation Certificate		G													

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		07 52 00.00 48	Wind Uplift Resistance	1.5.5	G														
			Fire Resistance	1.5.4	G														
			SD-08 Manufacturer's Instructions																
			Installation Instructions:		G														
			Base Flashing Instructions:		G														
			Cold Weather Installation	1.7	G														
			SD-11 Closeout Submittals																
			WARRANTY	1.10	G														
			INSPECTION REPORT																
		07 54 19	SD-02 Shop Drawings																
			Detail Drawings	1.06	G														
			Roof Plan	1.06	G														
			SD-03 Product Data																
			PVC Roofing Membrane	3.03 B.	G														
			Energy Star Label for roof membrane	2.01 B.	S														
			Bonding Adhesive	2.01 D.															
			Flashing	1.05 C.															
			Flashing	3.03 B.2.															
			Membrane Fasteners and Plates	2.01 G.															
			Roof Insulation	2.01 J.															
			Pre-Manufactured Accessories	2.01 H.															
			Water Cutoffs	3.06 A.															
			Information Card	2.01 A.															
			SD-05 Design Data																
			Wind Uplift Resistance	1.03 B.	G														

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		07 54 19	SD-07 Certificates																
			Qualification of Manufacturer	1.05 A.															
			Qualifications of Applicator	1.05 B.															
			Qualification of Engineer of Record																
			Wind Uplift Resistance	1.03 B.															
			Fire Resistance	1.03 A.															
			Minimum Polymer Thickness	2.01 A.															
			Minimum Polymer Thickness	2.01 F.															
			Sample	1.10	G														
			SD-08 Manufacturer's Instructions																
			Application Method	3.03	G														
			Membrane Flashing	2.01 F.	G														
			Membrane Flashing	3.04 B.	G														
			Perimeter Attachment	3.03 D.															
			Auxiliary Fasteners	2.01 G.2.															
			Protection Mat																
			Pre-Manufactured Accessories	2.01 H.															
			Cold Weather	1.08	G														
			SD-11 Closeout Submittals																
			Warranty	1.10	G														
			Information Card	2.01 A.	G														
			Instructions to Government Personnel	3.09	G														
		07 62 00.00 48	SD-02 Shop Drawings																
			Gutters		G														

CERTIFIED FINAL

SUBMITTAL REGISTER

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LA012

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)		(q)	(r)
		07 62 00.00 48	Downspouts		G														
			Gravel stops and fascias		G														
			Splash pans		G														
			Flashing for roof drains		G														
			Base flashing		G														
			Counterflashing		G														
			Flashing at roof penetrations		G														
			Reglets		G														
			Scuppers		G														
			Copings		G														
			Edge Metal		G														
			Conductor heads																
			SD-03 Product Data																
			Lead Sheet	2.1.3	G														
			Aluminum-Zinc (Galvalume)	2.1.4	G														
			Alloy-Coated Steel Sheet																
			Stainless Steel	2.1.6	G														
			Elastomeric Joint Sealants	2.1.9	G														
			Solder	2.1.8	G														
			Aluminum Alloy	2.1.7	G														
			Self-Adhering Membrane	2.1.10	G														
			Asphalt Roofing Cement	2.1.11	G														
			Fasteners	2.1.14	G														
			Roofing Felt	2.1.12	G														
			Asphalt Primer	2.1.13	G														
			SD-07 Certificates																

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
LA012

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)		(q)	(r)
		07 62 00.00 48	Manufacturer Certificates																
			SD-11 Closeout Submittals																
			Quality Control Plan	3.14															

CERTIFIED FINAL

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS
02/19

PART 1 GENERAL

1.01 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization (e.g. ASTM B564 Standard Specification for Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.02 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
1899 L Street, NW,11th Floor
Washington, DC 20036
Ph: 202-293-8020
Fax: 202-293-9287
E-mail: storemanager@ansi.org
Internet: https://www.ansi.org/

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)
1801 Alexander Bell Drive
Reston, VA 20191
Ph: 800-548-2723; 703-295-6300
Internet: https://www.asce.org/

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)
520 N. Northwest Highway
Park Ridge, IL 60068
Ph: 847-699-2929
E-mail: customerservice@assp.org
Internet: https://www.assp.org/

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)
P.O. Box 361784
Birmingham, AL 35236-1784
Ph: 205-733-4077
Fax: 205-733-4075
Internet: http://www.awpa.com

APA - THE ENGINEERED WOOD ASSOCIATION (APA)
7011 South 19th St.

Tacoma, WA 98466-5333
Ph: 253-565-6600
Fax: 253-565-7265
Internet: https://www.apawood.org/

ASPHALT ROOFING MANUFACTURER'S ASSOCIATION (ARMA)
750 National Press Building
529 14th Street, NW
Washington, DC 20045
Ph: 202-591-2450
Fax: 202-591-2445
Internet: https://asphaltroofing.org/

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9500
Fax: 610-832-9555
E-mail: service@astm.org
Internet: https://www.astm.org/

FM GLOBAL (FM)
270 Central Avenue
Johnston, RI 02919-4949
Ph: 401-275-3000
Fax: 401-275-3029
Internet: https://www.fmglobal.com/

INTERNATIONAL CODE COUNCIL (ICC)
500 New Jersey Avenue, NW
6th Floor, Washington, DC 20001
Ph: 800-786-4452 or 888-422-7233
Fax: 202-783-2348
E-mail: order@iccsafe.org
Internet: https://www.iccsafe.org/

METAL BUILDING MANUFACTURERS ASSOCIATION (MBMA)
1300 Sumner Avenue
Cleveland, OH 44115-2851
Ph: 216-241-7333
Fax: 216-241-0105
Internet: https://www.mbma.com/

MIDWEST ROOFING CONTRACTORS ASSOCIATION (MRCA)
2077 Embury Park Road
Dayton, OH 45414
Ph: 800-497-6722
Fax: 937-278-0317
E-mail: info@mrca.org
Internet: General Information: http://www.mrca.org

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 800-344-3555
Fax: 800-593-6372
Internet: https://www.nfpa.org

NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
10255 West Higgins Road, Suite 600
Rosemont, IL 60018-5607
Ph: 847-299-9070
Fax: 847-299-1183
Internet: http://www.nrca.net

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
4201 Lafayette Center Drive
Chantilly, VA 20151-1219
Ph: 703-803-2980
Fax: 703-803-3732
Internet: https://www.smacna.org/

U.S. ARMY CORPS OF ENGINEERS (USACE)
CRD-C DOCUMENTS available on Internet:
http://www.wbdg.org/ffc/army-coe/standards
Order Other Documents from:
Official Publications of the Headquarters, USACE
E-mail: hqpublications@usace.army.mil
Internet: http://www.publications.usace.army.mil/
or
https://www.hnc.usace.army.mil/Missions/Engineering-Directorate/TECHINFO/

U.S. DEPARTMENT OF ENERGY (DOE)
1000 Independence Avenue Southwest
Washington, D.C. 20585
Ph: 202-586-5000
Fax: 202-586-4403
E-mail: The.Secretary@hq.doe.gov
Internet: https://www.energy.gov/

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Internet: https://www.archives.gov/
Order documents from:
Superintendent of Documents
U.S. Government Publishing Office (GPO)
732 N. Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800 or 866-512-1800
Bookstore: 202-512-0132
Internet: https://www.gpo.gov/

UNDERWRITERS LABORATORIES (UL)
2600 N.W. Lake Road
Camas, WA 98607-8542
Ph: 877-854-3577 or 360-817-5500
E-mail: CustomerExperienceCenter@ul.com
Internet: https://www.ul.com/
UL Directories available through IHS at https://ihsmarkit.com/

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-- End of Section --

SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
05/18

PART 1 GENERAL

1.01 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referred to within the text by the basic designation only.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2017; ERTA 1-2 2017; TIA 17-1; TIA 17-2; TIA 17-3; TIA 17-4; TIA 17-5; TIA 17-6; TIA 17-7; TIA 17-8; TIA 17-9; TIA 17-10; TIA 17-11; TIA 17-12; TIA 17-13; TIA 17-14; TIA 17-15; TIA 17-16; TIA 17-17) National Electrical Code
NFPA 241	(2013; Errata 2015) Standard for Safeguarding Construction, Alteration, and Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

1.02 SUMMARY

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

1.03 RELATED DOCUMENTS

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

1.04 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 50 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Site Plan; G, LRL

Existing Condition Assessment

1.05 CONSTRUCTION SITE PLAN

Prior to the start of work, submit a site plan showing the locations and dimensions of temporary facilities (including layouts and details, equipment and material storage area (onsite and offsite), and access and haul routes, avenues of ingress/egress to the fenced area and details of the fence installation. Identify any areas which may have to be graveled to prevent the tracking of mud. Indicate if the use of a supplemental or other staging area is desired. Show locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas.

1.06 TEMPORARY UTILITIES

A. Water Service:

At the Contractors expense and in a manner satisfactory to the COR,provide and maintain necessary temporary connections, distribution lines, and meter bases for all water usage. The government will not provide any water for the Contractor's use. The Contractor shall remove any such temporary connections, distribution lines, and meter bases upon completion of the project, restoring conditions prior to work.

B. Electric Power Service:

At the Contractor's expense and in a manner satisfying to the COR, provide and maintain necessary temporary connections, distribution lines, and meter bases for all electricity usage. The government will not provide any electric power for the Contractor's use. The Contractor shall remove any such temporary connections, distributions lines, and meter bases upon completion of the project, restoring conditions prior to work.

C. Sanitary Facilities:

Provide temporary toilets, wash facilities and drinking-water fixtures. Locate at sites approved by the Owner. Facilities in existing buildings are off-limits.

D. Lunchroom Facilities:

On-site facilities are not available to Contractor personnel.

E. Fire Protection

Provide temporary fire protection equipment for the protection of personnel and property during construction. Remove debris and flammable materials daily to minimize potential hazards.

F. Temporary Utilities

Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

1.07 PROTECTION OF BUILDINGS AND PROPERTY

A. Existing Condition Assessment

Perform existing components documentation (videotape, photos, etc.). Documentation shall include but not limited to; asphalt spills, windows, walls, sidewalks, paving, ceilings, etc. Lack of submission prior to commencement of work indicates Contractor has discovered no existing damaged components and takes responsibility for any damages caused by operations.

PART 2 PRODUCTS

2.01 FENCING

If fencing is required all fencing will meet the requirements of EM 385-1-1.

2.02 TEMPORARY WIRING

Provide temporary wiring in accordance with EM 385-1-1 Section 11, NFPA 241 and NFPA 70. Include monthly inspection and testing of all equipment and apparatus.

2.03 Self-Contained Toilet Units:

Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

PART 3 EXECUTION

3.01 EMPLOYEE PARKING

Construction contract employees will park privately owned vehicles in an area designated by the Contracting Officer. This area will be within reasonable walking distance of the construction site. Employee parking must not interfere with existing and established parking requirements of the government installation.

3.02 CONTRACTOR'S TEMPORARY FACILITIES

A. Safety Systems

Protect the integrity of any installed safety systems or personnel safety devices. Obtain prior approval from Contracting Officer if entrance into systems serving safety devices is required. If it is temporarily necessary to remove or disable personnel safety devices in order to accomplish contract requirements, provide alternative means of protection prior to removing or disabling any permanently installed safety devices or equipment and obtain approval from the Contracting Officer.

B. Security Provisions

The Contractor will be responsible for the security of its own equipment and associated materials.

C. Weather Protection of Temporary Facilities and Stored Materials

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday. Ensure that the openings are completely sealed off to protect materials and equipment in the building from damage.

1. Building and Site Storm Protection

When a warning of gale force winds is issued, take precautions to minimize danger to persons, and protect the work and nearby Government property. Precautions must include, but are not limited to, closing openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work. Close openings in the work when storms of lesser intensity pose a threat to the work or any nearby Government property.

3.03 CLEANUP

Remove construction debris, waste materials, packaging material and the like from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways must be cleaned away. Neatly stack stored materials not in trailers, whether new or salvaged.

3.04 RESTORATION OF STORAGE AREA

Upon completion of the project remove the bulletin board, signs, barricades, haul roads, and any other temporary products from the site. Restore areas used during the performance of the contract to the original or better condition.

-- End of Section --

SECTION 06 10 00

ROUGH CARPENTRY
08/16

PART 1 GENERAL

1.01 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA M2	(2016) Standard for the Inspection of Preservative Treated Wood Products for Industrial Use
AWPA M6	(2013) Brands Used on Preservative Treated Materials
AWPA U1	(2017) Use Category System: User Specification for Treated Wood

APA - THE ENGINEERED WOOD ASSOCIATION (APA)

APA L870	(2010) Voluntary Product Standard, PS 1-09, Structural Plywood

ASTM INTERNATIONAL (ASTM)

ASTM A153	(2016) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

FM GLOBAL (FM)

FM 1-49	(2016) Perimeter Flashing

1.02 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 50 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Modifications of Structural Members; G

Drawings of structural laminated members, fabricated wood trusses, engineered wood joists and rafters, and other fabricated structural members indicating materials, shop fabrication, and field erection details; including methods of fastening.

Nailers and Nailing Strips; G, Drawings of field erection details, including materials and methods of fastening nailers in conformance with Factory Mutual wind uplift rated systems specified in other Sections of these specifications.

SD-03 Product Data

SD-05 Design Data

SD-06 Test Reports

Preservative-treated Lumber and Plywood

SD-07 Certificates

Certificates of Grade

Preservative Treatment

SD-10 Operation and Maintenance Data

Take-back Program

Include contact information, summary of procedures, and the limitations and conditions applicable to the project. Indicate manufacturer's commitment to reclaim materials for recycling or reuse.

1.03 DELIVERY AND STORAGE

Deliver materials to the site in an undamaged condition. Store, protect, handle, and install prefabricated structural elements in accordance with manufacturer's instructions and as specified. Store materials off the ground to provide proper ventilation, with drainage to avoid standing water, and protection against ground moisture and dampness. Store materials with a moisture barrier at both the ground level and as a cover forming a well ventilated enclosure. Store wood I-beams and glue-laminated beams and joists on edge. Adhere to requirements for stacking, lifting, bracing, cutting, notching, and special fastening requirements. Do not use materials that have visible moisture or biological growth. Remove defective and damaged materials and provide new materials. Store separated reusable wood waste convenient to cutting station and area of work.

1.04 GRADING AND MARKING

A. Lumber

Mark each piece of framing and board lumber or each bundle of small pieces of lumber with the grade mark of a recognized association or independent inspection agency. Such association or agency must be certified by the Board of Review, American

Lumber Standards Committee, to grade the species used. Surfaces that are to be exposed to view must not bear grademarks, stamps, or any type of identifying mark. Hammer marking will be permitted on timbers when all surfaces will be exposed to view.

B. Plywood

Mark each sheet with the mark of a recognized association or independent inspection agency that maintains continuing control over the quality of the plywood. The mark must identify the plywood by species group or span rating, exposure durability classification, grade, and compliance with APA L870. Surfaces that are to be exposed to view must not bear grademarks or other types of identifying marks.

C. Preservative-Treated Lumber and Plywood

The Contractor is responsible for the quality of treated wood products. Each treated piece must be inspected in accordance with AWPA M2 and permanently marked or branded, by the producer, in accordance with AWPA M6. The Contractor must provide Contracting Officer's Representative (COR) with the inspection report of an approved independent inspection agency that offered products comply with applicable AWPA Standards. The appropriate Quality Mark on each piece will be accepted, in lieu of inspection reports, as evidence of compliance with applicable AWPA treatment standards.

1.05 MOISTURE CONTENT

Air-dry or kiln-dry lumber. Kiln-dry treated lumber after treatment. Maximum moisture content of wood products must be as follows at the time of delivery to the job site:

a. Framing lumber and board, 19 percent maximum

b. Timbers 5 inches and thicker, 25 percent maximum

d. Materials other than lumber; moisture content must be in accordance with standard under which the product is produced

1.06 PRESERVATIVE TREATMENT

A. 0.25 pcf intended for above ground use.

B. 0.40 pcf intended for ground contact and fresh water use. 0.60 pcf intended for Ammoniacal Copper Quaternary Compound (ACQ)-treated foundations. 0.80 to 1.00 pcf intended for ACQ-treated pilings. All wood must be air or kiln dried after treatment. Specific treatments must be verified by the report of an approved independent inspection agency, or the AWPA Quality Mark on each piece. Do not incise surfaces of lumber that will be exposed. Brush coat areas that are cut or drilled after treatment with either the same preservative used in the treatment or with a 2 percent copper naphthenate solution. All lumber and woodwork must be preservative treated. Plastic lumber must not be preservative treated. The following items must be preservative treated:

(1) Wood framing, woodwork, and plywood up to and including the

subflooring at the first-floor level of structures having crawl spaces when the bottoms of such items are 24 inches or less from the earth underneath.

(2) Wood members that are in contact with water.

(3) Exterior wood steps, platforms, and railings; and all wood framing of open, roofed structures.

(4) Wood sills, soles, plates, furring, and sleepers that are less than 24 inches from the ground, furring and nailers that are set into or in contact with concrete or masonry.

(5) Nailers, edge strips, crickets, curbs, and cants for roof decks.

1.07 CERTIFICATIONS

A. Certified Wood Grades

Provide certificates of grade from the grading agency on graded but unmarked lumber or plywood attesting that materials meet the grade requirements specified herein.

PART 2 PRODUCTS

2.01 MATERIALS

A. Lumber:

Shall Be No. 2 or better spruce or southern yellow pine. Shall be sound, thoroughly seasoned, dressed to nominal finish dimension, and free of warpage, cupping, and bowing. Dimensions shall be determined by job conditions or as indicated in detail drawings.

B. Plywood Sheathing

Shall be structural 1 rated. Plywood shall be stamped APA RATED SHEATHING grade-C or better, and shall be manufactured with exterior glue (exposure 1).

C. Preservative Treatment for Above Ground Use:

Alkine Copper Quaternary (ACQ) pressure treatment in accordance with AWPA Standard U1 and P5, P26, P27, P28, P29 as appropriate. Preservative retention shall be 0.15 lb/cu ft of ACQ in accordance with AWPA U1. All material shall be kiln dried after treatment to 19 percent or less moisture content.

2.02 PLYWOOD

A. Roof Sheathing

1. Plywood

C-D Grade, Exposure 1, with an Identification Index of not less than 24/0. Provide exterior grade material with phenol resin for all applications.

B. Other Uses

1. Plywood

Plywood for miscellaneous flashing details where shown on drawings. C-D Grade, Exposure 1.

2.03 FASTENERS

A. Wood to steel deck

Shall be #14-13 DP1, pancake or panhead, corrosion resistant, ASTM A153, FM Approved, self-drilling and self-tapping screw, length to provide minimum 3 pitches of thread through metal thicknesses.

B. Wood to wood:

Screws: No. 10 or greater, stainless steel wood screws with flat head, or insulation screws. Length to embed into base substrate a minimum of 1-1/2".

Nails: 8, 10 or 16 penny, stainless steel, ring shank nails. Length to embed into base substrate a minimum 1-1/2".

C. Masonry Anchor

Masonry screws, 1/4 inch minimum diameter, Type 410 stainless steel with flat head. Length to provide minimum 1" embedment into substrate.

D. Toggle Bolt:

Shall be ¼" diameter toggle bolt consisting of machine screw and spring wing toggle with flat mushroom head, length as required by conditions.

E. Washers:

Fasteners heads for screws, anchors and bolts terminating at the surface of nailers shall be provided with a minimum 5/8 inch diameter, stainless steel or similar corrosion resistance flat washer provided by fastener manufacturer, unless washer is provided from factory as part of the fastener assembly.

PART 3 EXECUTION

3.01 INSTALLATION

Remove existing damaged or deteriorated wood blocking, nailers, and curbs and replace with new material of same dimensions.

Re-secure all existing wood nailers at roof edges that are to remain. Fastener type and spacing shall comply with this specification.

Install new wood blocking, nailers, and curbs to achieve a minimum eight inch flashing height above the roof membrane. Wood nailers at perimeter roof edges and expansion joints shall be installed to match

insulation height. Maintain constant nailer height at perimeter edges.

Except where indicated otherwise, nailers must be 6 inches wide and the same thickness as the insulation.

Wood blocking and nailers shall be installed concurrently with roof system installation. Removal of insulation and/or folding back of roof membrane to install wood blocking and nailers at a later date is not acceptable.

Set rough carpentry to required levels and lines, with members plumb, true to line, material cut to fit, and braced to hold work in proper position. Use a belt sander to remove any obtrusive surface irregularities. Drive nails and spikes home; and pull bolt nuts tight with heads and washers in close contact with the wood.

Fit rough carpentry to other construction; scribe and cope for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction. All joints between wood shall be installed for a smooth transition.

A. Attachment

The Contractor shall consult the fastener manufacturer's published literature and follow the recommended requirements for pre-drilling, cleaning, placement and compatibility of substrates. Follow manufacturer's requirements for fasteners spacing, substrate preparation and substrate embedment where not specified.

Securely attach rough carpentry work to substrate with fasteners. Anchor to resist a minimum force of 300 lbs/lineal foot in any direction.

Rough carpentry attachment shall meet the requirements herein and that of the current FM Loss Prevention Data Sheet FM 1-49, Perimeter Flashing.

Install bolts flush with the top surface of nailers where possible to avoid countersinking. Bolt bottom nailers then fasten upper nailers where possible. Countersink bolts, nuts and screws flush with wood surfaces only as detailed.

Install fasteners without splitting wood. Pre-drill where necessary. Split or damaged wood shall be removed, or repaired and/or re-secured to provide acceptable conditions.

For anchors, pre-drill concrete and masonry units to prevent damage or cracking of the masonry. Consult fastener manufacturer's published guides. Damaged masonry shall be repaired, and fasteners shall be removed and re-installed in an acceptable location.

Select fasteners of size and length that will not be exposed from the building interior and/or from the ground, or remove protruding fasteners, paint or finish to eliminate exposure.

Thickness of wood nailers shall be flush with adjacent insulation

and other materials. Additional fasteners shall be installed to ensure nailers are flush.

Unless otherwise detailed, plywood used as blocking or shim shall be installed below dimensional lumber such that the fastener head terminates at the dimensional lumber surface.

Wood nailers at roof perimeters, expansion joints, roof area dividers, etc. shall not be less than 3 feet long.

When multiple nailers are installed stacked two high or more, offset nailers no less than 12" such that joints at nailer end do not line-up vertically.

Each end of nailers shall be fastened with additional fasteners to ensure a smooth transition at butted joints, and to prevent warping and/or twisting.

1. Fastener Spacing:

   Fasteners shall be staggered 1/3 the board width and installed within 6" of each end.

   Screws and 1/4 inch diameter anchors securing wood to concrete or masonry units shall be spaced 12 inches on center maximum, staggered, with fasteners installed at each end of nailer lengths to prevent wood from twisting at board joints.

   Screws securing wood to wood shall be installed 12 inches apart, staggered, with two screws installed within 6 inches of each end of nailer lengths to prevent wood from twisting at board joints.

   Screws securing wood to steel decking shall be 12 inches apart.

   Self-drilling, and/or pre-drilled self-tapping screws securing wood to structural steel shall be spaced 12 inches apart, staggered, with one screw within 6 inches of each end of nailer lengths to prevent wood from twisting at board joints.

   Nails securing wood to wood shall be spaced 12 inches apart, staggered, with two nails installed within 6 inches of each end of nailer lengths to prevent wood from twisting at board joints.

-- End of Section --

SECTION 07 01 50

PREPARATION FOR REROOFING
06/19

PART 1 GENERAL

1.01 SECTION INCLUDES

Prepatory work to be completed prior to roof installation including but not limited to:

Removal of existing roof assemblies down to the structural deck.

Repairs to structural deck.

Fastener withdrawal tests on Roof Areas A, C, F, G both lightweight/gypsum fill and wood deck areas.

Raising of mechanical units/HVAC units to meet the required minimum flashing height.

Roof Drain inspection and Repair.

1.02 RELATED DOCUMENTS

Drawings and general provisions of the Contract and Specification Sections apply to this Section.

1.03 EXISTING ROOF ASSEMBLIES

A. Roof system compositions are based on random sampling. Contractor is responsible for verification of roof system composition.

B. Roof Areas A, C

3-inch standing seam, 24-inch trapezoidal metal roof panel
Fiberglass batt insulation fill
4-inch retrofit zee purlins
Nominal 2x wood blocking
Two layers 30# felt
Gypsum over form board

C. Roof Area B

3-inch standing seam, 24-inch trapezoidal metal roof panel
Fiberglass batt insulation fill
4-inch retrofit zee purlins
Nominal 2x wood blocking
Two layers 30# felt
Concrete decking

D. Roof Area D

Granular surfaced two-ply modified bitumen
1/4-inch gypsum coverboard
1.5-inch polyisocyanurate flute fill

Metal Roof R-Panel
Fiberglass batt
Structural purlins

E. Roof Area E

Granular surfaced two-ply modified bitumen
4-inch polyisocyanurate
Metal decking

F. Roof Area F

Granular surfaced two-ply modified bitumen
1-inch mineral perlite
1.75-inch polyisocyanurate insulation
Fiberglass base sheet
Plywood decking

G. Roof Area G

Granular surfaced two-ply modified bitumen
1-inch mineral perlite
1.75-inch polyisocyanurate insulation
Fiberglass base sheet
Gypsum over form board

1.04 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 50 SUBMITTAL PROCEDURES:

SD-03 Product Data

Soil Pipe Extensions; G,

Galvanized Steel Plates; G,

Roof Deck; G,

Roof Deck Fasteners; G,

Deck Repair Coating; G,

Roof Drains; G,

Condensate Pipe Support

Gas Line Support

Poured Gypsum

1.05 QUALITY ASSURANCE

Qualifications: Previous experience removing existing roof systems.

Requirements: Contractor to comply with governing EPA regulations and haul-ing/disposal regulations of authorities having jurisdiction.

PART 2 PRODUCTS

2.01 MATERIALS

A. Poured Gypsum

Gypsum Fill: Shall be gypsum concrete fill composed of calcined gypsum and wood chips/shavings conforming to ASTM C317.

Gypsum Formboard shall be ½" thick moisture resistant rigid board with a treat-ed gypsum core, glass mat top and bottom surfaces, and meet ASTM C1177.

Wire Mesh shall be galvanized woven wire mesh with 16-gauge straight wires and 19-gauge diagonal wires.

Steel Support Angles shall be 2" by 2" by ¼" steel angle meeting ASTM A36.

B. Steel Deck

1. Roof Deck:

FM Approved or UL listed 22 gauge minimum; galvanized steel profile to conform to existing deck profile at end and side laps.

2. Roof Deck Fasteners:

a. Deck-to-structural steel:

Fasteners shall be FM Approved, self-drilling deck fasteners of length and type as required by fastener manufacturer for thickness of structural steel. Acceptable manufacturers include:

1. ITW Buildex Corp. 12-24 Tek 5
2. SFS Intec Impax 12-24 SD5
3. Blazer 1/4-20 DP5

b. Deck-to-deck side lap fasteners:

Fasteners shall be FM Approved self-drilling deck side lap fasteners of length and type as required by fastener manufacturer for thickness of steel deck. Acceptable manufacturers include:

1. ITW Buildex Corp. 10-16 Tek 3
2. SFS Intec #10-16 SD3
3. Blazer #10-16 DP3

3. Deck Repair Coating:

Shall be high solids, low VOC, self-priming epoxy coating for use on steel structures such as:

1. Amerlock 400 as manufactured by Ameron InternationalBar-Rust 231 as manufactured by Devoe
2. High Build Epoxy Mastic as manufactured by Duron
3. P45 Epoxy Mastic Coating as manufactured by Benjamin Moore & Co.
4. Engineer approved equal

C. Galvanized Steel Plates:

Steel Plates for Concrete Deck Openings of size to extend a minimum of 6" beyond opening on each side of thickness as indicated in Contract Drawings.

Deck opening up to 8" in any one direction: 18 gauge

Deck opening from 8" to 13" in any one direction: 16 gauge

Deck opening from 13" to 24" in any one direction: 1/8" thick

Deck opening greater than 24" in any one direction: As shown on drawings or as de-termined by Engineer

D. Soil Pipe Extensions

Provide no-hub coupling with coupling conforming to CISPI 310 and ASTM C 1277. Gasket to be made from elastomeric compound meeting ASTM C 564. 5/16" hex-head screw band assembly. Inside diameter to match outside diame-ter of soil pipe being raised.

Solid-wall white PVC pipe of diameter to match existing and length as neces-sary to provide minimum 8" and maximum 12" flashing height.

E. Roof Drains

1. Existing Roof Drains:

Replace clamping ring and strainer dome to match existing roof manufacturer and model with cast iron clamping ring and strainer dome with stainless steel clamping ring bolts.

2. Roof Drain:

Premanufactured roof drain with cast iron components including body, no hub outlet, under deck clamp, adjustable extension sleeve, clamping ring and strainer dome. Provide stainless steel bolts for securement of clamping ring. Acceptable Roof Drain Manufacturers include Josam Company, Smith Manufacturing Company, Zurn Industries, Inc. or Engineer's accepted equivalent.

F. Condensate Pipe Support:

Smooth EPDM rubber condensate pipe support sized to fit the diameter of the pipe being supported and height adjustable. Acceptable products include:

1. Olympic Olyflow PipeGuard
2. Erico Caddy Pyramid EZ Series
3. Portable Pipe Hangers
4. Miro Industries

G. Gas Line Support

Pipe support bar and clamps sized to fit the diameter of the pipes being supported and height adjustable. Basis of design: MIRO Industries - Stanchioned Pipe Support - C3X5

PART 3 EXECUTION

3.01 EXAMINATION

Survey existing conditions to determine extent of demolition.

Record the conditions of items to be removed/reinstalled and items to be re-moved/salvaged.

Contractor shall not remove any element that may result in structural deficiency or col-lapse of any part of the structure or adjacent structures during demolition.

Contractor to inspect substrate for soundness and notify Engineer in writing of any defi-ciencies. Commencement of work signifies Contractor's acceptance of site conditions.

3.02 UTILITIES/SERVICES

A. Existing Utilities

Maintain existing utilities that are to remain in service and protect them against damage during selective site demolition unless authorized in writing by the Owner and authori-ties having jurisdiction.

Locate all conduits and equipment attached to the underside of the decking prior to reroofing. Insulation fastener locations are not to disturb existing conduits or interior components/equipment.

If utilities serving occupied portions of the site must be shut down, temporary services shall be provided.

Provide 72 hours notice to Owner if shut down is required.

Where services are to be removed, relocated or abandoned, provide necessary bypass connections to remaining occupied buildings and areas.

3.03 PREPARATION

Do not begin demolition until utilities have been disconnected/sealed and have been ver-ified as such in writing.

Do not close off or obstruct streets, walks or other adjacent occupied facilities without permission from Owner and authorities having jurisdiction.

Provide safe conditions for pedestrians. Erect temporary protection such as walkways, fences, railings and canopies as required by OSHA and other governing authorities.

Provide protection for adjacent building, appurtenances and landscaping to remain. Erect temporary fencing around trees to remain.

Provide temporary weather protection as required to prevent water leakage and dam-aged to exterior or interior of adjacent structures.

3.04 POLUTION CONTROLS

Use water, mist, temporary enclosures and other suitable methods to limit the spread of dust and dirt. Comply with local EPA regulations.

> Do not use water where damage may occur or where hazardous conditions would be created such as ice or flooding.

3.05 REMOVALS

Demolish and remove existing construction only to the extent required by new construc-tion.

Remove all existing roofing, roof insulation, membrane and sheet metal and discard.

Remove or correct any obstruction which might interfere with the proper application of new materials.

Lift or remove all existing equipment so that existing flashings can be totally removed and new flashings installed.

Remove debris from existing materials to provide clean, dry substrate.

Demolish asphalt, concrete and masonry in small sections. Cut concrete and masonry at juncture with construction to remain using powered masonry saw, core drill or hand tools. Do not use powered impact tools.

Remove and transport debris in a manner that will prevent damage/spills to adjacent buildings and areas.

Dispose of demolished items and materials on a daily basis. On-site storage of re-moved items is not permitted.

Transport demolished materials off-site and dispose of materials in a legal manner.

Perform progress inspections to detect hazards resulting from demolition activities.

3.06 FLASHING HEIGHTS

Permanently raise roof top equipment as required to achieve 8" minimum flashing height.

Provide additional wood blocking to top of parapet walls and expansion joints to achieve minimum 8" flashing height.

A. Sanitary Vents

Extend all existing sanitary vents to height required by the applicable Plumbing Code, but no less than 8 inches and no more than 12 inches above the finished roof system.

1. Preparation (No Hub)

For soil pipes that do not provide minimum 8" flashing height, cut exist-ing pipe so that no-hub coupling can be located within roof insulation system.

2. Installation

Provide no-hub coupling installed and torqued in accordance with manu-facturer's installation instructions.

Provide PVC pipe extension to provide a minimum 8" and maximum 12" flashing height

3.07 ROOF DRAINS AND LEADERS

A. Inspection

Prior to commencement of any work on the project the Contractor shall inspect each existing roof drain for damage and water flow.

Each drain shall be cleaned of accumulated debris and loose gravel. Drain bowl and drain outlet shall be cleaned of bitumen build-up to bare metal by hand scraping.

A power vacuum shall be provided by the Contractor and utilized to vacuum debris, loose gravel, and bitumen scrapping. Vacuum hose shall be of sufficient length to reach the first elbow in the drain line in order to vacuum the line.

After cleaning bitumen from the drain bowl, Contractor shall inspect the bowl carefully for cracks, and the drain pipe connection for possible deterioration.

Each drain shall be water tested for proper flow utilizing a minimum 3/4-inch hose. Water shall flow into the drain line under maximum pressure available for a period of not less than 15 minutes.

Drain inspection and testing operation shall precede any roofing tear-off. If de-ficiencies or damages are observed, Contractor shall record the deficiency on a Roof Plan and forward to the Engineer. The Engineer will notify the Owner's Maintenance Department accordingly. Contractor shall allow 48 hours after notification for any corrective work by the Owner.

If no deficiencies or damages are reported to the Owner prior to commencement of work, Contractor shall assume full responsibility for the condition and opera-tion of the drains.

Contractor shall install temporary drain plugs while performing any work at or near the roof drains. Drain plugs shall be removed at the end of each work day.

B. Roof Drain Lowering

Inspect all existing drain bowls for elevation relative to top surface of roof deck.

Remove vertical portion of drain leader and lower bowl so flange is located where indicated in Contract Drawings.

3.08 ROOF DECK REPAIR

Inspect the roof deck carefully. If there are roof deck areas which require repair or replacecment, notify the COR. Do not proceed with repair or replacement until directed by the COR.

3.09 STEEL DECK REPAIR

Where steel deck is rusted but remains structurally sound, thoroughly clean deck units of rust and foreign matter with a wire brush. Paint with specified metal primer.

Where steel deck is damaged or rusted through in small areas, clean deck units of rust with a wire brush. Paint with specified metal primer. Install over the damaged area a steel plate secured to the existing steel deck with sheet metal screws around the perime-ter of the plate at 6 inches on center. Extend the new steel plate a minimum of 6 inch-es onto the surface of the existing steel deck beyond the damaged area.

Where steel deck units are severely damaged or have deteriorated over large areas, re-move the entire existing deck unit and install new decking of the same type and gauge as the existing. Lap new deck units over the existing the same manner as originally in-stalled but not less than 6 inches. Lap ends only over structural framing. Secure to structural framing with specified fasteners at 6 inches on center at each framing mem-ber. Secure deck side laps at not more than 36 inches on center.

Workers shall apply their weight over the area being fastened to prevent deck deflection and ensure complete contact between fasteners, deck and/or structural steel.

3.10 STEEL PLATE INSTALLATION

Mechanically attach deck repair plates to concrete deck with approved fasteners 6" on center or a minimum of 2 fasteners per side.

3.11 COUNTERFLASHING PREPARATION

Receiver Flashing to Remain: Neatly bend existing receiver up at walls as required to completely remove existing base flashings and

counterflashings and to install new base flashings and counterflashings. After installation of new base flashings and counter-flashings, neatly bend counterflashing receiver back in place using sufficient care to prevent deformation to the finished counterflashing.

Saw reglet to a maximum depth of 1-1/4 inches in a straight line to allow proper installa-tion of new counterflashings. Utilize all procedures necessary including, but not limited to, saw guides to ensure straight, clean reglets.

3.12 FASTENER WITHDRAWAL TESTS

Conduct fastener pull tests in accordance with ANSI/SPRI FX-1-2001 requirements. Perform a minimum of 5 pull tests per individual roof area. Provide a report along with a roof plan showing test locations and corresponding withdrawal value of each pull test. Minimum withdrawal value to be 40 pounds. Testing to be performed either by manu-facturer of fasteners tested or by roof manufacturer.

3.13 CLEANING

Inspect the site daily and clean up debris and hazards at the end of each day. Adjacent roads, drives and walkways shall remain in operation and free from construction materi-als debris.

Clean adjacent structures of dust dirt and debris. Return adjacent areas to original con-ditions to the satisfaction of the Owner.

-- End of Section --

SECTION 07 52 00.00 48

SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM
10/10

PART 1 GENERAL

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/SPRI ES-1	(2003) Wind Design Standard for Edge Systems Used with Low Slope Roof Systems

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE/SEI 7-10,	(2010) Minimum Design Loads for Buildings and Other Structures

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.24	(2006) Roofing - Safety Requirements of Low-Sloped Roofs
ASSE/SAFE Z87.1	(2003) Standard for Occupational and Educational Eye and Face Protection

ASPHALT ROOFING MANUFACTURER'S ASSOCIATION (ARMA)

ARMA 410BUR88	(2001) Manual of Roof Maintenance and Repair
ARMA 460LSR97	(2002) NRCA/MRCA Repair Manual for Low Slope Membrane Roof Systems
ARMA PMBRG98	(1998) Quality Control Guideline for the Application of Polymer Modified Bitumen Roofing

ASTM INTERNATIONAL (ASTM)

ASTM C 1289	(2010) Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board

ASTM C 208	(2008a) Cellulosic Fiber Insulating Board
ASTM C 728	(2005; R 2010) Perlite Thermal Insulation Board
ASTM D 1668	(1997a; R 2006) Glass Fabrics (Woven and Treated) for Roofing and Waterproofing
ASTM D 1863	(2005) Mineral Aggregate Used on Built-Up Roofs
ASTM D 2170	(2007) Kinematic Viscosity of Asphalts (Bitumens)
ASTM D 312	(2000; R 2006) Standard Specification for Asphalt Used in Roofing
ASTM D 3617	(2007) Sampling and Analysis of New Built-Up Roof Membranes
ASTM D 4073	(2006) Standard Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes
ASTM D 41	(2005) Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
ASTM D 4402	(2006) Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer
ASTM D 4586	(2007) Asphalt Roof Cement, Asbestos-Free
ASTM D 4601	(2004) Asphalt-Coated Glass Fiber Base Sheet Used in Roofing
ASTM D 5147	(2007b) Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material
ASTM D 6163	(2000; R 2008) Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements
ASTM D 6164	(2009) Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements
ASTM D 6298	(2005; E 2008) Fiberglass Reinforced Styrene-Butadiene-Styrene (SBS) Modified Bituminous Sheet with Factory Applied Metal Surface
ASTM E 108	(2010a) Fire Tests of Roof Coverings

FM GLOBAL (FM)

FM 4470	(1986; R 1992) Class I Roof Covers

FM APP GUIDE	(updated on-line) Approval Guide http://www.approvalguide.com/CC_host/pages/public/custom/FM/login.cfm

INTERNATIONAL CODE COUNCIL (ICC)

ICC IBC	(2009; Errata First Printing) International Building Code

MIDWEST ROOFING CONTRACTORS ASSOCIATION (MRCA)

CERTA	(2003) NRCA/MRCA Certified Roofing Torch Applicator Program

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241	(2009) Standard for Safeguarding Construction,Alteration, and Demolition Operations
NFPA 58	(2008; Am 08-1; Am 08-2; Am 08-3; Amt 08-4) Liquefied Petroleum Gas Code

NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)

NRCA Details	(2003) NRCA Roof Perimeter Flashing Systems Construction Details for Class 1 Roof Construction
NRCA 0405	(2001; R 2003, 5th Ed) Roofing and Waterproofing Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.12	Construction Work
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.16	Rules of Construction

UNDERWRITERS LABORATORIES (UL)

UL 790	(2004; R 2008) Standard for Test Methods for Fire Tests of Roof Coverings
UL RMSD	(2009) Roofing Materials and Systems Directory

1.2 SUMMARY

1.2.1 This Section includes the following:

1.2.1.1 SBS-modified bituminous membrane roofing.

1.2.1.2 Roof insulation.

1.2.2 Related Sections include the following:

1.2.2.1 Division 7 Section "Flashing and Sheet Metal."

1.3 PERFORMANCE REQUIREMENTS

1.3.1 Provide a roofing system that complies with the requirements of Underwriters' Laboratories, Inc. for a Class A roof covering.

1.3.2 Provide a roofing system that complies with the requirements of FM Global for a Class 1A-90 roof covering.

1.3.3 Provide adequate fastening of the roofing system to meet or exceed the requirements of ASCE/SEI 7-10 "Minimum Design Loads for Buildings and Other Structures".

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval.. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 50 SUBMITTAL PROCEDURES:

Acceptable Manufacturer Products

Manufacturer products listed in this specification are referenced to establish a standard of quality. When the specific product listed is submitted by the Contractor that submittal will be considered For Information Only. When an equal to that named in this specification is submitted it shall be For Government Approval (G). The following manufacturer products are specifically mentioned in this specification:

Siplast 1000 E Rochelle Blvd. Irving, TX 75062 (800) 922-8800 www.siplast.com	SBS-MODIFIED BITUMINOUS MEMBRANE 20 year NDL Warranty (with an extended 10 year option)
Johns Manville 10100 W. Ute Avenue Littleton, CO 80127 (303) 978-2000 www.jm.com	SBS-MODIFIED BITUMINOUS MEMBRANE 20 year NDL Warranty
Soprema, Inc. 310 Quadral Drive Wadsworth, OH 44281 (800) 356-3521 www.soprema.us	SBS-MODIFIED BITUMINOUS MEMBRANE 20 year NDL Warranty
Georgia-Pacific 133 Peachtree Street NE	DENS-DECK PRIME ROOF BOARD

Atlanta, GA 30303
(404) 652-4000
www.gp.com

Manufacturer Products submitted as an "or equal"; **G, ED**

SD-02 Shop Drawings

Tapered Insulation Shop Drawings: Submit proposed tapered insulation and cricket system for approval prior to start of work. Provide drawings for each area and include, at minimum, concise tapered layouts, material identification, typical cross sections with each board labeled, board stagger pattern, slopes and cricket widths.

Roof Plan

SD-03 Product Data

Materials List: Give written notification of the brand name and manufacturer of each material proposed for use and include a statement that all proposed materials meet the specification requirements. Obtain approval prior to placing orders.

Submittal of catalog cut sheets, etc. in lieu of the materials list required above is not acceptable. Do not submit cut sheets unless specifically requested.

Submit all data required with requirements of this section. Include in Data written acceptance by the roof membrane manufacturer of the products and accessories provided. List products in the applicable wind uplift and fire rating classification listings, unless approved otherwise by the Contracting Officer.

Pre-Manufactured Accessories; G

Base Sheet Materials; G

Membrane Materials; G

Fluid Applied Flashing System; G

Bituminous Materials; G

Insulation / Board Goods; G

Fasteners; G

SD-05 Design Data

Wind Uplift Calculations; G

Provide Engineering calculations, signed, sealed, and dated by a qualified Engineer validating the wind resistance per ASCE/SEI 7-10, ASTM D 4073, and ANSI/SPRI ES-1 of non-rated roof system.

SD-06 Test Reports

Samples of Built-Up Roofing; G

Submit test results on roofing field samples as required, verifying composition of sample. Submit six copies of laboratory analysis within 30 calendar days after samples are taken. Submit reports in accordance with ASTM D 3617.

SD-07 Certificates

Qualification of Applicator/Installer; G

Applicator/Installer Certificates: Signed by roofing system manufacturer certifying that Applicator/Installer is approved, authorized, or licensed by manufacturer to apply the roofing system.

Qualification of Manufacturer; G

Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

Manufacturer Certificates: Original document signed by a responsible officer of the manufacturing firm, notarized, on manufacturer's standard letterhead, certifying materials furnished for project comply with the referenced standard. Certificate shall specifically reference the project and applicable compliance standard.

Qualification of Engineer of Record; G

Certify that the Engineer of Record is fully qualified, competent, and currently licensed to practice in the project jurisdiction.

Insulation Certificate; G

Insulation Certificate: Signed by insulation manufacturer stating that insulation shipped to this project complies with requirements listed in Part 2 PRODUCTS.

Wind Uplift Resistance; G Submit the roof system assembly wind uplift classification listing.

Fire Resistance classification; G Submit the roof system assembly fire rating classification listing.

SD-08 Manufacturer's Instructions

Installation Instructions:; G Submit manufacturer's latest written installation instructions.

Base Flashing Instructions:; G Submit manufacturer's base flashing installation instructions.

Cold Weather Installation; G

SD-11 Closeout Submittals

WARRANTY; G

Warranties: Special warranties specified in this Section.

Sample Warranty: Specimen copy of manufacturer's warranty.

INSPECTION REPORT

Inspection Report: Specimen copy of roofing system manufacturer's inspection report of completed roofing installation.

1.5 QUALITY ASSURANCE

1.5.1 Qualification of Applicator/Installer

The roofing system applicator must be approved, authorized, and licensed in writing by the roofing system manufacturer and must have a minimum of 3 years experience as an approved, authorized, and licensed applicator with the manufacturer and be approved at a level capable of providing the specified warranty.

1.5.2 Qualification of Manufacturer

SBS-Modified bitumen sheet roofing system manufacturer must have a minimum of 5 years experience in manufacturing SBS-Modified bitumen roofing products.

1.5.3 Qualification of Engineer of Record

Engineer of Record must be currently licensed within the jurisdiction of the project.

Wind uplift requirementsin accordance with Local and State codes

Snow load requirements per ICC IBC Chapter 16 Section 1608.3 and Section 7 of ASCE/SEI 7-10

1.5.4 Fire Resistance

Complete roof covering assembly must:

a. Be Class A rated in accordance with ASTM E 108, FM 4470, or UL 790; and

b. Be listed as part of Fire-Classified roof deck construction in UL RMSD, or Class I roof deck construction in FM APP GUIDE.

FM or UL approved components of the roof covering assembly must bear the appropriate FM or UL label.

1.5.5 Wind Uplift Resistance

Complete roof covering assembly, including insulation, must be rated Class 1A-90 in accordance with FM APP GUIDE and ASTM D 4073 capable of withstanding an field uplift pressure of -30.1 psf. Non-rated systems must not be installed. Base all Wind uplift calculations on a design wind speed of 135 mph in accordance with ASCE/SEI 7-10, ASTM D 4073, or applicable building code requirements.

1.5.6 Pre-Construction Conference

After approval of submittals and before performing roofing system installation work, hold a pre-Construction conference to review the following:

a. Drawings, including Roof Plan, specifications and submittals related to the roof work;

Field inspection and verification of all existing conditions, including all fire safety issues, existing structure, and existing materials, including concealed combustibles, which may require additional protection during installation.

b. Roof system components installation;

c. Procedure for the roof manufacturer's technical representative's onsite inspection and acceptance of the roof structure, and roofing substrate, the name of the manufacturer's technical representatives, the frequency of the onsite visits, distribution of copies of the inspection reports from the manufacturer's technical representatives to roof manufacturer;

d. Contractor's plan for coordination of the work of the various trades involved in providing the roofing system and other components secured to the roofing; and

e. Mutual understanding of quality;

f. Mutual understanding of safety.

Coordinate pre-Construction conference scheduling with the Contracting Officer. The conference must be attended by the Contractor, the Contracting Officer's designated personnel, and personnel directly responsible for the installation of roofing and insulation, flashing and sheet metal work, mechanical and electrical work, other trades interfacing with the roof work, Site Safety Health Officer trained to enforce and comply with ASSE/SAFE A10.24,Registered Roof Observer, and representative of the roofing materials manufacturer. Before beginning roofing work, provide a copy of meeting notes and action items to all attending parties. Note action items requiring resolution prior to start of roof work.

1.6 DELIVERY, STORAGE, AND HANDLING

1.6.1 Delivery

Deliver all materials to site in original containers bearing manufacturers' name and type of material. Provide appropriate Underwriters' Laboratories, inc. and Factory Mutual labels on all materials.

Supply and keep all materials dry at all times prior to application.

Materials which have been prematurely exposed to the weather are subject to immediate removal and replacement with new materials at contractor's expense. Materials may be marked with paint or other indelible materials while they remain on-site.

Where materials are covered by a referenced specification, container must bear specification number, type, and class, as applicable.

Indicate on labels for roofing asphalt the asphalt type, finished blowing temperature (FBT), flash point (FP), and equiviscous temperature (EVT), that is, the temperature at which the viscosity is either 125 centistokes when tested in accordance with ASTM D 2170 or 75 centipoise when tested in accordance with ASTM D 4402. Deliver materials in sufficient quantity to allow work to proceed without interruption.

1.6.2 Storage

Protect materials against moisture absorption, contamination, or other damage. Avoid crushing or crinkling of roll materials.

Store all roll goods on end on clean floors or raised platforms in dry locations in enclosed buildings or trailers with adequate ventilation.. Do not use flattened rolls or rolls with ends damaged. Mark and remove wet or damaged materials from site.

Store all insulation materials in dry, covered storage, or on raised platforms, and with weatherproof, breathable coverings such as heavy canvas. Insulation wrappers are not sufficient. Materials which are not stored under specified covers are subject to removal from the site.

Store cartons and drums of asphalt on level surface, in upright position. Do not stack cartons. Protect open top containers from dirt and precipitation.

Store solvent bearing materials in dry, cool storage and keep lids tight on partially used containers to prevent escape of solvents.

Store all emulsions in dry storage at temperatures above 40 degrees F.

Do not store roll materials in buildings under construction until concrete, mortar, and plaster work are finished and dry.

Do not store materials outdoors unless approved by the Contracting Officer. Completely cover felts stored outdoors with waterproof canvas protective covering. Do not use polyethylene sheet as a covering.

Tie covering securely to pallets to make completely weatherproof and yet provide sufficient ventilation to prevent condensation.

Maintain roll materials at temperature above 50 degrees F for a 24-hour period immediately prior to application.

Keep aggregate dry as defined by ASTM D 1863.

Place only those materials to be used during one day's work on the roof at one time. Remove unused materials from the roof at the end of each day's work. Immediately remove wet, contaminated or otherwise damaged or unsuitable materials from the site. Damaged materials may be marked by the Contracting Officer.

1.6.3 Handling

Prevent damage to edges and ends of roll materials. Do not install damaged materials in the work. Select and operate material handling

equipment so as not to damage materials or applied roofing.

1.7 ENVIRONMENTAL REQUIREMENTS

Do not install roofing system when air temperature is below 40 degrees F, during any form of precipitation, including fog, or when there is ice, frost, moisture, or any other visible dampness on the roof deck. Follow manufacturer's printed instructions for Cold Weather Installation.

1.8 TORCH AND HOT-MOPPED ASPHALT APPLIED MODIFIED BITUMEN MEMBRANE SAFETY

1.8.1 Property Protection

Take all precautions necessary to prevent ignition of combustible materials during torch application and hot-mopped asphalt application of roofing. Immediately call the fire department if a fire commences. Review all fire safety procedures as outlined at the pre-roofing conference.

Install materials using the techniques recommended by CERTA NRCA/MRCA Certified Roofing Torch Applicator Program available from the National Roofing Contractors Association (NRCA) and the Midwest Roofing Contractors Association (MRCA} as endorsed by the Asphalt Roofing Manufacturers Association (ARMA) and the United Union of Roofers, Waterproofers and Allied Workers. Application procedures must comply with NFPA 241, OSHA 29 CFR 1910 and 29 CFR 1910.12, 29 CFR 1926.16, 29 CFR 1926 Subpart F.

Do not store flammable liquids on the roof.

Provide a minimum of two 2.65 gallon containers of water and two fully charged minimum 20 pound ABC (dry chemical) fire extinguishers in separate, easily accessible locations on the roof and within 10 foot of each torch work area and hot-mopped kettle at all times.

No Asphalt/Tar Kettles are allowed on roofs. Locate kettles and supply LP-Gas Cylinders safely and secured per NFPA 241 outside of the building's perimeter a minimum of 20 foot from the structure and any combustible materials.

Maintain a minimum separation of 20 foot between LP-Gas Cylinders and kettle. Provide protective fire retardant blanket barrier or shield between any building structure to a minimum height of 8 foot and a clear surround distance of 4 foot if operations force placement of kettle within a distance of 20 foot. Do not obstruct or place kettles or Cylinder storage within 10 foot of exits, means of egress, gates, roadways, entrances. Locate kettles downwind and away from any building air intakes.

Provide a minimum of two portable fully charged 20 pound ABC (dry chemical) fire extinguishers no closer than 5 foot and no further than 25 foot of horizontal travel distance from each kettle at all times while kettle is in operation, in easily accessible and identifiable locations. Also provide two multipurpose 2-A:20-B:C portable fire extinguisher on the roof being covered or repaired.

Comply with the following safety procedures:

a. Fuel containers, burners, and related appurtenances of roofing equipment in which liquefied petroleum gas is used for heating must comply with the requirements of NFPA 58.

b. Fuel containers having capacities greater than one pound must be located a minimum of 10 foot clear distance from the burner flame.

c. All LP-Gas Cylinders must be clearly labeled "Flammable Gas", and secured to prevent accidental tip-over.

d. Check all pressure regulators and hoses prior to use for proper functioning and integrity.

e. Turn off fuel supply at LP Gas Cylinder when kettle is not in use.

f. Equip all kettles with a functioning temperature measuring device to ensure no heating in excess of 50 degrees F below the flash point.

g. Provide covers, lids, or tops which are close fitting, constructed of minimum No.14 manufacturer's gauge steel, and can be gravity closed on all kettles.

h. Clean all roofing mops and rags free of excess asphalt and store safely away from all combustible materials. Store discarded roofing mops and rags in a non-combustible container and remove from site each day.

i. Position all pump lines handling hot asphalt securely and equip all pump lines with a shut-off valve on each with a coupler which may be opened when lines are full. Do not subject pump lines to pressures in excess of safe and recommended NRCA and ARMA working pressures. Station an operator near the equipment to cut off flow and care for other emergencies while conducting heating, pumping and application operations.

j. Asphalt/tar bucket used by roofers or workers in similar trades must be constructed of minimum No. 24 gauge or heavier sheet steel and have a metal bail of no less than 1/4 inch diameter material. The bail is to be fastened to offset ears or equivalent which have been riveted, welded, or otherwise safely and securely attached to the bucket. Soldered bail sockets are prohibited. Position workers and other employees to avoid being struck by bucket or other roofing materials, which may accidentally fall while being hoisted, lowered, or used in the roofing operation. Provide safety barriers and caution signs at all skylights or other roof holes.

k. Do not use flammable liquids with a flash point below 100 degrees F (gasoline and similar products) for cleaning purposes.

Do not use solid fuel or Class I liquids as fuel for roofing asphalt/tar kettles. Provide a minimum of one employee fully knowledgeable of kettle operations and hazards to maintain constant surveillance during kettle operation within a minimum distance of 25 foot of the kettle.

Check all fire extinguishers prior to commencement of work, and upon completion of the day's work, to ensure fullness and operability.

Project supervisor must make daily inspections with the facility manager of all conditions and operations which could present hazards during torchin g and hot-mopped applications and issue directives to address all such concerns and items of the work and existing conditions.

Identify and protect all combustible roof components, possible fire traps, and hidden hazards. Seal off voids or openings in the substrate with non-combustible materials prior to installing torch-applied and hot-mopped applied materials in the area. Install protective fire retardant blankets and shields at building walls, eaves, parapets and equipments curbs constructed of combustible materials within 3 foot radius of the area of torch work and hot-mopped kettle prior to commencement of the work.

When working around intakes and openings, temporarily disconnect and block to prevent flame of torch and fumes from kettle from being drawn into the opening. Provide non-combustible shielding or flame guard protection where gaps or voids occur in the construction in area of torch work.

1.8.2 Fire Watch

All personnel on the roof during torch application and hot-mopped application must be properly trained to use a fire extinguisher. Provide a fire watch for a minimum of two hours after completion of all torch work and 30 minutes after completion of hot-mopped kettle operations at the end of each work shift. Maintain the fire watch for additional time required to ensure no potential ignition conditions exist. Utilize heat sensing meters to scan for hot spots in the work.For torch applications, provide and utilize a minimum of one certified heat detection gun per torch for use during the fire watch to verify cool, safe and non-combustible conditions exist. Provide a minimum duration fire watch of two hours conducted by personnel properly trained to survey the underside of the roof deck (where possible) and the topside of possible smoldering elements.

Do not torch in areas of poor and/or no visibility (curbs, corners, eaves, expansions joints, flashing, other voids and small penetrations) which could allow a torch flame to ignite combustible material(s) hidden from view or within the underside of the roof deck or building interior. Use cold finish applications in these areas whenever possible and per manufacturer's printed instructions, NRCA 4002, MRCA R&NW manual for "cold adhered" materials.

Do not leave the rooftop unattended during breaks in work during a work shift. Walk and scan all areas of application checking for hot spots, fumes, or smoldering, especially at wall and curb areas, prior to departure at the end of each work shift. Ensure any and all suspect conditions are eliminated prior to leaving the site each work shift.

1.8.3 Open Flame Application (Torch) Equipment and Personnel Safety

Only NRCA/MRCA CERTA certified roofing applicators are allowed to operate any torching equipment. Verify that all such applicators maintain and are currently carrying a valid Certified Roofing Torch Applicator (CERTA) card.

All crew members must be trained in preventive measures for indirect and direct dangers and hazards associated with roofing work, which include, but are not limited to the following:

a. Heat Stress: Wear light colored clothing, a hat for ultra-violet protection, and other eye protective devices. Drink sufficient quantities of non-alcoholic, non-caffeine liquids. Stage shifts for crew members to allow for breaks from heat and sun exposure without interfering with work progress.

b. First Aid for Burns: Immediately call for an ambulance. Contact local Occupational Health Services (OHS).

All crew members must wear correct personal protective equipment (PPE), including, but not limited to the following items:

a. Long-sleeved shirts buttoned at the collar and cuffs,and must be made of non-flammable materials. Polyester materials are not allowed.

b. Work boots covering ankles with rubber or composite soles.

c. Long pants without cuffs to extend over the top of the work boots, and must be made of non-flammable materials. No polyester allowed.

d. Heavy leather gloves and/or flame retardant gauntlets which must be worn during all handling of a torch, whether operating or not.

e. OSHA and ASSE/SAFE Z87.1 approved face shields, goggles and/or safety glasses to be worn during torching and any other applicable roofing functions.

f. OSHA and ANSI approved hard hats.

1.8.4 Wind Conditions

Use side shields with all torching operations when winds are occurring to prevent flame distortion of end burners. Use torch machine equipment with bottom shield plate to prevent flame spread on to roof deck and substrate. When high wind gusts are present, notify the safety officer and cease all use of torching equipment until wind conditions lower and authorization from the safety officer to proceed is received.

1.9 SEQUENCING

Coordinate the work with other trades to ensure that components which are to be secured to or stripped into the roofing system are available and that permanent flashing and counter flashing, per NRCA Details, and are installed as the work progresses. Ensure temporary protection measures are in place to preclude moisture intrusion or damage to installed materials. Application of roofing must immediately follow application of insulation as a continuous operation. Coordinate roofing operations with insulation work so that all roof insulation applied each day is covered with roof membrane installation the same day.

1.10 WARRANTY

Provide roof system material and workmanship warranties meeting specified

requirements. Provide revision or amendment to standard membrane manufacturer warranty to comply with the specified requirements.

1.10.1 Roof Membrane Manufacturer Warranty

Furnish the roof membrane manufacturer's 20 year no dollar limit (NDL) roof system materials and installation workmanship warranty, including flashing, insulation, and accessories necessary for watertight roof system construction. Write the warranty directly to the Government commencing at the time of Government's acceptance of the roof work. Provide the following statement for such warranty:

a. If within the warranty period the roof system, as installed for its intended use in the normal climatic and environmental conditions of the facility, becomes non-watertight, shows evidence of moisture intrusion within the assembly, blisters, splits, tears, delaminates, separates at the seams, or shows evidence of excessive weathering due to defective materials or installation workmanship, the repair or replacement of the defective and damaged materials of the roof system assembly and correction of defective workmanship are the responsibility of the roof membrane manufacturer. All costs associated with the repair or replacement work are the responsibility of the roof membrane manufacturer.

b. When the manufacturer or his approved applicator fail to perform the repairs within 72 hours of notification, emergency temporary repairs performed by others does not void the warranty.

c. Damage to the roofing system caused by sustained winds having a velocity of 110 mph or
less is covered by the warranty.

d. Upon completion of installation, and acceptance by the Contracting Officer and Roofing System Engineer of Record, the manufacturer must supply the appropriate warranty to the Government (Owner).

e. Installer must submit a minimum five year warranty to the membrane manufacturer from the date of acceptance, with a copy to the Contracting Officer and Roofing System Engineer of Record.

1.10.2 Roofing System Applicator/Installer Warranty

The roof system Applicator/Installer must warrant for a minimum period of five years that the roof system, as applied/installed, is free from defects in application/installation workmanship, to include the roof membrane, flashing, insulation, fasteners, cover boards, substrate board, vapor retarder, roof pavers, walkway products, accessories, attachments, and sheet metal installation integral to a complete watertight roof system assembly. Write the warranty directly to the Government. Write the warranty, on the form at end of this Section, signed by roofing Applicator/Installer, properly executed and printed on Applicator's/Installer's letterhead form, directly to the Government commencing at the time of Government's acceptance of the roof work. The roof system applicator/installer is responsible for correction of defective workmanship and replacement of damaged or affected materials. The roof system applicator/installer is responsible for all costs associated with the repair or replacement work.

1.10.3 Continuance of Warranty

Repair or replacement work, ARMA 410BUR88, ARMA 460LSR97 that becomes necessary within the warranty period must be approved, as required, and accomplished in a manner so as to restore the integrity of the roof system assembly and validity of the roof membrane manufacturer warranty for the remainder of the manufacturer warranty period.

1.11 CONFORMANCE AND COMPATIBILITY

The entire roofing and flashing system must be in accordance with specified and indicated requirements, including fire and wind resistance ANSI/SPRI ES-1 requirements. Work not specifically addressed, and any deviation from specified requirements, must be in general in accordance with recommendations of the NRCA Roofing and Waterproofing Manual, membrane manufacturer published recommendations and details, and compatible with surrounding components and construction. Submit any deviation from specified or indicated requirements to the Contracting Officer for approval prior to installation.

1.12 DESCRIPTION OF ROOF MEMBRANE SYSTEMS

Minimum two-ply SBS modified bitumen roof membrane consisting of SBS modified bitumen base ply and cap sheet. SBS modified bitumen base ply shall be set in hot asphalt, and cap sheet shall be torch applied.

All work must follow the NRCA 0405 guidelines and standards stated within this Section.

PART 2 PRODUCTS

2.1 GENERAL

Furnish a combination of specified materials that comprise the membrane manufacturer's standard system of the number and type of plies specified. Materials provided must be approved by the roof membrane manufacturer and suitable for the service and climatic conditions of the application/installation.

Listed in this section are specifications for materials required generally for use in accomplishing the work specified. Materials not listed may also be required.

Except as specifically noted herein, all reference standards included herein are presumed to be the latest published editions of such standards available as of the issue date of these specifications.

Brand or manufacturer names are used as standards of quality where no other appropriate reference is available. Submit substitution requests under requirements listed in other Sections.

Where a generic product or a general manufacturer's product is specified and more than one such product is offered by the manufacturer, provide the manufacturer's premium materials.

LEED/EPA Requirements (on new construction and where required by local codes):

1. Roofing shall qualify for Leadership in Energy and Environmental Design (LEED) certification points as defined by the United States Green Building Council (USGBC).

2. Roofing shall comply with the requirements of the U.S. EPA Energy Star® program and meet the reflectance and emittance requirements of Title 24 Part 6 for the state of California. Contractor shall submit CRRC Product ID number.

2.2 MANUFACTURERS

For purposes of these documents, the roof system manufacturer is defined as the manufacturer of the primary roof membrane. The roof system is intended to encompass, but is not necessarily limited to, all components above the deck including underlayment and/or vapor retarder components, roof insulation, roof membrane, membrane flashings and any proprietary flashing/components of the system manufacturer. Subject to compliance with the material specifications of these documents, all materials are to be supplied by the same manufacturer.

All materials used in systems to be covered by a Manufacturer's Guarantee must be supplied by the same manufacturer, unless the manufacturer issuing the guarantee waives this requirement in writing.

The following material manufacturers are approved for this project. Such approval does not relieve the Contractor from the requirement to supply materials which meet all other requirements of these Specifications.

1. Siplast, Inc.

2. Johns Manville International, Inc.

3. Soprema, Inc.

2.3 BASE SHEET MATERIALS

Furnish a combination of specified materials that comprise the modified bitumen manufacturer's standard system of the number and type of plies specified. Materials provided must be suitable for the service and climatic conditions of the installation. Modified bitumen sheets must be watertight and visually free of pinholes, particles of foreign matter, non-dispersed raw material, factory splices, or other conditions that might affect serviceability. Polymer modifier must comply with ARMA PMBRG98 and be uniformly dispersed throughout the sheet. Edges of sheet must be straight and flat.

a. Slip Sheet: Building paper, 3 lbs/100 square feet, rosin-sized.

b. Fiberglass Felt Base Sheet: ASTM D 4601,ASTM D 1668, Type II, unperforated, asphalt-impregnated and coated, glass-fiber sheet, dusted with mineral surfacing on both sides.

2.4 MEMBRANE MATERIALS

Base Ply: ASTM D 5147 and ASTM D 6163 and/or ASTM D 6164, Type II, Grade S, SBS-modified asphalt sheet with glass fiberand/or polyester mat reinforcing, suitable for application method specified.

Cap Sheet: ASTM D 5147 and ASTM D 6163 and/or ASTM D 6164, Type II, Grade G, SBS-modified asphalt sheet with glass fiberand/or polyester mat reinforcing, granular surfaced, suitable for application method specified. Granule Color: White.

Cap Ply Flashing Sheet: ASTM D 6298, glass fiber reinforced, SBS-modified asphalt sheet; granule surfaced, suitable for torch application.

Base Ply Flashing Sheet: ASTM D 5147 and ASTM D 6163 and/or ASTM D 6164, Type II, Grade S, SBS-modified asphalt sheet with glass fiberand/or polyester mat reinforcing, suitable for hot asphalt or flashing cement application. 2.5 Fluid Applied Flashing System

Shall be membrane manufacturer's PMMA based resin with polyester fleece flashing system.

2.6 BITUMINOUS MATERIALS

Asphalt Primer: ASTM D 41.

Asphalt Roof Cement: ASTM D 4586, Type II, asbestos-free.

Roofing Asphalt: ASTM D 312, Type IV, extra-steep grade.

2.7 INSULATION / BOARD GOODS

Perlite Board: Rigid perlite roof insulation conforming to ASTM C 728, Type III. Board Size shall be 2' by 4' and thickness shall be 1/2".

Polyisocyanurate Roof Insulation: ASTM C 1289, Type II, Class I, with felt or glass-fiber mat on both major surfaces, manufactured to meet the following requirements:

Nominal Compressive Strength: Grade 2 (20 psi).

Dimensional Stability: 2% maximum linear change when conditioned at 158°F and 97% relative humidity.

Minimum Curing Time: 24 hours, plus 24 hours for each inch of thickness at a minimum of 60°F before shipment from manufacturer.

Maximum Board Thickness: 2.5 inches.

Cant Strips: ASTM C 728, mineral perlite cut to fit at 45° with minimum 4-1/2 inch face.

Tapered Edge Strips: ASTM C 208, wood fiberboard, 1-1/2 inch at thick edge.

Insulation Adhesive: Type IV asphalt.

2.8 FASTENERS

Galvanized Steel Roofing Nails: 11 or 12 gauge hot-dipped galvanized steel with ringed shank, minimum 3/8 inch diameter head, minimum 1-1/4-inch length.

Masonry Anchors: Steel screw anchor for use in concrete, brick, or concrete masonry units manufactured with threads for cutting into walls of

pre-drilled opening to provide tight friction fit, 1/4-inch diameter, length to penetrate substrate a minimum of 1-1/2 inch.

Gypsum Base Sheet Fasteners: Shall be galvanized coated steel tube with high-tensile double steel wire locking staple and 2.7" diameter coated steel, ribbed plate; approved by the base sheet manufacturer for the base sheet specified; fastener length shall be as required to and penetrate the deck a minimum of 1.2 inches.

Insulation Fasteners and Plates: Plated steel fastener and 3-inch diameter round or 3-inch square steel plate as manufactured by or specifically recommended by the roof system manufacturer. Fasteners and plates must be Factory Mutual approved for 1-90 construction with the specified insulation.

Termination Bar: Extruded aluminum bar, 1-inch wide, 1/8-inch thick, with pre-punched holes at 6-inches on center.

2.9 PRE-MANUFACTURED ACCESSORIES

Pre-manufactured accessories must be manufacturer's standard for intended purpose, comply with applicable specification section, compatible with the membrane roof system and approved for use by the roof membrane manufacturer.

2.9.1 Walk Pad Material

Shall be a prefabricated (by the membrane manufacturer), puncture resistant polyester core reinforced, polymer modified bitumen sheet material topped with a ceramic granule wearing surface.

PART 3 EXECUTION

3.1 SYSTEM SCHEDULE

3.1.1 Refer to Tables 1 and 2 for a general schedule of the primary roof components (described from the bottom up) for each roof area. Methods of installation and related materials are in other sections of these specifications.

Table 1 USARC (MB)

Area A	Area B	Area C
Gypsum over form board	Concrete decking	Gypsum over form board
Slip sheet, rosin sized	SBS Modified Bitumen Base Ply (Vapor Barrier), set in hot asphalt	Slip sheet, rosin sized
Mechanically attached base sheet	2 inch polyisocyanurate insulation, set in hot asphalt	Mechanically attached base sheet

Area A	Area B	Area C
2 inch polyisocyanurate insulation, set in hot asphalt	2 inch polyisocyanurate insulation, set in hot asphalt	2 inch polyisocyanurate insulation, set in hot asphalt
2 inch polyisocyanurate insulation, set in hot asphalt	1/2" per foot tapered polyisocyanurate insulation	2 inch polyisocyanurate insulation, set in hot asphalt
1/2 inch perlite set in hot asphalt	1/2 inch perlite set in hot asphalt	1/4" per foot tapered polyisocyanurate insulation
SBS Modified Bitumen Base Ply set in hot asphalt	SBS Modified Bitumen Base Ply set in hot asphalt	1/2 inch perlite set in hot asphalt
SBS Modified Bitumen Cap Sheet, torch applied	SBS Modified Bitumen Cap Sheet, torch applied	SBS Modified Bitumen Base Ply set in hot asphalt
		SBS Modified Bitumen Cap Sheet, torch applied

Table 2 OMS

Area F	Area G
Gypsum over form board	Plywood decking
Slip sheet, rosin sized	Slip sheet, rosin sized
Mechanically attached base sheet	Mechanically attached base sheet
2 inch polyisocyanurate insulation, set in hot asphalt	2 inch polyisocyanurate insulation, set in hot asphalt
2 inch polyisocyanurate insulation, set in hot asphalt	2 inch polyisocyanurate insulation, set in hot asphalt
1/2 inch perlite set in hot asphalt	1/2 inch perlite set in hot asphalt
SBS Modified Bitumen Base Ply set in hot asphalt	SBS Modified Bitumen Base Ply set in hot asphalt
SBS Modified Bitumen Cap Sheet, torch applied	SBS Modified Bitumen Cap Sheet, torch applied

3.2 VERIFICATION OF CONDITIONS

Inspect all surfaces to receive work specified herein. Application of materials constitutes approval of the substrate as being satisfactory.

Do not proceed with roofing until all vents, drains, curbs, cants, blocking, nailing strips, and projections through the roof deck have been installed.

Ensure that the following conditions exist prior to application of the roofing materials:

a. Drains, curbs, cants, control joints, expansion joints, perimeter walls, roof penetrating components, and equipment supports are in place.

b. Surfaces are rigid, clean, dry, smooth, and free of cracks, holes, and sharp changes in elevation. Joints in substrate are sealed to prevent drippage of bitumen into building or down exterior walls. Inspect surfaces and approve immediately before application of roofing and flashings. Apply the roofing and flashings to a smooth and firm surface free from ice, frost, visible moisture, dirt, projections, and foreign materials.

c. The plane of the substrate does not vary more than 1/4-inch within an area 10 by 10 feet when checked with a 10 foot straight edge placed anywhere on the substrate.

d. Substrate is sloped as indicated to provide drainage.

e. Walls and vertical surfaces are constructed to receive counterflashing and will permit mechanical fastening of the base flashing materials.

f. Treated wood nailers are in place on non-nailable surfaces, to permit nailing of base flashing at minimum height of 8-inches above finished roofing surface.

g. Protect all combustible materials and surfaces which may contain concealed combustible or flammable materials. All fire extinguishing equipment has been placed as specified.

h. Verify all Fire Watch personnel assignments.

i. Treated wood nailers are fastened in place at eaves, gable ends, openings, and intersections with vertical surfaces for securing of membrane, edging strips, attachment flanges of sheet metal, and roof fixtures. Embedded nailers are flush with deck surfaces. Surface-applied nailers are the same thickness as the roof insulation.

j. Cants are securely fastened in place in the angles formed by walls and other vertical surfaces. The angle of the cant is 45 degrees and the height of the vertical leg is not less than nominal 3-1/2 inches.

l. Exposed nail heads in wood substrates are properly set. Warped and split boards have been replaced. There are no cracks or end

joints 1/4-inch in width or greater. Knot holes are covered with sheet metal and nailed in place. Wood or Plywood decks are covered with rosin paper or unsaturated felt prior to base sheet, insulation or roof membrane application.

m. Insulation boards are installed smoothly and evenly, and are not broken, cracked, or curled. There are no gaps in insulation board joints exceeding 1/4-inch in width. Insulation is being roofed over on the same day the insulation is installed.]

p. Roof deck and framing are sloped as indicated to provide positive drainage.

3.3 INSTALLATION, GENERAL

Do not apply materials on wet or damp surfaces, over dust, dirt or other foreign matter. Foaming of hot bitumen at application is evidence that the surface is too wet for application.

Do not apply bituminous materials when ambient air temperature is below 40°F unless equipment can be operated and materials handled without exceeding maximum allowable temperatures and without damage to materials, and then only with approval of the Contracting Officer.

Do not apply emulsions when ambient air temperature is below 40°F or is expected to be below freezing within 24 hours after application.

Accomplish application of roofing materials so that each area will be complete at the end of each workday.

Protect edges and incomplete flashings against water entry at all times. Remove cutoffs and temporary protection prior to resumption of work.

Prime all concrete, masonry and metal surfaces to receive bituminous materials, using approximately one gallon of primer per 100 square feet of surface. Allow primer to dry thoroughly before application of bituminous materials.

Set insulating board cant strips and tapered edge strips in a generous bed of hot asphalt so that they are tightly adhered to both horizontal and vertical surfaces.

Use hot asphalt for application of vapor barrier, insulation, and base sheet.

Torch apply cap sheet and cap ply flashing membrane.

Apply base ply flashing membrane using hot asphalt or flashing cement.

Keep bitumen in kettles and handling equipment within the following ranges at all times during application.

1. Type III Asphalt: Kettle temperature 500°F max, handling equipment temperature 400-425°F.

2. Type IV Asphalt: Kettle temperature 500°F max, handling equipment temperature 400-475°F.

Provide kettles with accurate working thermometers or provide a hand

thermometer for the kettle operator with instructions for use. When using a hand thermometer, take kettle temperature at farthest point from burner stacks or at draw-off spigot.

If roofing bitumen is supplied with technical data posted on cartons or in a separate document, that data will govern temperature as follows:

1. Kettle temperature will be maintained below flash point (FP).

2. At no time shall kettle temperature be kept at or above final blowing temperature (FBT) for more than two hours.

3. At point of application, asphalt temperature will be the equiviscous temperature (EVT) (at 125 cps) ± 25°F.

Use the following minimum quantities of asphalt:

1. Base Ply 25 lbs./100 sq. ft.

3.4 TORCH OPERATIONS

All torch operations are to comply with Certified Roofing Torch Applicator (CERTA) and NRCA requirements. Torch operators shall be fully certified by CERTA. Contractor shall provide copy of certification for all torch applicators.

1. For a minimum of two hours following daily completion of torch applications, maintain a fire watch inside and outside the building in the area of torch application. Utilize a fully-functional hand-held infrared device suitable for detecting areas of elevated temperature.

2. Contractor shall maintain two (2) fully operational fire extinguishers at the site at all times.

3. Apply two-ply base flashing backer sheet at wood curbs. Take all measures necessary to protect wood curbs from open flames.

4. Contractor shall use "torch-and-flop" method at all base flashings.

3.5 VAPOR BARRIER APPLICATION

Clean concrete deck surfaces of all dirt, dust and other foreign matter. Prime concrete as specified.

Starting at low points in roof, apply one ply of base ply perpendicular to slope, lapped at least 4-inches at sides and 6-inches at ends in hot asphalt.

Set edges of vapor retarder in asphalt roof cement at all roof penetrations.

Flash vapor retarder to all penetrations using the same retarder and adhesive so that moisture cannot penetrate the insulation layer from underneath.

Protect in-place retarder from damage before and during application of insulation. Repair damaged spots with the same retarder and adhesive.

Cement vapor retarder membrane to substrate without voids using steep grade asphalt.

3.6 BASE SHEET APPLICATION

Clean deck surfaces of all dirt, dust and other foreign matter.

Apply next to deck one ply of rosin-sized sheathing paper. Lap sides 4-inches and ends 6-inches. Nail sufficiently to hold in place with appropriate fasteners.

Starting at low points in roof, apply one ply of fiber glass base sheet perpendicular to slope, lapped at least 4-inches at sides and 6-inches at ends.

Fasten base sheet through center of sheet in two staggered rows spaced approximately 12-inches apart and through laps with specified fasteners. Space fasteners as follows:

1. Field of Roof: 9-inches on center at laps, 18-inches on center at intermediate rows. Field of roof is defined as all areas of roof except perimeter, corners.

2. Perimeter: 7-1/2-inches on center at laps, 7-1/2-inches on center at intermediate rows. Perimeter of roof is defined as all exterior edges and is 6-feet wide unless indicated otherwise on Drawings.

3. Corners: 7-1/2-inches on center at laps, 7-1/2-inches on center at intermediate rows. Corners of roof occur at all perimeter locations where changes in direction occur and are 6 feet in size unless indicated otherwise on Drawings.

Keep asphalt back approximately 4-inches from all open deck joints.

Terminate base sheet at face of all vertical surfaces.

3.7 INSULATION APPLICATION

Apply insulation in two or more separate layers cementing each layer to the other in hot asphalt.

Stagger all joints off those of preceding layer.

On metal decks apply insulation with long dimension of units across deck ribs. On open rib steel decks, ends of units must bear on deck surface.

Apply insulation with end joints staggered approximately one-half the length of units.

Apply insulation with joints aligned both directions.

Where insulation is to be adhered to a base sheet and/or other insulation, apply a complete mopping of steep grade asphalt to the substrate. Set insulation into asphalt immediately after application and before chilling prevents complete adhesion.

Ensure full adhesion of all layers of insulation and take whatever steps necessary to achieve full adhesion including, if necessary, temporary ballasting of insulation until asphalt sets.

For multiple layers of insulation, apply adhesive over preceding layers once fully secured and follow procedures, as specified herein, for attachment of each insulation layer.

Fit all insulation units snugly to each other and to all vertical surfaces.

Remove and replace all damaged units with new insulation or repair to provide a smooth surface and uniform insulation thickness.

Set insulation into insulation adhesive immediately after application while adhesive is still soft and tacky.

Fasten with appropriate fasteners through steel plates into deck at the following rates:

1. Field of Roof: Minimum of 8 fasteners per 4 foot x 8 foot board and not less than 2 fasteners for any partial unit. Field of roof is defined as all areas of roof except perimeter and corners.

2. Perimeter: Minimum of 12 fasteners per 4 foot x 8 foot board and not less than 2 fasteners for any partial unit. Perimeter of roof is defined as all exterior edges and is 6-feet wide unless indicated otherwise on Drawings.

3. Corners: Minimum of 18 fasteners per 4 foot x 8 foot board and not less than 2 fasteners for any partial unit. Corners of roof occur at all perimeter locations where changes in direction occur and are to be 6 feet in size unless indicated otherwise on Drawings.

Provide insulation fasteners of lengths sized to engage top flange of metal deck a minimum of 3/4-inches and a maximum of 1-1/2 inches.

Wrap extended edges of base sheet or vapor retarder and cement to edge and top of insulation.

Form tapered insulation system using factory tapered polyisocyanurate insulation units and polyisocyanurate insulation fill units.

Provide a completed slope of 1/2-inch per foot or as indicated on drawings.

Start tapered insulation system at lowest point and increase insulation thickness toward high points. Provide a minimum insulation thickness at low point of 3 inches above the substrate.

Form crickets between drains using factory tapered polyisocyanurate insulation units and polyisocyanurate insulation fill units and tapered edge strips.

Form crickets along the upslope side of all curb-mounted equipment with base widths exceeding 24 inches using factory tapered polyisocyanurate insulation units and polyisocyanurate insulation fill units and tapered edge strips.

Install crickets of sufficient size and slope as required to ensure complete drainage and prevent standing water. Fabricate full crickets between drains with a minimum width-to-length ratio of 0.5 . Fabricate partial crickets with dimensions which would result in a minimum

width-to-length ratio of 0.5 if they were extended to full size.

Fabricate crickets sufficiently wide as to result in valleys with positive slopes of not less than 1/16-inch per foot.

Unless noted otherwise, fabricate all crickets from tapered stock as required to provide an installed slope matching that of the adjacent roof area. For example, where the roof slope is 1/4-inch per foot, fabricate crickets from 1/2-inch per foot stock to provide an installed slope of 1/4-inch per foot.

Start cricket construction by striking chalk lines for outer edges of tapered edge strips. Install edge strips along chalk lines, mitering and fitting at the points where lines break.

Complete the cricket assembly using polyisocyanurate insulation units and polyisocyanurate insulation fill units.

Provide an insulation thickness at eaves as required to maintain gravel stop-fascia at uniform elevation and with uniform face widths. Install additional tapered edge strips at eaves, etc. as required to meet this requirement.

Build crickets over the tapered insulation. Take special care to prevent water penetration into crickets during construction.

Taper insulation down to drains beginning at a point approximately 24 -inches from drain.

Form sumps at drains using wood fiberboard tapered edge strips, and factory tapered insulation units as needed.

3.8 MEMBRANE APPLICATION

Apply new cold adhesive grade SBS modified bitumen material in strict accordance with manufacturer's latest printed instructions except as amended in this section.

Lap ends at least 6-inches and sides at least 4-inches.

Stagger end laps a minimum of 3-feet.

Cut base ply and cap sheet in strips not over 18-feet long, lay flat and allow all strips to flatten completely before using. Do not use damaged, abused or distorted roll ends.

Where stripping plies are specified, they are to be installed prior to application of cap sheet. Where base flashings are specified, terminate cap sheet neatly along top of cant and apply base flashing over cap sheet.

Check roof surface carefully for damage and application defects and make appropriate repairs and corrections.

Starting at low point in roof, apply base ply. Apply uniformly and without voids. Press into full contact with substrate.

Starting at low point in roof, apply cap sheet. Apply uniformly and without voids. Press into full contact with substrate.

Stagger side laps of base ply and cap sheet.

Install in all adhesive over-runs roofing granules matching the cap sheet surface. Finished surfaces must be reasonably uniform without streaks or spots.

Take measures as required to ensure that base ply and cap ply are fully adhered.

3.9 BASE FLASHING APPLICATION

Install torch grade modified bitumen flashings at all curbs, walls and vertical surfaces where other types of flashings are not specified or shown on Drawings.

Prior to application of base flashings, carefully inspect membrane plies and all surfaces to which flashings are to be applied. Clean surfaces of dust, dirt or any residue which may interfere with application or adhesion of flashings. Ensure that all plies are solidly adhered to each other and to the cant and the cant is solidly affixed to horizontal and vertical surfaces. Base flashings must be tight and fully bonded to the substrate. Loose spots, loose laps or blisters are not acceptable.

Prior to installation of base flashings at plywood substrates, furnish and install new rosin sized sheathing paper and fiber glass base sheet. Lap ends of base sheet 4-inches. Secure using specified fasteners spaced 6 inches on center in both directions.

Carefully remove all deleterious amounts of bituminous cements.

Apply new torch grade modified bitumen base flashing material in strict accordance with manufacturer's latest printed instructions except as amended herein.

Where required by manufacturer, apply an underlying strip of fiber glass felt in cold adhesive without voids extending at least 4-inches on the roof, up face of cant and up vertical surface at least 4-inches.

Secure top of base flashings with termination bar fastened 6-inches on center. Use ringshank nails with 1-inch washer at wood substrates. At masonry or concrete substrates, use drive pins with manufacturer-supplied sealing washers.

At wood substrates, fasten top of flashing with specified fasteners on a line approximately 1-inch below top edge and spaced not over 4-inches on center.

At masonry substrates, fasten top of flashing with specified fasteners through continuous termination bar on a line approximately 1-inch below top edge and spaced not over 8-inches on center.

Immediately thereafter, trowel top edge and fasteners with a continuous 1/8-inch thick coating of flashing cement.

Check all laps as required by the manufacturer's specifications. Reheat and seal as required to obtain full adhesion.

Unless specifically stated otherwise in these specifications or on Drawings, all base flashings are required to extend a minimum of 8-inches

above finished roof level. Include costs for modifying parapets, equipment curbs, expansion joint curbs, etc. to meet this requirement.

3.10 FLUID APPLIED FLASHING INSTALLATION

Manufacturer's liquid-applied, reinforced flashing systems shall be installed where conditions are not favorable to install SBS modified bitumen flashings. Such conditions include irregular shapes penetrating roof surfaces (I-beams), confined areas and low flashing heights. Manufacturer's liquid-applied, reinforced flashing systems shall be used in lieu of pitch pans and lead pipe flashings.

Using masking tape, mask the perimeter of the area to receive the flashing system. Apply resin primer to substrates requiring additional preparation and allow primer to set.

Pre-cut fleece to ensure a proper fit at transitions and corners prior to membrane application.

Refer to manufacturer's installation instructions for application rates and additional installation information.

Broadcast granules into horizontal surface of fluid to match adjacent surface ply.

3.11 STRIPPING APPLICATION

Strip flange of edge metal with one ply of base ply material in accordance with membrane manufacturer's latest printed instructions. Fit stripping snugly to lip of edge metal. Use 9-inch wide stripping.

Strip flange of roof vent with two plies of base ply material in accordance with membrane manufacturer's latest printed instructions. Use 9-inch wide stripping for first ply and 12-inch wide stripping for second ply.

Strip drain lead two plies of base ply material in accordance with membrane manufacturer's latest printed instructions. Extend first ply of stripping a minimum of 12-inches beyond lead. Extend second ply a minimum of 6-inches beyond the first.

Torch-apply cap sheet modified bitumen flashing over base ply stripping at drains. All cuts and terminations at mineral surfaced cap sheets are to be neat and square.

3.12 WALKWAY APPLICATION

Install new walkway at all locations indicated on Drawings as specified herein.

Install new walkway on all sides of all major equipment (motorized equipment, scuttles, or any rooftop unit with any single dimension greater than 4 feet).

Adhere walkway units by setting in cold adhesive over cap sheet surface.

Cut strips of walkway units for installation under conduit supports from new full-size walkway units. Cut strips a minimum of 6-inches wider and longer than conduit supports to be supported.

Cut strips of walkway units for installation under conduit supports from new full-size walkway units. Cut strips a minimum of 6-inches wider and longer than base of conduit support to be supported.

Set units so that long edges are aligned and units are spaced about 2-inches apart.

-- End of Section --

PRIME CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM

FACILITY DESCRIPTION_____

BUILDING NUMBER:_____

CORPS OF ENGINEERS CONTRACT NUMBER:_____

CONTRACTOR

CONTRACTOR:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

OWNER

OWNER:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

CONSTRUCTION AGENT

CONSTRUCTION AGENT:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

PRIME CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM
(continued)

THE SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM INSTALLED ON THE ABOVE NAMED BUILDING IS WARRANTED BY _____ FOR A PERIOD OF FIVE (5) YEARS AGAINST WORKMANSHIP AND MATERIAL DEFICIENCIES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE. THE ROOFING SYSTEM COVERED UNDER THIS WARRANTY SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING: BOARD GOODS, VAPOR RETARDER, INSULATION, BASE SHEETS, FELTS, FLASHING, BITUMINOUS MATERIALS, AGGREGATE SURFACING, FASTENERS, ADHESIVES, CONNECTORS, ROOF SECUREMENT COMPONENTS, TRIM, AND ALL MISCELLANEOUS COMPONENTS AND ACCESSORIES SUPPLIED BY THE MANUFACTURER (EITHER DIRECTLY OR THROUGH HIS SUBCONTRACTOR). THIS INCLUDES ROOF PENETRATION ITEMS SUCH AS VENTS, CURBS, SKYLIGHTS; INTERIOR OR EXTERIOR GUTTERS AND DOWNSPOUTS AND OTHER ROOF SYSTEM FLASHINGS INSTALLED AND ANY OTHER COMPONENTS SPECIFIED WITHIN THIS CONTRACT TO PROVIDE A WEATHERTIGHT ROOF SYSTEM; AND ITEMS SPECIFIED IN OTHER SECTIONS OF THE SPECIFICATIONS THAT ARE PART OF THE SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM.

ALL MATERIAL DEFICIENCIES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE ASSOCIATED WITH THE ROOFING SYSTEM COVERED UNDER THIS WARRANTY SHALL BE REPAIRED AS APPROVED BY THE CONTRACTING OFFICER. THIS WARRANTY SHALL COVER THE ENTIRE COST OF REPAIR OR REPLACEMENT, INCLUDING ALL MATERIAL, LABOR, AND RELATED MARKUPS. THE ABOVE REFERENCED WARRANTY COMMENCED ON THE DATE OF FINAL ACCEPTANCE ON _____ AND WILL REMAIN IN EFFECT FOR STATED DURATION FROM THIS DATE.

SIGNED, DATED, AND NOTARIZED (BY COMPANY PRESIDENT)

_____

(Company President) (Date)

PRIME CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM
(continued)

THE CONTRACTOR SHALL SUPPLEMENT THIS WARRANTY WITH WRITTEN WARRANTIES FROM THE MANUFACTURER AND/OR INSTALLER OF THE ROOFING SYSTEM, WHICH SHALL BE SUBMITTED ALONG WITH THE CONTRACTOR'S WARRANTY. HOWEVER, THE PRIME CONTRACTOR WILL BE ULTIMATELY RESPONSIBLE FOR THIS WARRANTY AS OUTLINED IN THE SPECIFICATIONS AND AS INDICATED IN THIS WARRANTY EXAMPLE.

EXCLUSIONS FROM COVERAGE

1. NATURAL DISASTERS, ACTS OF GOD (LIGHTNING, FIRE, EXPLOSIONS, SUSTAINED WIND FORCES IN EXCESS OF THE DESIGN CRITERIA, EARTHQUAKES, AND HAIL).

2. ACTS OF NEGLIGENCE OR ABUSE OR MISUSE BY GOVERNMENT OR OTHER PERSONNEL, INCLUDING ACCIDENTS, VANDALISM, CIVIL DISOBEDIENCE, WAR, OR DAMAGE CAUSED BY FALLING OBJECTS.

3. DAMAGE BY STRUCTURAL FAILURE, SETTLEMENT, MOVEMENT, DISTORTION, WARPAGE, OR DISPLACEMENT OF THE BUILDING STRUCTURE OR ALTERATIONS MADE TO THE BUILDING.

4. CORROSION CAUSED BY EXPOSURE TO CORROSIVE CHEMICALS, ASH OR FUMES GENERATED OR RELEASED INSIDE OR OUTSIDE THE BUILDING FROM CHEMICAL PLANTS, FOUNDRIES, PLATING WORKS, KILNS, FERTILIZER FACTORIES, PAPER PLANTS, AND THE LIKE.

5. FAILURE OF ANY PART OF THE ROOFING SYSTEM DUE TO ACTIONS BY THE OWNER TO INHIBIT FREE DRAINAGE OF WATER FROM THE ROOF AND GUTTERS AND DOWNSPOUTS OR ALLOW PONDING WATER TO COLLECT ON THE ROOF SURFACE. CONTRACTOR'S DESIGN SHALL INSURE FREE DRAINAGE FROM THE ROOF AND NOT ALLOW PONDING WATER.

6. THIS WARRANTY APPLIES TO THE SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM. IT DOES NOT INCLUDE ANY CONSEQUENTIAL DAMAGE TO THE BUILDING INTERIOR OR CONTENTS WHICH IS COVERED BY THE WARRANTY OF CONSTRUCTION CLAUSE INCLUDED IN THIS CONTRACT.

7. THIS WARRANTY IS TRANSFERABLE TO ANOTHER OWNER WITHOUT WRITTEN CONSENT OF THE CONTRACTOR; AND THIS WARRANTY AND THE CONTRACT PROVISIONS WILL TAKE PRECEDENCE OVER ANY CONFLICTS WITH STATE STATUTES.

**

PRIME CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM
(continued)

**REPORTS OF LEAKS AND ROOF SYSTEM DEFICIENCIES SHALL BE RESPONDED TO WITHIN 48 HOURS OF RECEIPT OF NOTICE, BY TELEPHONE OR IN WRITING, FROM EITHER THE OWNER OR CONTRACTING OFFICER. EMERGENCY REPAIRS TO PREVENT FURTHER ROOF LEAKS SHALL BE INITIATED IMMEDIATELY; A WRITTEN PLAN SHALL BE SUBMITTED FOR APPROVAL TO REPAIR OR REPLACE THIS ROOF SYSTEM WITHIN SEVEN (7) CALENDAR DAYS. ACTUAL WORK FOR PERMANENT REPAIRS OR REPLACEMENT SHALL BE STARTED WITHIN 30 DAYS AFTER RECEIPT OF NOTICE, AND COMPLETED WITHIN A REASONABLE TIME FRAME. IF THE CONTRACTOR FAILS TO ADEQUATELY RESPOND TO THE WARRANTY PROVISIONS, AS STATED IN THE CONTRACT AND AS CONTAINED HEREIN, THE CONTRACTING OFFICER MAY HAVE THE SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM REPAIRED OR REPLACED BY OTHERS AND CHARGE THE COST TO THE CONTRACTOR.

IN THE EVENT THE CONTRACTOR DISPUTES THE EXISTENCE OF A WARRANTABLE DEFECT, THE CONTRACTOR MAY CHALLENGE THE OWNER'S DEMAND FOR REPAIRS AND/OR REPLACEMENT DIRECTED BY THE OWNER OR CONTRACTING OFFICER EITHER BY REQUESTING A CONTRACTING OFFICER'S DECISION UNDER THE CONTRACT DISPUTES ACT, OR BY REQUESTING THAT AN ARBITRATOR RESOLVE THE ISSUE. THE REQUEST FOR AN ARBITRATOR MUST BE MADE WITHIN 48 HOURS OF BEING NOTIFIED OF THE DISPUTED DEFECTS. UPON BEING INVOKED, THE PARTIES SHALL, WITHIN TEN (10) DAYS, JOINTLY REQUEST A LIST OF FIVE (5) ARBITRATORS FROM THE FEDERAL MEDIATION AND CONCILIATION SERVICE. THE PARTIES SHALL CONFER WITHIN TEN (10) DAYS AFTER RECEIPT OF THE LIST TO SEEK AGREEMENT ON AN ARBITRATOR. IF THE PARTIES CANNOT AGREE ON AN ARBITRATOR, THE CONTRACTING OFFICER AND THE PRESIDENT OF THE CONTRACTOR'S COMPANY WILL STRIKE ONE (1) NAME FROM THE LIST ALTERNATIVELY UNTIL ONE (1) NAME REMAINS. THE REMAINING PERSON SHALL BE THE DULY SELECTED ARBITRATOR. THE COSTS OF THE ARBITRATION, INCLUDING THE ARBITRATOR'S FEE AND EXPENSES, COURT REPORTER, COURTROOM OR SITE SELECTED, ETC., SHALL BE BORNE EQUALLY BETWEEN THE PARTIES. EITHER PARTY DESIRING A COPY OF THE TRANSCRIPT SHALL PAY FOR THE TRANSCRIPT. A HEARING WILL BE HELD AS SOON AS THE PARTIES CAN MUTUALLY AGREE. A WRITTEN ARBITRATOR'S DECISION WILL BE REQUESTED NOT LATER THAN 30 DAYS FOLLOWING THE HEARING. THE DECISION OF THE ARBITRATOR WILL NOT BE BINDING; HOWEVER, IT WILL BE ADMISSIBLE IN ANY SUBSEQUENT APPEAL UNDER THE CONTRACT DISPUTES ACT.

A FRAMED COPY OF THIS WARRANTY SHALL BE POSTED IN THE MECHANICAL ROOM OR OTHER APPROVED LOCATION DURING THE ENTIRE WARRANTY PERIOD.

MANUFACTURER'S NO PENAL SUM WARRANTY
FOR
SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM

FACILITY DESCRIPTION_____

BUILDING NUMBER:_____

CORPS OF ENGINEERS CONTRACT NUMBER:_____

CONTRACTOR

CONTRACTOR:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

OWNER

OWNER:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

CONSTRUCTION AGENT

CONSTRUCTION AGENT:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

MANUFACTURER'S NO PENAL SUM WARRANTY
FOR
SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM
(continued)

THE SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM INSTALLED ON THE ABOVE NAMED BUILDING IS WARRANTED BY _____ FOR A PERIOD OF TWENTY (20) YEARS AGAINST WORKMANSHIP AND MATERIAL DEFICIENCIES. ROOFING SYSTEM COMPONENTS COVERED UNDER THIS WARRANTY SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING: BOARD GOODS, VAPOR RETARDER, INSULATION, BASE SHEETS, FELTS, FLASHING, BITUMINOUS MATERIALS, AGGREGATE SURFACING, FASTENERS, ADHESIVES, CONNECTORS, ROOF SECUREMENT COMPONENTS, TRIM, AND ALL MISCELLANEOUS COMPONENTS AND ACCESSORIES SUPPLIED BY THE MANUFACTURER (EITHER DIRECTLY OR THROUGH HIS SUBCONTRACTOR).

ALL MANUFACTURED MATERIAL DEFICIENCIES, ASSOCIATED WITH THE ROOFING SYSTEM COVERED UNDER THIS WARRANTY SHALL BE REMOVED AND REPLACED AS APPROVED BY THE CONTRACTING OFFICER. THIS WARRANTY SHALL COVER THE ENTIRE COST OF REMOVAL AND REPLACEMENT, INCLUDING ALL MATERIAL, LABOR, AND RELATED MARKUPS. THE ABOVE REFERENCED WARRANTY COMMENCED ON THE DATE OF FINAL ACCEPTANCE ON _____ AND WILL REMAIN IN EFFECT FOR STATED DURATION FROM THIS DATE.

SIGNED, DATED, AND NOTARIZED (BY COMPANY PRESIDENT)

_____

(Company President) (Date)

MANUFACTURER'S NO PENAL SUM WARRANTY
FOR
SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM
(continued)

THE MANUFACTURER SHALL SUPPLEMENT THIS WARRANTY WITH WRITTEN WARRANTIES FROM THE CONTRACTOR AND/OR INSTALLER OF THE ROOFING SYSTEM, WHICH SHALL BE SUBMITTED ALONG WITH THE CONTRACTOR'S WARRANTY. HOWEVER, THE MANUFACTURER WILL BE ULTIMATELY RESPONSIBLE FOR THIS WARRANTY AS OUTLINED IN THE SPECIFICATIONS AND AS INDICATED IN THIS WARRANTY EXAMPLE.

EXCLUSIONS FROM COVERAGE

1. NATURAL DISASTERS, ACTS OF GOD (LIGHTNING, FIRE, EXPLOSIONS, SUSTAINED WIND FORCES IN EXCESS OF THE DESIGN CRITERIA, EARTHQUAKES, AND HAIL).

2. ACTS OF NEGLIGENCE OR ABUSE OR MISUSE BY GOVERNMENT OR OTHER PERSONNEL, INCLUDING ACCIDENTS, VANDALISM, CIVIL DISOBEDIENCE, WAR, OR DAMAGE CAUSED BY FALLING OBJECTS.

3. DAMAGE BY STRUCTURAL FAILURE, SETTLEMENT, MOVEMENT, DISTORTION, WARPAGE, OR DISPLACEMENT OF THE BUILDING STRUCTURE OR ALTERATIONS MADE TO THE BUILDING.

4. CORROSION CAUSED BY EXPOSURE TO CORROSIVE CHEMICALS, ASH OR FUMES GENERATED OR RELEASED INSIDE OR OUTSIDE THE BUILDING FROM CHEMICAL PLANTS, FOUNDRIES, PLATING WORKS, KILNS, FERTILIZER FACTORIES, PAPER PLANTS, AND THE LIKE.

5. FAILURE OF ANY PART OF THE ROOFING SYSTEM DUE TO ACTIONS BY THE OWNER TO INHIBIT FREE DRAINAGE OF WATER FROM THE ROOF AND GUTTERS AND DOWNSPOUTS OR ALLOW PONDING WATER TO COLLECT ON THE ROOF SURFACE. CONTRACTOR'S DESIGN SHALL INSURE FREE DRAINAGE FROM THE ROOF AND NOT ALLOW PONDING WATER.

6. THIS WARRANTY APPLIES TO THE SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM. IT DOES NOT INCLUDE ANY CONSEQUENTIAL DAMAGE TO THE BUILDING INTERIOR OR CONTENTS WHICH IS COVERED BY THE WARRANTY OF CONSTRUCTION CLAUSE INCLUDED IN THIS CONTRACT.

7. THIS WARRANTY IS TRANSFERABLE TO ANOTHER OWNER WITHOUT WRITTEN CONSENT OF THE CONTRACTOR; AND THIS WARRANTY AND THE CONTRACT PROVISIONS WILL TAKE PRECEDENCE OVER ANY CONFLICTS WITH STATE STATUTES.

**

MANUFACTURER'S NO PENAL SUM WARRANTY
FOR
SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM
(continued)

**THE MANUFACTURER SHALL COORDINATE A SITE VISIT WITHIN TEN (10) WORKING DAYS AFTER RECEIVING WRITTEN NOTIFICATION FROM THE CONTRACTING OFFICER. WITHIN FIVE (5) WORKING DAYS FOLLOWING THE SITE VISIT THE MANUFACTURER SHALL SUBMIT A WRITTEN REPORT OUTLINING REMEDIAL PROCEDURES WITH A TIMELINE FOR REMOVAL AND REPLACEMENT OF THE DEFICIENCIES. THIS REPORT SHALL BE REVIEWED AND APPROVED BY THE CONTRACTING OFFICER. AGREED UPON CORRECTIONS TO THE REPORT AND TIMELINE FOR REMEDIATION, BETWEEN THE CONTRACTING OFFICER AND THE MANUFACTURER, SHALL BE RESUBMITTED BY THE MANUFACTURER WITHIN FIVE (5) WORKING DAYS. ACTUAL WORK FOR PERMANENT REPLACEMENT SHALL BE NEGOTIATED BETWEEN THE CONTRACTING OFFICER AND THE MANUFACTURER, AND COMPLETED WITHIN A REASONABLE TIME FRAME. IF THE MANUFACTURER FAILS TO ADEQUATELY RESPOND TO THE WARRANTY PROVISIONS, AS STATED IN THE CONTRACT AND AS CONTAINED HEREIN, THE CONTRACTING OFFICER MAY HAVE THE DEFICIENCIES SATISFIED BY OTHERS AND CHARGE THE COST TO THE CONTRACTOR.

IN THE EVENT THE MANUFACTURER DISPUTES THE EXISTENCE OF A WARRANTABLE DEFECT, HE MAY CHALLENGE THE CONTRACTING OFFICER'S DEMAND FOR REMEDIATION BY REQUESTING THAT AN ARBITRATOR RESOLVE THE ISSUE. THE REQUEST FOR AN ARBITRATOR MUST BE MADE WITHIN 48 HOURS OF BEING NOTIFIED OF THE DISPUTED DEFECTS. UPON BEING INVOKED, THE PARTIES SHALL, WITHIN TEN (10) WORKING DAYS, JOINTLY REQUEST A LIST OF FIVE (5) ARBITRATORS FROM THE FEDERAL MEDIATION AND CONCILIATION SERVICE. THE PARTIES SHALL CONFER WITHIN TEN (10) WORKING DAYS AFTER RECEIPT OF THE LIST TO SEEK AGREEMENT ON AN ARBITRATOR. IF THE PARTIES CANNOT AGREE ON AN ARBITRATOR, THE CONTRACTING OFFICER AND A REPRESENTATIVE FROM THE MANUFACTURER WILL STRIKE ONE (1) NAME FROM THE LIST ALTERNATIVELY UNTIL ONE (1) NAME REMAINS. THE REMAINING PERSON SHALL BE THE DULY SELECTED ARBITRATOR. THE COSTS OF THE ARBITRATION, INCLUDING THE ARBITRATOR'S FEE AND EXPENSES, COURT REPORTER, COURTROOM OR SITE SELECTED, ETC., SHALL BE BORNE EQUALLY BETWEEN THE PARTIES. EITHER PARTY DESIRING A COPY OF THE TRANSCRIPT SHALL PAY FOR THE TRANSCRIPT. A HEARING WILL BE HELD AS SOON AS THE PARTIES CAN MUTUALLY AGREE. A WRITTEN ARBITRATOR'S DECISION WILL BE REQUESTED NOT LATER THAN 30 DAYS FOLLOWING THE HEARING. THE DECISION OF THE ARBITRATOR WILL NOT BE BINDING; HOWEVER, IT WILL BE ADMISSIBLE IN ANY SUBSEQUENT APPEAL UNDER THE CONTRACT DISPUTES ACT.

A FRAMED COPY OF THIS WARRANTY SHALL BE POSTED IN THE MECHANICAL ROOM OR OTHER APPROVED LOCATION DURING THE ENTIRE WARRANTY PERIOD.

SECTION 07 54 19
POLYVINYL-CHLORIDE ROOFING
02/13

PART 1 GENERAL

1.01 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/SPRI ES-1	(2003) Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7	(2017) Minimum Design Loads for Buildings and Other Structures

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)

ASSP A10.24	(2014) Roofing - Safety Requirements of Low-Sloped Roofs

ASTM INTERNATIONAL (ASTM)

ASTM C578	(2018) Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
ASTM D4434/D4434M	(2015) Standard Specification for Poly(Vinyl Chloride) Sheet Roofing
ASTM E108	(2011) Fire Tests of Roof Coverings

FM GLOBAL (FM)

FM 4470	(2010) Single-Ply, Polymer-Modified Bitumen Sheet, Built-up Roof (BUR), and Liquid Applied Roof Assemblies for Use in Class 1 and Noncombustible Roof Deck Construction
FM 4471	(2010) Class I Panel Roofs
FM APP GUIDE	(updated on-line) Approval Guide http://www.approvalguide.com/

INTERNATIONAL CODE COUNCIL (ICC)

ICC IBC	(2018) International Building Code

METAL BUILDING MANUFACTURERS ASSOCIATION (MBMA)

MBMA RSDM	(2012) Metal Roofing Systems Design Manual

NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)

NRCA 3619	(2004) Quality Control Guidelines for Application of Polymer-Modified Bitumen Roofing
NRCA 3740	(2005) The NRCA Waterproofing Manual

U.S. DEPARTMENT OF ENERGY (DOE)

Energy Star	(1992; R 2006) Energy Star Energy Efficiency Labeling System (FEMP)

UNDERWRITERS LABORATORIES (UL)

UL 580	(2006; Reprint Nov 2018Mar 2019) UL Standard for Safety Tests for Uplift Resistance of Roof Assemblies
UL 790	(2004; Reprint Jul 2014) Standard Test Methods for Fire Tests of Roof Coverings

1.02 SUMMARY

Mechanically fastened, induction-welded, polyvinyl-chloride (PVC) roof membrane system applied over coverboard, flute-fill insulation and metal roof panel substrate.

1.03 ASSEMBLY REQUIREMENTS

Provide roofing membrane sheet widths consistent with membrane attachment methods and wind uplift requirements, and as large as practical. In order to minimize joints and 3-way overlaps, prefabricated sheets are not accepted. Provide membrane which is free of defects and foreign material. Coordinate flashing work to permit continuous roof-surfacing operations. Install insulation and weatherproofed planned sections on the same day.

A. Fire Resistance

Complete roof system assembly:

a. Class A rated in accordance with ASTM E108, FM 4470, or UL 790; and

FM or UL approved components of the roof covering assembly must bear the appropriate FM or UL label.

B. Wind Uplift Resistance

Provide a complete roof system assembly that is rated and installed to resist wind loads indicated on drawings and calculated in accordance with ASCE 7] and validated by uplift resistance testing in accordance with Factory Mutual (FM) test procedures. Do not install non-rated systems, except as approved by the Contracting Officer. Submit Engineering calculations, signed, sealed, and dated by a Registered Engineer validating the wind resistance per ASCE 7, and ANSI/SPRI ES-1 of non-rated roof

system. Base wind uplift measurements on a design wind speed of 110 mph in accordance with ASCE 7 and other applicable building code requirements.

C. Solar Reflectance Index (SRI)

SRI measures the roof's ability to reject solar heat, defined such that a standard black (reflectance 0.05, emittance 0.90) is 0 and a standard white (reflectance 0.80, emittance 0.90) is 100. Use roofing materials having minimum appropriate SRI for more than 75 percent of roof surface (low slope (less than 2:12) SRI greater than 78; high slope (greater than 2:12) SRI greater than 29).

1.04 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval and for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 50 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Detail Drawings; G

Roof Plan; G

SD-03 Product Data

PVC Roofing Membrane; G

Energy Star Label for roof membrane; S

Bonding Adhesive

Flashing

Membrane Fasteners and Plates

Roof Insulation

Pre-Manufactured Accessories

Water Cutoffs

Information Card

SD-05 Design Data

Wind Uplift Resistance; G

SD-07 Certificates

Qualification of Manufacturer

Qualifications of Applicator

Qualification of Engineer of Record

Wind Uplift Resistance

Fire Resistance classification

Minimum Polymer Thickness

Sample Warranty; G

SD-08 Manufacturer's Instructions

Application Method; G

Membrane Flashing; G

Perimeter Attachment

Auxiliary Fasteners

Protection Mat

Pre-Manufactured Accessories

Cold Weather; G

SD-11 Closeout Submittals

Warranty; G

Information Card; G

Instructions to Government Personnel; G

1.05 QUALITY ASSURANCE

A. Qualification of Manufacturer

Polyvinyl-Chloride sheet roofing system manufacturer must have a minimum of 10 years experience in manufacturing PVC roofing products.

Manufacturer must also provide engineering services by an authorized engineer, currently licensed in the geographic area of the project, with a minimum of five (5) years experience as an engineer knowledgeable in roof wind design analysis, protocols and procedures for MBMA RSDM, ASCE 7, UL 580, and FM 4471. Engineer must provide certified engineering calculations for:

Wind uplift requirements in accordance with Local codes

ASCE 7, in accordance with ICC IBC.

Seismic requirements per local building codes

Seismic requirements per ICC IBC Chapter 16, Section 1613

B. Qualifications of Applicator

Roofing system applicator must be approved, authorized, or licensed in writing by the PVC sheet roofing system manufacturer and have a minimum of five years experience as an approved, authorized, or licensed applicator with that manufacturer and be approved at a level capable of providing the specified warranty. Supply the names, locations and client contact information of five projects, within the previous three years, of similar size and scope that the applicator has constructed using the manufacturer's roofing products submitted for this project.

C. Conformance and Compatibility

Provide an entire roofing and flashing system that is in accordance with specified and indicated requirements, including fire and wind resistance.

D. Preroofing Conference

After approval of submittals and before performing roofing system installation work, hold a preroofing conference to review the following:

a. Drawings, including roof plan, specifications and submittals related to the roof work. Field inspection and verification of all existing conditions, including all fire safety issues, existing structure, and existing materials, including concealed combustibles, which may require additional protection during installation.

b. Roof system components installation;

c. Procedure for the roof manufacturer's technical representative's onsite inspection and acceptance of the roofing substrate, and roofing substrate, the name of the manufacturer's technical representatives, the frequency of the onsite visits, distribution of copies of the inspection reports from the manufacturer's technical representative to roof manufacturer;

d. Contractor's plan for coordination of the work of the various trades involved in providing the roofing system and other components secured to the roofing; and

e. Quality control(NRCA 3619) plan for the roof system installation;

f. Safety requirements.

Coordinate preroofing conference scheduling with the Contracting Officer. The conference must be attended by the Contractor, the Contracting Officer's designated personnel, personnel directly responsible for the installation of roofing and insulation, flashing and sheet metal work, other trades interfacing with the roof work, designated safety personnel trained to enforce and copy with ASSP A10.24, and a representative of the roofing materials manufacturer. Before beginning roofing work, provide a

copy of meeting notes and action items to all attending parties. Note action items requiring resolution prior to start of roof work.

1.06 DETAIL DRAWINGS

Submit roof plan depicting wind loads and boundaries of enhanced perimeter and corner attachments of roof system components, location of perimeter half-sheets, spacing of perimeter, corner, and infield fasteners, as applicable. Provide drawings that reflect the project roof plan of each roof level and conditions indicated. Submit bids with approved detail drawings and specifications approved and furnished by the PVC membrane manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery

Deliver materials in the manufacturer's original, unopened containers and rolls with labels intact and legible. Mark and remove wet or damaged materials from the site. Where materials are covered by a referenced specification number, the container must bear the specification number, type, class, and shelf life expiration date where applicable. Deliver materials in sufficient quantity to allow work to proceed without interruption.

B. Storage

Protect materials against moisture absorption and contamination or other damage. Avoid crushing or crinkling of roll materials. Store roll materials on end on clean raised platforms or pallets one level high in dry locations with adequate ventilation, such as an enclosed building or closed trailer. Do not store roll materials in buildings under construction until concrete, mortar, and plaster work is finished and dry. Maintain roll materials at temperatures above 50 degrees F for 24 hours immediately before application. Do not store materials outdoors unless approved by the Contracting Officer. Completely cover felts stored outdoors, on and off roof, with waterproof canvas protective covering. Do not use polyethylene sheet as a covering. Tie covering securely to pallets to make completely weatherproof. Provide sufficient ventilation to prevent condensation. Do not store more materials on roof than can be installed the same day and remove unused materials at end of each days work. Distribute materials temporarily stored on roof to stay within live load limits of the roof construction.

a. Maintain a minimum distance of 35 foot for all stored flammable materials, including materials covered with shrink wraps, craft paper or tarps from all torch/welding applications.

b. Immediately remove wet, contaminated or otherwise damaged or unsuitable materials from the site. Damaged materials may be marked by the Contracting Officer.

C. Handling

Prevent damage to edges and ends of roll materials. Do not

install damaged materials in the work. Select and operate material handling equipment to prevent damage to materials or applied roofing.

1.08 ENVIRONMENTAL REQUIREMENTS

Do not install roofing system when air temperature is below 40 degrees F, during any form of precipitation, including fog, or when there is ice, frost, moisture, or any other visible dampness on the roof deck. Follow manufacturer's printed instructions for Cold Weather Installation.

1.09 SEQUENCING

Coordinate the work with other trades to ensure that components which are to be secured to or stripped into the roofing system are available and that permanent flashing and counterflashing in accordance with NRCA 3740, are installed as the work progresses. Ensure temporary protection measures are in place to preclude moisture intrusion or damage to installed materials. Apply roofing immediately following application of insulation as a continuous operation. Coordinate roofing operations with insulation work so that all roof insulation applied each day is covered with roof membrane installation the same day.

1.10 WARRANTY

Provide roof system material and workmanship warranties. Provide revision or amendment to standard membrane manufacturer warranty as required to comply with the specified requirements. Provide a manufacturer's warranty that has no dollar limit, covers full system water-tightness, and has a minimum duration of 20 years. Submit sample certificate.

A. Roof Membrane Manufacturer Warranty

Furnish the roof membrane manufacturer's 20-year, no dollar limit roof system materials and installation workmanship warranty, including flashing, insulation, and accessories necessary for a watertight roof system construction. Provide warranty directly to the Government and commence warranty effective date at time of Government's acceptance of the roof work. The warranty must state that:

a. If within the warranty period the roof system, as installed for its intended use in the normal climatic and environmental conditions of the facility, becomes non-watertight, shows evidence of moisture intrusion within the assembly, splits, tears, cracks, delaminates, separates at the seams, or shows evidence of excessive weathering due to defective materials or installation workmanship, the repair or replacement of the defective and damaged materials of the roof system assembly and correction of defective workmanship are the responsibility of the roof membrane manufacturer. All costs associated with the repair or replacement work are the responsibility of the roof membrane manufacturer.

b. When the manufacturer or his approved applicator fail to perform the repairs within 72 hours of notification,

emergency temporary repairs performed by others does not void the warranty.

B. Roofing System Installer Warranty

The roof system installer must warrant for a minimum period of two years that the roof system, as installed, is free from defects in installation workmanship, to include the roof membrane, flashing, insulation, accessories, attachments, and sheet metal installation integral to a complete watertight roof system assembly. Write the warranty directly to the Government. The roof system installer is responsible for correction of defective workmanship and replacement of damaged or affected materials. The roof system installer is responsible for all costs associated with the repair or replacement work.

C. Continuance of Warranty

Repair or replacement work that becomes necessary within the warranty period must be approved, as required, and accomplished in a manner so as to restore the integrity of the roof system assembly and validity of the manufacturer warranty for the remainder of the manufacturer warranty period.

1.11 DESCRIPTION OF ROOF MEMBRANE SYSTEM

Roof Area E: Thermoplastic single-ply PVC membrane induction welded to manufacturer supplied plates attached through poylstyrene flute-fill insulation with high density polyisocyanurate coverboard and existing trapezoidal metal roof panels to structural purlins.

PART 2 PRODUCTS

2.01 MATERIALS

Coordinate with other specification sections related to the roof work. Furnish a combination of specified materials that comprise a roof system acceptable to the roof membrane manufacturer and meeting specified requirements. Protect materials provided from defects and make suitable for the service and climatic conditions of the installation.

A. PVC Roof Membrane

Provide a minimum polymer thickness 0.060 inch reinforced PVC as specified herein. Provide PVC system capable of obtaining 20 year warranties and as listed in the applicable wind uplift and fire rating classification listings.

Submit Data as required by Section 07 22 00 ROOF AND DECK INSULATION together with requirements of this section. Provide data that includes written acceptance by the roof membrane manufacturer of the insulation and other products and accessories to be provided by and warranted under the full system guarantee of the roof membrane manufacturer.

a. Coordinate with other specification sections related to the roof work. Furnish a combination of specified materials that comprise a roof system acceptable to the roof membrane

manufacturer and meeting specified requirements. Provide materials free of defects and suitable for the service and climatic conditions of the installation. Provide warranted roof system in which all components are sourced from the PVC roof membrane manufacturer, including but not limited to all insulation, coverboards, accessories, adhesives and edge metal.

b. For each roof, furnish a typewritten information card for facility records and a card laminated in plastic and framed for interior display at roof access point, or a photoengraved 0.032 inch thick aluminum card for exterior display. Provide card that is 8 1/2 by 11 inches minimum. On the information card identify facility name and number; location; contract number; approximate roof area; detailed roof system description, including deck type, membrane, number of plies, method of application, manufacturer, insulation and cover board system and thickness; presence of tapered insulation for primary drainage, presence of vapor retarder; date of completion; installing Contractor identification and contact information; membrane manufacturer warranty expiration, warranty reference number, and contact information. Install card at roof top or access location as directed by the Contracting Officer and provide a paper copy to the Contracting Officer.

B. Energy Star

Provide a roof membrane that is Energy Star labeled. Provide data identifying Energy Star label for roof membrane product.

C. Energy Performance

Install a roof system that meets an overall performance as specified on the drawings or by insulation specified in other sections.

D. Bonding Adhesive

Provide PVC membrane manufacturer's recommended adhesive, as supplied by roof membrane manufacturer, and recommended by the manufacturer's printed data for bonding of PVC membrane materials to acceptable insulation, wood, metal, concrete or other acceptable substrate materials. Do not use bonding adhesive to bond membrane materials to each other.

E. Water Cutoff Mastic/Water Block

As supplied by the roof membrane manufacturer and recommended by the manufacturer's printed data.

F. Membrane Flashing

Provide membrane flashing, including self-adhering membrane flashing, perimeter flashing, flashing around roof penetrations and prefabricated pipe seals, of a minimum polymer thickness 0.060 inch reinforced PVC for 20 year warranties, and utilized as recommended and supplied by the roof membrane manufacturer or minimum 0.060 inch thick reinforced PVC roof membrane and

flashings for 20 year warranties. Submit certification from PVC membrane manufacturer that the proposed PVC membrane roofing product meets the minimum polymer thickness specified.

G. Membrane Fasteners and Plates

Coated, corrosion-resistant fasteners as recommended and supplied by the PVC roof membrane manufacturer and meeting the requirements of FM 4470 and FM RoofNav (www. roofnav.com) or FM APP GUIDE for Class I roof deck construction and the wind uplift resistance specified. Fasteners and plates to be supplied and warranted for the substrate type(s) by PVC membrane manufacturer and recommended by PVC membrane manufacturer's printed data.

1. Stress Plates, Bar or Rail for Fasteners

Basis of design: Rhinobond. Utilize corrosion-resistant, polymer coatedstress plates as recommended by the roof membrane manufacturer's printed instructions and meeting the requirements of FM 4470 for use in induction welding of membrane to plate. Stress plates to be supplied by PVC roof membrane manufacturer. Form stress plates to prevent dishing or cupping. Manufacturer-supplied anchoring bar or rails may be utilized for high wind conditions.

2. Auxiliary Fasteners

Provide corrosion resistant screws, nails, or anchors suitable for intended attachment purpose and be recommended and supplied for use by the PVC roof membrane manufacturer.

H. Pre-manufactured Accessories

Provide pre-manufactured accessories shall be manufacturer's standard for intended purpose, must comply with applicable specification section, be compatible with the membrane roof system and approved for use and supplied by the PVC roof membrane manufacturer.

I. PVC Walk Tread

Scrim reinforced 0.096 inch thickness PVC membrane with a textured surface, compatible with and supplied by manufacturer of the PVC roof membrane.

J. Roof Insulation

Provide insulation system and facer material compatible with membrane application specified and be approved and supplied by the PVC membrane roof manufacturer.

1. Polystyrene Board

In accordance with ASTM C578 REV A, Type II, IV, or X. Membrane manufacturer approved for use as flute-fill insulation in warrantied system.

Custom-made, factory cut to match profile of existing metal

roof panels.

Thickness shall be 3 inches.

2. High Density Polyisocyanurate Roof Board

Cover board over flute-fill insulation system, coated fiberglass facers; compressive strength shall be a minimum of 90 psi; R-value of 2.5 and thickness shall be 1/2".

K. Wood Products

As specified in Section 06 10 00 ROUGH CARPENTRY, except that fire retardant treated materials must not be in contact with PVC membrane or PVC accessory products, unless approved by the membrane manufacturer and the Contracting Officer.

2.02 Reinforced, PVC Membrane

Provide reinforced polyvinyl chloride (PVC) membrane containing fibers or scrim, and complying with ASTM D4434/D4434M, Type II, and in all cases provide 0.060 inch minimum thickness for mechanically fastened application. Not withstanding the ASTM standards referenced, provide reinforced PVC roof membranes having the minimum, labeled thickness specified. Provide principal polymer used in manufacture of the membrane sheet as PVC, with width and length of PVC membrane roofing sheet consistent with membrane attachment methods and wind uplift requirements, and sheet size as large as practical. In order to minimize joints and 3-way overlaps, prefabricated sheets are not accepted. Maximum reinforced PVC membrane roofing sheet dimensions to be the maximum width obtainable from PVC membrane roof manufacturer in order to minimize seams in the field of the roof.

PART 3 EXECUTION

3.01 SYSTEM SCHEDULE

Refer to Tables 1 for a general schedule of the primary roof components (described from the bottom up) for each roof area. Methods of installation and related materials are in other sections of these specifications.

Table 1 Roof Area E

Area E
Structural Purlins
24 inch Trapezoidal Metal Roof Panel with 3 inch standing seams
Custom cut flute-fill polysytrene to match roof panel profile

Area E
1/2 inch high density polyisocyanurate insulation cover board
60 mil PVC membrane inducted welded to fastener plates attached to structural purlins

3.02 EXAMINATION

Ensure that the following conditions exist prior to application of the roofing materials:

a. Do not install items that show visual evidence of biological growth.

c. Surfaces are rigid, clean, dry, smooth, and free from cracks, holes, and sharp changes in elevation.

d. Substrate is sloped to provide positive drainage.

e. Walls and vertical surfaces are constructed to receive counterflashing, and will permit mechanical fastening of the base flashing materials.

f. Treated wood nailers are in place on non-nailable surfaces, to permit nailing of base flashing at minimum height of 8 inches above finished roofing surface.

g. Pressure-preservative treated wood nailers are fastened in place at eaves, gable ends, openings, and intersections with vertical surfaces for securing of membrane, edging strips, attachment flanges of sheet metal, and roof fixtures. Surface-applied nailers are the same thickness as the roof insulation.

h. PVC materials are not in contact with fire retardant treated wood, except as approved by the PVC membrane roof manufacturer and Contracting Officer.

j. Exposed nail heads in wood substrates are properly set. Warped and split boards have been replaced. There are no cracks or end joints 1/4 inch in width or greater.

k. Insulation boards are installed smoothly and evenly, and are not broken, cracked, or curled. There are no gaps in insulation board joints exceeding 1/4 inch in width. Insulation is attached as specified in Section 07 22 00 ROOF AND DECK INSULATION. Insulation is being roofed over on the same day the insulation is installed.

3.03 APPLICATION METHOD

Apply entire PVC membrane roofing utilizing mechanically fastened application method. Apply roofing materials as specified herein unless approved otherwise by the Contracting Officer. Submit instructions including pattern and frequency of mechanical attachments

required in the field for roof, corners, and perimeters to provide for the specified wind resistance

A. Special Precautions

a. Do not dilute coatings or sealants unless specifically recommended by the material manufacturer's printed application instructions. Do not thin liquid materials or cleaners used for cleaning PVC sheet.

b. Keep liquids in airtight containers, and keep containers closed except when removing materials.

c. Use liquid components, including adhesives, within their shelf life period. Store adhesives at 60 to 80 degrees F prior to use. Avoid excessive adhesive application and adhesive spills, as they can be destructive to some thermoplastic sheets and insulations; follow adhesive manufacturer's printed application instructions. Mix and use liquid components in accordance with label directions and manufacturer's printed instructions.

d. Provide clean, dry cloths or pads for applying membrane cleaners and cleaning of membrane.

e. Do not use heat guns or open flame to expedite drying of adhesives or primers.

f. Require workmen and others who walk on the membrane to wear clean, soft-soled shoes to avoid damage to roofing materials.

g. Do not use equipment with sharp edges which could puncture the PVC membrane roofing sheet.

h. Shut down air intakes and any related mechanical systems and seal open vents and air intakes when applying solvent-based materials in the area of the opening or intake. Coordinate shutdowns with the Contracting Officer.

B. PVC Roofing Membrane

Provide a watertight roof membrane sheet free of contaminants and defects that might affect serviceability. Provide a uniform, straight, and flat edge. Provide and install only felt-backed membrane directly on concrete deck or other hard surface which may otherwise damage the membrane, absent the felt backing. Do not place non-felt-backed PVC membrane roofing sheet directly on concrete deck or other hard surface which may damage the membrane. Provide membrane overlap of a minimum of 3 inches at sides for adhered applications and 5.5-7 inches for mechanically fastened applications and minimum 4 inches at ends. Direction of laps must allow water to flow over and not against the lap. Install membrane joints that are free of wrinkles and fishmouths. During the day of installation, probe the entire length of hot-air-welded seams and correct any deficiencies. Reweld defective areas. Cut out any fishmouths, or damaged areas and cover the area with membrane using a continuous hot-air-welded seam on all sides. Probe test repairs for continuity. Hot-air-welded seams are to be accomplished in

accordance with the PVC membrane roofing manufacturer's published requirements.

1. Nailing

Fasten membrane to nailers in accordance with the membrane manufacturer's approved instructions. Unless otherwise specified, stagger nails on 4 inch centers maximum; stagger screws for sheet metal on 8 inch centers maximum; and install rows of fasteners at least 1/2 inch from edges of sheet metal.

2. Flashing

Flash all roof edges, projections through the roof and changes in roof planes. Seal the seam a minimum of 3 inches beyond the fasteners which attach the membrane to nailers. Secure the installed flashing at the top of the flashing a maximum of12 inches on centers under the counterflashing or cap. Where possible, install prefabricated components for pipe seals and flashing accessories.

3. Cutoffs

If work is terminated prior to weatherproofing the entire roof, seal the membrane to the roof deck. Also, seal flutes in metal decking along the cutoff edge. Pull the membrane free or cut to expose the insulation when resuming work and remove the cut insulation sheets used for fill-in. Do not use asphalt or coal-tar products for sealing.

[[C. Mechanically Fastened Membrane Application

Layout membrane and lap adjoining sheets in accordance with membrane manufacturer's printed instructions such that the minimum recommended seam width is maintained and to ensure that seam width is as required by tested assembly meeting specified wind resistance requirements. Account for additional overlap required for placement of fasteners and plates or battens beyond the closed seam. Allow for sufficient membrane to form proper membrane terminations. Ensure membrane is free of wrinkles and ridges in the installation. Mechanically secure the membrane sheet with specified fasteners in the lap area. Space fasteners as required to provide the wind uplift resistance specified and in accordance with submitted fastener patterns for the field, corner, and perimeter roof areas. Set fasteners firm to plate or batten. Form field hot-air-welded seams, laps and coverstrips, as specified. Check all seams and ensure full/continuous lap seal.

D. Perimeter Attachment

Adhesive bond or mechanically secure roof membrane sheet at roof perimeter in a manner to comply with wind resistance requirements and in accordance with membrane manufacturer's printed application instructions. When adhesively bonding a mechanically fastened system in perimeter areas, the perimeter boundary of the adhesive bond must be the same as the boundary required for additional perimeter mechanical fastening to meet wind resistance

requirements.

E. Securement at Base Tie-In Conditions

Mechanically fasten the roof membrane at penetrations, at base of curbs and walls, and at all locations where the membrane turns and angles greater than 4 degrees (1:12). Space fasteners a maximum of 12 inches on center, except where more frequent attachment is required to meet specified wind resistance or where recommended by the roof membrane manufacturer. Cover over fasteners with a layer of flashing material. Hot-air-weld all seams of flashing material as recommended by the roof membrane manufacturer's printed data.

]3.04 FLASHINGS

Provide flashings in the angles formed at walls and other vertical surfaces and where required to make the work watertight, except where metal flashings are indicated.

A. General

Provide a one-ply flashing membrane, as specified for the system used, and install immediately after the roofing membrane is placed and prior to finish coating where a finish coating is required. Flashings must be stepped where vertical surfaces abut sloped roof surfaces. Provide sheet metal reglet in which sheet metal cap flashings are installed of not more than 16 inch nor less than 8 inch above the roofing surfaces. Exposed joints and end laps of flashing membrane must be made and sealed in the manner required for roofing membrane.

B. Membrane Flashing

1. Installation

Install flashing and flashing accessories as the roof membrane is installed. Apply flashing to cleaned surfaces and as recommended by the roof membrane manufacturer and as specified. Utilize cured PVC membrane flashing and prefabricated accessory flashings to the maximum extent recommended by the roof membrane manufacturer. Limit uncured flashing material to reinforcing inside and outside corners and angle changes in plane of membrane, and to flashing scuppers, pourable sealer pockets, and other formed penetrations or unusually shaped conditions as recommended by the roof membrane manufacturer where the use of cured material is impractical. Extend base flashing not less than 8 inch above roofing surface and as necessary to provide for seaming overlap on roof membrane as recommended by the roof membrane manufacturer.

2. Sealing

Seal flashing membrane for a minimum of 3 inch on each side of fastening device used to anchor roof membrane to nailers. Completely adhere flashing sheets in place. Seam flashing membrane in the same manner as roof membrane, except as otherwise recommended by the membrane

manufacturer's printed instructions and approved by the Contracting Officer. Reinforce all corners and angle transitions by applying uncured membrane to the area in accordance with roof membrane manufacturer recommendations. Mechanically fasten top edge of base flashing with manufacturer recommended termination bar fastened at maximum 12 inch on center. Install sheet metal flashing over the termination bar in the completed work. Mechanically fasten top edge of base flashing for all other terminations in a manner recommended by the roof membrane manufacturer. Apply membrane liner over top of exposed nailers and blocking and to overlap top edge of base flashing installation at curbs, parapet walls, expansion joints and as otherwise indicated to serve as waterproof lining under sheet metal flashing components.

3.05 CORRECTION OF DEFICIENCES

Where any form of deficiency is found, take additional measures as deemed necessary by the Contracting Officer to determine the extent of the deficiency and provide corrective action recommendations. Perform corrective action as directed by the Contracting Officer.

3.06 PROTECTION OF APPLIED ROOFING

At the end of the day's work and when precipitation is imminent, protect applied membrane roofing system from water intrusion.

A. Water Cutoffs

Straighten insulation line using loose-laid cut insulation sheets and seal the terminated edge of the roof membrane system in an effective manner. Seal off flutes in metal decking along the cutoff edge. Remove the water cut-offs to expose the insulation when resuming work, and remove the insulation sheets used for fill-in.

B. Temporary Flashing for Permanent Roofing

Provide temporary flashing at drains, curbs, walls and other penetrations and terminations of roofing sheets until permanent flashings can be applied. Remove temporary flashing before applying permanent flashing.

3.07 FIELD QUALITY CONTROL

A. Construction Monitoring

During progress of the roof work, make visual inspections as necessary to ensure compliance with specified parameters. Additionally, verify the following:

a. Equipment is in working order. Metering devices are accurate.

b. Materials are not installed in adverse weather conditions.

c. Substrates are in acceptable condition, in compliance with specification, prior to application of subsequent materials.

(1) Nailers and blocking are provided where and as needed.

(2) Insulation substrate is smooth, properly secured to its substrate, and without excessive gaps prior to membrane application.

(3) The proper number, type, and spacing of fasteners are installed.

(4) Materials comply with the specified requirements.

(5) All materials are properly stored, handled and protected from moisture or other damages. Liquid components are properly mixed prior to application.

(6) Adhesives are applied uniformly to both mating surfaces and checked for proper set prior to bonding mating materials. Mechanical attachments are spaced as required, including additional fastening of membrane in corner and perimeter areas as required.

(7) Membrane is properly overlapped.

(8) Membrane seaming is as specified by PVC membrane manufacturer. All seams are checked at the end of each work day.

(9) Applied membrane is inspected and repaired as necessary prior to paver installation.

(10) Membrane is adhered without ridges, wrinkles, kinks, fishmouths.

(11) Installer adheres to specified and detailed application parameters.

(12) Associated flashing's and sheet metal are installed in a timely manner in accord with the specified requirements.

(13) Paver ballast is within the specified weight range.

(14) Temporary protection measures are in place at the end of each work shift.

B. Manufacturer's Inspection

Manufacturer's technical representative must visit the site a minimum of 3 times during the installation for purposes of reviewing materials installation practices and adequacy of work in place. Inspections must occur during the first 20 squares of membrane installation, at mid-point of the installation, and at substantial completion, at a minimum. Additional inspections need not exceed one for each 100 squares of total roof area with the exception that follow-up inspections of previously noted deficiencies or application errors must be performed as requested by the Contracting Officer. After each inspection, a report, signed by the manufacturer's technical representative to the roofing Contractor and then to the Contracting Officer within 3 working days. Within the report state the overall quality of

work, deficiencies and any other concerns, and recommended corrective action.

3.08 CLEAN UP

Remove debris, scraps, containers and other rubbish and trash resulting from installation of the roofing system from job site each day.

3.09 INSTRUCTIONS TO GOVERNMENT PERSONNEL

Furnish written and verbal instructions on proper maintenance procedures to designated Government personnel. Furnish instructions by a competent representative of the roof membrane manufacturer and include a minimum of 4 hours on maintenance and emergency repair of the membrane. Include a demonstration of membrane repair, and give sources of required special tools. Furnish information on safety requirements during maintenance and emergency repair operations. Include copies of Safety Data Sheets for maintenance/repair materials.

-- End of Section --

SECTION 07 62 00.00 48.00 48

FLASHING AND SHEET METAL
10/10

PART 1 GENERAL

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/SPRI ES-1	(2003) Wind Design Standard for for Edge Systems Used with Low Slope Roofing Systems

ASTM INTERNATIONAL (ASTM)

ASTM A 167	(1999; R 2009) Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A 792/A 792M	(2009a) Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
ASTM B 221	(2008) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM B 32	(2008) Standard Specification for Solder Metal
ASTM C 920	(2010) Elastomeric Joint Sealants
ASTM D 1970	(2009) Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
ASTM D 226/D 226M	(2009) Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing

ASTM D 41	(2005) Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
ASTM D 4586	(2007) Asphalt Roof Cement, Asbestos-Free
ASTM D1005	(2013) Standard Test Method for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

SMACNA 1793	(2006) Architectural Sheet Metal Manual, Sixth Edition, Second Printing

1.2 SUMMARY

1.2.1 This Section includes the following: Sheet metal flashing and trim.

1.2.2 Related Sections include the following:

1.2.2.1 Division 07 01 50 Preparation for Reroofing.

1.2.2.2 Division 07 52 00.00 48 SBS-Modified Bituminous Membrane Roofing System.

1.2.2.3 Division 07 54 19 Polyvinyl-Chloride Roofing.

1.3 GENERAL REQUIREMENTS

Finished sheet metalwork will form a weathertight construction without waves, warps, buckles, fastening stresses or distortion, which allows for expansion and contraction. Sheet metal mechanic is responsible for cutting, fitting, drilling, and other operations in connection with sheet metal required to accommodate the work of other trades. Coordinate installation of sheet metal items used in conjunction with roofing with roofing work to permit continuous roofing operations.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 50 SUBMITTAL PROCEDURES:

Do not purchase, fabricate or install any sheet metal item until all required shop drawings and related submittals for each item are approved. Items purchased, fabricated and/or installed which are not in compliance with approved shop drawings are subject to immediate removal from the project at contractor's expense.

Obtain approval of shop drawings, samples and certifications prior to fabrication and installation.

Acceptable Manufacturer Products

Manufacturer products listed in this specification are referenced to

establish a standard of quality. When the specific product listed is submitted by the Contractor that submittal will be considered For Information Only. When an equal to that named in this specification is submitted it shall be For Government Approval (G). The following manufacturer products are specifically mentioned in this specification:

ARKEMA Inc. 2000 Market Street Philadelphia, PA 19103 (800) 596-2750 www.arkema.com	Galvanized Steel Sheet Finish KYNAR 500
Grace Construction Products 62 Whittemore Avenue Cambridge, MA 02140 (866)333-37266832 www.graceconstruction.com	Self-Adhering Membrane Grace Ultra

Manufacturer Products submitted as an "or equal"; **G, ED**

SD-02 Shop Drawings

Gutters; G,

Downspouts; G,

Gravel stops and fascias; G,

Splash pans; G,

Flashing for roof drains; G,

Base flashing; G,

Counterflashing; G,

Flashing at roof penetrations; G,

Reglets; G,

Scuppers; G,

Copings; G,

Edge Metal; G,

Conductor heads

Submit shop drawings of all specified types of metal shapes, showing details of proposed installation, including complete dimensions, metal types and fastening, where appropriate.

Indicate thicknesses, dimensions, fastenings and anchoring methods, expansion joints, and other provisions necessary for thermal expansion and contraction. Scaled manufacturer's catalog data may be submitted for factory fabricated items.

SD-03 Product Data

Materials List: Give written notification of the brand name and manufacturer of each material proposed for use and include a statement that all proposed materials meet the specification requirements. Obtain approval prior to placing orders.

Submittal of catalog cut sheets, etc. in lieu of the materials list required above is not acceptable. Do not submit cut sheets unless specifically requested.

Lead Sheet; G

Aluminum-Zinc (Galvalume) Alloy-Coated Steel Sheet; G

Stainless Steel; G

Elastomeric Joint Sealants; G

Solder; G

Aluminum Alloy; G

Self-Adhering Membrane; G

Asphalt Roofing Cement; G

Fasteners; G

Roofing Felt; G

Asphalt Primer; G

SD-04 Samples

Submit two 6 inch long samples of each metal shape.

Color Chart: Manufacturer's standard range of colors for prefinished metals, including available gauges.

SD-07 Certificates

Manufacturer Certificates

Provide an original document signed by a responsible officer of the manufacturing firm, notarized, on manufacturer's standard letterhead, certifying materials furnished for project comply with the referenced standard. Certificate shall specifically reference the project and applicable compliance standard.

SD-11 Closeout Submittals

Quality Control Plan

Submit for sheet metal work in accordance with paragraph entitled "Field Quality Control."

1.5 DELIVERY, HANDLING, AND STORAGE

Package and protect materials during shipment. Uncrate and inspect materials for damage, dampness, and wet-storage stains upon delivery to

the job site. Remove from the site and replace damaged materials that cannot be restored to like-new condition. Handle sheet metal items to avoid damage to surfaces, edges, and ends. Store materials in dry, weather-tight, ventilated areas until immediately before installation.

Restrict on-site storage to minimum for work in progress. Protect all stored metal from exposure to weather and physical damage.

PART 2 PRODUCTS

2.1 MATERIALS

Use any metal listed by SMACNA Arch. Manual for a particular item, unless otherwise specified or indicated. Conform to the requirements specified and to the thicknesses and configurations established in SMACNA Arch. Manual for the materials. Different items need not be of the same metal, except that if copper is selected for any exposed item, all exposed items must be copper.

Furnish sheet metal items in 8 to 10 foot lengths. Single pieces less than 8 feet long may be used to connect to factory-fabricated inside and outside corners, and at ends of runs. Factory fabricate corner pieces with minimum 12 inch legs. Provide accessories and other items essential to complete the sheet metal installation. Provide accessories made of the same or compatible materials as the items to which they are applied. Fabricate sheet metal items of the materials specified below and to the gage, or thickness shown in Table I at the end of this section. Provide sheet metal items with mill finish unless specified otherwise. Where more than one material is listed for a particular item in Table I, each is acceptable and may be used except as follows:

2.1.1 Exposed Sheet Metal Items

Must be of the same material. Consider the following as exposed sheet metal: gutters, including hangers; downspouts; gravel stops and fascias; cap, valley, steeped, base, and eave flashings and related accessories.

2.1.2 Drainage

Do not use copper for an exposed item if drainage from that item will pass over exposed masonry, stonework or other metal surfaces. In addition to the metals listed in Table I, lead-coated copper may be used for such items.

2.1.3 Lead Sheet

Minimum weight 4 pounds per square foot, soft lead.

2.1.4 Aluminum-Zinc (Galvalume) Alloy-Coated Steel Sheet:

ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40 (Class AZM150 coating designation, Grade 275); structural quality.

Exposed Finish: Manufacturer's smooth finish, pre-finished color coatings consisting of full strength 70% Kynar 500 fluorocarbon (Polyvinylidene Fluoride PVF2) coating over a urethane primer on the finish side, with primer and a wash coat on the reverse. All measurements per NCCA Technical Bulletin II-4 or ASTM D1005. A strippable plastic film should protect the finish during fabrication and installation. Manufacturer's

standard color to be selected by Owner.

2.1.5 Polymer Clad Metal (PVC)

Polymer Clad Metal - Heat-weldable, 24 gauge, AISI G90 galvanized steel sheet with a 20-mil unsupported thermoplastic membrane coating to match the flashing membrane composition laminated on one side. Polymer-Clad metal shall be manufactured by, and included in the warranty of, the single-ply membrane Manufacturer. Color shall be selected by Owner.

2.1.6 Stainless Steel

ASTM A 167, Type 302 or 304, 2D Finish, fully annealed, dead-soft temper.

2.1.7 Aluminum Alloy, Extruded Bars, Rods, Shapes, and Tubes

ASTM B 221.

2.1.8 Solder

ASTM B 32, with 50% lead and 50% tin unless otherwise specified herein.

2.1.9 Elastomeric Joint Sealants

Sealant: One-component elastomeric gun grade polyurethane sealant conforming to ASTM C 920, Type S, Grade NS, Class 25, and use NT, M, A, G, or O as required by substrate conditions. Color to match adjacent materials.

2.1.10 Self-Adhering Membrane

Self-Adhering Membrane: ASTM D 1970, polyethylene film laminated to a layer of high temp rubberized asphalt adhesive, with slip-resistant surface and release paper backing.

2.1.11 Asphalt Roofing Cement

ASTM D 4586, Type II, asbestos-free.

2.1.12 Roofing Felt

ASTM D 226/D 226M Type II.

2.1.13 Asphalt Primer

ASTM D 41.

2.1.14 Fasteners

Use the same metal or a metal compatible with the item fastened. Use stainless steel fasteners to fasten dissimilar materials.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

Inspect all surfaces to which metal will be applied. Do not install metal unless surfaces are even, sound, clean, dry and free from defects that might affect the application.

Follow recommendations of SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, for fabricating in-shop and on-site, and for installation, unless otherwise specified herein or on Drawings.

Low slope membrane roof metal edge securement, except gutters, shall be formed for wind resistance in accordance with ANSI/SPRI ES-1.

Follow published instructions of the product manufacturer for installation of extruded or proprietary metal products, unless otherwise specified herein or on Drawings.

Use nails, screws, bolts, cleats or other fasteners of the same material or, if approved by ARMY RESERVE, of material chemically compatible with the contacted metal.

Fabricate cleats to be a minimum of one gauge heavier than fascia metal.

Secure cleats to substrate with fasteners specifically manufactured for the purpose at spacings of 6-inch on center. Provide ring shank fasteners or screws at wood substrates. Locate fasteners as close to hem of cleat as practical but no more than 2 inches from hem unless specifically indicated otherwise herein or on Drawings.

Solder metal, where required, using standard industry techniques in accordance with the requirements of SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, for the types of metal to be soldered. Thoroughly sweat joints to ensure full penetration of solder in the joint and to ensure a secure connection. Fully solder rivet joints to eliminate rivet holes or potential for corrosion.

Do not place dissimilar metals in direct contact or in positions where water sheds across both metals.

Where aluminum is in contact with masonry or concrete, coat the contacting surface with bituminous paint.

Install metal to be water and weather tight with lines, arrises and angles sharp and true and with plane surfaces free of waves or buckles. Hem all raw edges of exposed or finish sheet metal.

Install shop-formed metal in 10-foot lengths maximum and with minimum number of pieces in each straight run.

Miter and seal all inside and outside corners of edge metal and coping cap. Shop fabricated corner pieces are preferable.

Shop form all metal shapes, which are to be formed of prefinished metal, with protective plastic film in place. Do not remove plastic film until just prior to (or, if possible, after) installation.

At all corners, shop form corner pieces of edge metal and coping cap with 18-inch legs (joints no more than 18-inches from corner). Seal joint of corner piece.

Form faces of drip edge and coping cap with vertical faces of sufficient width to extend a minimum of 2-inch below wood blocking.

Prime all metal components that will be in contact with bituminous

materials.

3.2 EDGE METAL INSTALLATION

Install new edge metal or replace existing edge metal as specified herein. Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, Figure 2-1.

Refer to Table I, Sheet Metal Schedule, for gauge and metal type.

Fabricate edge metal with flange width no wider than the width of the blocking less 1/2-inch and not less than 4-inches.

At edges where gutters are required, install gutters before edge metal.

Apply a strip of self-adhering membrane across the top of the blocking over roof membrane and extending down the outside face approximately the width of the vertical section of the edge metal. Use strips as long as practical, lapping the ends 6-inches.

Engage formed drip at lower edge of face with continuous cleat.

Set flange in continuous bed of asphalt roof cement on top of the self-adhering membrane.

Leave a 1/4-inch opening between sections. Center the cover plat over the opening, set in asphalt roof cement and nail with two nails through opening between sections. Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, Figure 2-5.

Nail through flange near center. Space nails 3-inches on center in a staggered pattern. Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, Figure 2-1.

3.3 COUNTERFLASHING INSTALLATION

Install new counterflashings at locations shown on drawings as specified herein. Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, Figure 4-4.

Refer to Table I, Sheet Metal Schedule, for gauge and metal type.

Install new counterflashing at all roof mounted equipment. Extend new counterflashing across top of curb beneath seating flange of unit. Extend flange down a minimum of 4-inches over base flashing. Secure counterflashing to top of curb, or to integral flange of unit with appropriate fasteners at 4-inches on center.

Insert upper edge of receiver, or counterflashing, into reglet. Secure with driven lead wedges not over 18-inches on center. Fabricate wedges from lead wool.

Insert upper edge of counterflashing in metal receiver. Bend receiver neatly and snugly to face of counterflashing.

Secure counterflashing to metal receiver with stainless steel fasteners spaced no more than 8-inches on center.

Secure counterflashing to vertical surface with appropriate fasteners.

Notch and seal receiver at corners.

Notch and lap joints and inside corners. Notch and seam outside corners. Do not rivet or otherwise secure joints and corners.

Fill reglet to full depth with permanent, non-shrinking sealant.

Lap ends of counterflashing 4-inches. Crimp hem of overlapping section around hem of underlapping section.

3.4 DRAIN FLASHING INSTALLATION

Use 4-pound lead sheet 36-inches by 36-inches or at least large enough to extend a minimum of 12-inches outside drain flashing flange.

Cut hole in center of sheet with diameter 2-inches less than inside diameter of flashing flange.

Center hole over center of drain, set lead sheet in solid bed of roofing cement, install flashing flange over lead sheet and pull it down tightly and evenly.

Trim excess lead from inside flashing flange, leaving approximately 1 to 2 inches of lead extending into drain bowl. Turn lead uniformly down into bowl using rubber mallets to shape lead. Do not tear or cut lead. Where bolts must penetrate lead, punch holes through lead to a slightly smaller size than bolts and pull lead snugly over bolts. Press lead sheet around drain into roof cement evenly and uniformly.

3.5 BASE FLASHING CLOSURE INSTALLATION

Install new base flashing closures where base flashings abruptly end as specified herein. Refer to Drawings.

Refer to Table I, Sheet Metal Schedule, for gauge and metal type.

Completely seal all joints to be watertight.

Install closures over roof membrane and under base flashings.

Extend closures up under counterflashings, where present or specified.

Install closures to completely seal ends of base flashings, membrane and cants as well as end joints of edge metal or drip edge, if present.

3.6 COPING CAP INSTALLATION

Install new coping cap at locations shown on drawings as specified herein.

Refer to Table I, Sheet Metal Schedule, for gauge and metal type.

Prior to installation of coping cap, apply a strip of self-adhering membrane across the top of the blocking and extending down the outside and inside face approximately the width of the vertical sections of the coping cap. Use strips as long as practical, lapping the ends 6-inches.

Secure both vertical sections with a continuous cleat nailed to wood blocking.

Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, Chapter 3, COPINGS, for cleat and coping hem dimensions.

Join sections with 1-inch vertical single-lock standing seams and caulk with approved sealant. Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, Figure 3-3, Seam 22.

3.7 MISCELLANEOUS FLANGED FLASHING INSTALLATION

Set flange on top of roofing membrane in solid bed of asphalt roof cement.

Set flange in solid bed of asphalt roof cement. If flange width exceeds 12-inches, secure to deck with sheet metal screws or other suitable fasteners placed near each corner and at center of each side.

Except at plumbing vents, or other locations where flashing is turned into top of pipe, or otherwise integrally secured against water entry, install bonnet flashing extending below and beyond edges of flashing riser and secure mechanically to roof penetration so that connection is watertight. Securing by sealant alone is not acceptable.

3.8 SCUPPER LINER INSTALLATION

Install new primary scupper liners and overflow scupper liners where shown on drawings as specified herein. Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, Figure 1-30.

Refer to Table I, Sheet Metal Schedule, for gauge and metal type.

Cover all masonry surfaces to be in contact with scupper with a bed of asphalt roof cement.

Install scupper. Install closure flanges at both sides of wall, lock and seal closure flange seams.

Bottom edge of overflow scuppers shall be located in wall between 2 and 4 inches above drain elevation.

3.9 GUTTER INSTALLATION

Install new gutters at locations shown on drawings as specified herein. Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, Figure 1-13.

Refer to Table I, Sheet Metal Schedule, for gauge and metal type.

Size gutters as indicated on drawings.

Provide butt-type expansion joints in gutters at at locations shown on Drawings. Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, Figure 1-6.

Provide Aluminum gutter hanger sized at 3/16 -inches by 1-inch spaced 3-feet on center. Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, Figure 1-13.

Provide aluminum gutter spacers sized at 1 -inch by 1/8-inch spaced 3-feet on center. Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth

Edition, Second Printing, Figure 1-13.

3.10 DOWNSPOUT INSTALLATION

Install new downspouts at gutters as specified herein. Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, Figure 1-32.

Refer to Table I, Sheet Metal Schedule, for gauge and metal type.

Size downspouts as indicated on drawings.

Install downspouts at locations shown on Drawings.

Form downspout hangers from the same material as downspouts using material not less than 2 gauges heavier than downspouts.

Secure downspouts to wall with hangers spaced not more than 5-feet on center. Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, Figure 1-35.

Connect downspouts to outlet tubes of the same material as the gutter. Refer to SMACNA 1793, Architectural Sheet Metal Manual, Sixth Edition, Second Printing, Figures 1-24C and 1-33.

Where downspouts terminate at lower roof areas, extend downspout across lower roof surface, over roof edge, and down to grade. Where gutters are present along perimeter of lower roof, terminate downspout at gutter. Where necessary, provide slope in downspouts to allow positive drainage. Provide pre-manufactured supports and walkpads under downspouts on roof(s). Space supports and walkpads no more than 4-feet apart.

Where downspouts terminate at grade, provide new precast concrete splash blocks. Set blocks on grade with uniform solid support. Provide elbows at base of downspouts which turn out at 45°.

3.11 PAINTING

Field-paint sheet metal for separation of dissimilar materials.

3.12 CLEANING

Clean exposed sheet metal work at completion of installation. Remove grease and oil films, handling marks, contamination from steel wool, fittings and drilling debris, and scrub-clean. Free the exposed metal surfaces of dents, creases, waves, scratch marks, and solder or weld marks.

3.13 REPAIRS TO FINISH

Scratches, abrasions, and minor surface defects of finish may be repaired in accordance with the manufacturer's printed instructions and as approved. Repair damaged surfaces caused by scratches, blemishes, and variations of color and surface texture. Replace items which cannot be repaired.

3.14 FIELD QUALITY CONTROL

Establish and maintain a Quality Control Plan for sheet metal used in conjunction with roofing to assure compliance of the installed sheet

metalwork with the contract requirements. Remove work that is not in compliance with the contract and replace or correct. Include quality control, but not be limited to, the following:

a. Observation of environmental conditions; number and skill level of sheet metal workers; condition of substrate.

b. Verification that specified material is provided and installed.

c. Inspection of sheet metalwork, for proper size(s) and thickness(es), fastening and joining, and proper installation.

3.14.1 Procedure

Submit for approval prior to start of roofing work. Include a checklist of points to be observed. Document the actual quality control observations and inspections. Furnish a copy of the documentation to the Contracting Officer at the end of each day.

TABLE I. SHEET METAL SCHEDULE

Edge Metal:	24 gage prefinished galvalume.
Polymer Clad Edge Metal:	24 gage polymer clad.
Polymer Clad Cover Plate:	24 gage polymer clad.
Edge Metal Extension:	24 gage prefinished galvalume.
Fascia Closure:	24 gage prefinished galvalume.
Continuous Cleat:	22 gage galvalume.
Counterflashing:	24 gage prefinished galvalume.
Slip flashing:	24 gage prefinished galvalume.
Base Flashing Closure:	24 gage prefinished galvalume.
Gutters:	24 gage prefinished galvalume
Overflow Scupper Liners:	24 gage stainless steel
Overflow Scupper face plate:	24 gage prefinished galvalume.
Downspouts:	24 gage prefinished galvalume
Coping Caps:	24 gage prefinished galvalume
Bonnet Flashings:	24 gage stainless steel.
Splash Pans:	24 gage stainless steel.

-- End of Section --

OVERVIEW PHOTOGRAPHS – USARC (MB)

North Elevation Area E

Northeast Elevation Area E

Partial East Elevation Area E looking South

Partial East Elevation Area E

East Elevation Area D

Partial East Elevation Area A looking South

Area A – Soffit looking South

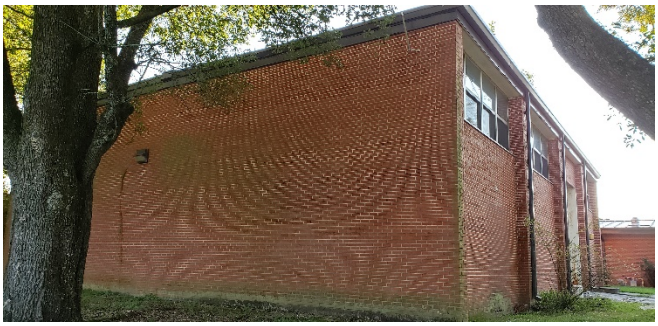
Area A – Damaged soffit

Partial East Elevation Area A looking North

South Elevation Area A looking West

West Elevation Area E

South Elevation Area C looking North



Partial West Elevation Area C looking

West Elevation Areas C, E

West Elevation Area E

Area E looking North

Area E looking North

Area E looking North – Note trees to trim back from roof

Area E looking North

Area E looking North – Note trees to trim back from roof

Area E looking East

Area E looking South

Area E looking Southwest

Area E – Typical penetrations

Area E – Roof drain

Area E – Typical penetrations

Area D looking Southeast

Area A looking South

Area A looking Southeast

Area A looking East

Area A looking Northeast

Area A looking East

Area A - Curbs

Area A - Curbs

Area A - Curbs

Area B looking North

Area B looking South

Area C looking West

Area C looking West

Area C - Penetrations

OVERVIEW PHOTOGRAPHS – OMS

North Elevation Areas F, G

West Elevation Areas F, G

South Elevation Areas F, G

East Elevation Area F

Area F looking East

Area F - Penetrations

Area F - Penetrations

Area F - Penetrations

Area G looking South

Area G

END OF LA012 PHOTOS

US Army Corps of Engineers®

LOUISVILLE DISTRICT

ENGINEERS

NATIONAL ROOFING PROGRAM (NPR)
FY019 PROJECT LA012
US ARMY RESERVE CENTER
1640 SURREY ST. LAFAYETTE, LOUISIANA 70508

SOLICITATION NO.:

CONTRACT NO.:

ISSUE DATE: 17 JULY 2020

VOLUME : NOT APPLICABLE

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
G-001	COVER SHEET
G-002	GENERAL INFORMATION SHEET
A-101	EXISTING, DEMO ROOF PLAN USARC 1
A-102	EXISTING, DEMO ROOF PLAN USARC 2
A-103	EXISTING, DEMO ROOF PLAN OMS
A-104	NEW ROOF PLAN USARC 1
A-105	NEW ROOF PLAN USARC 2
A-106	NEW ROOF PLAN OMS
A-107	INSULATION ATTACHMENT PLAN USARC
A-108	INSULATION ATTACHMENT PLAN OMS
A-501	ROOF DETAILS
A-502	ROOF DETAILS
A-503	ROOF DETAILS
A-504	ROOF DETAILS
A-505	ROOF DETAILS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: 17 JULY 2020
SOLICITATION NO.:
CONTRACT NO.:

DESIGNED BY:	K. PARKER
DRAWN BY:	R. WELLMAN
CHECKED BY:	B. WIGGINS
SUBMITTED BY:	K. PARKER
SIZE:	ANSI D

U.S. ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING PL
LOUISVILLE, KENTUCKY 40202

ROOFING, WATERPROOFING & BUILDING ENVELOPE ENGINEERS & CONSULTANTS
2500 CITADEL PLAZA DRIVE, SUITE 15
CHARLESTON, SOUTH CAROLINA 29407
www.reiengineers.com

NATIONAL ROOFING PROGRAM (NPR)
FY019 PROJECT LA012
US ARMY RESERVE CENTER
1640 SURREY ST. LAFAYETTE, LOUISIANA 70508

COVER SHEET

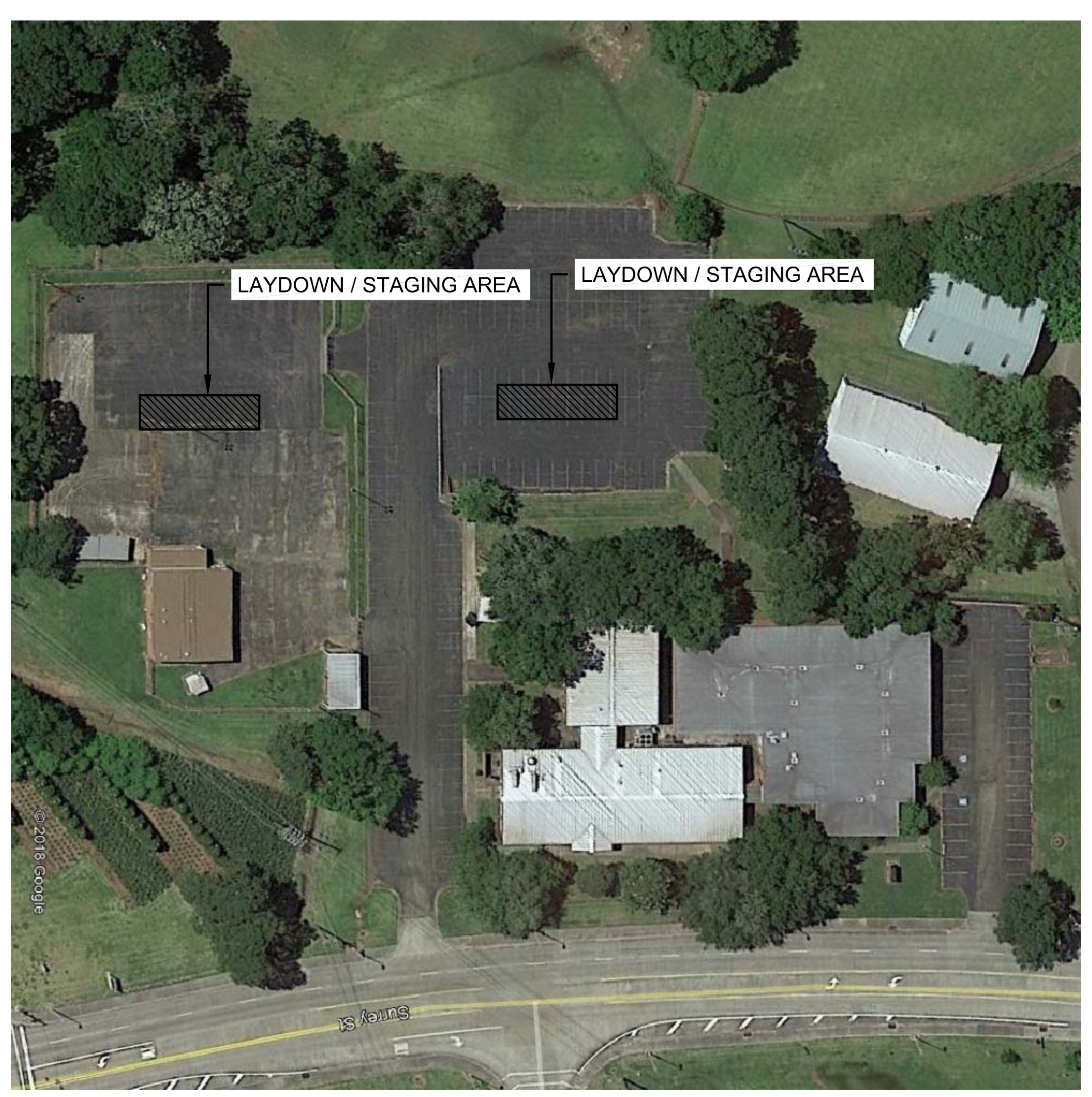
SHEET ID

G-001

CERTIFIED FINAL

SITE AND STAGING

1. NORMAL WORKING HOURS 0730 - 1630 MONDAY THROUGH FRIDAY.
2. NOTIFY MANAGEMENT AT THE START AND COMPLETION OF EACH WORK DAY.
3. CONTRACTOR MUST COORDINATE SCAFFOLDING SETUP AND LAYDOWN AREA WITH CONTRACTING OFFICER TO OBTAIN AN APPROVAL SITE PLAN.



STAGING AREA

SCOPE OF WORK

1. USARC (MB)

AREAS A, C: REMOVE AND DISPOSE OF THE EXISTING RETROFIT METAL ROOF SYSTEM INCLUDING ZEE PURLINS, FLASHINGS AND SHEET METAL DOWN TO THE EXISTING GYPSUM DECK; REPAIR ANY DAMAGED DECKING; RESECURE EXISTING NAILERS TO REMAIN IN PLACE; INSTALL NEW WOOD NAILERS; MECHANICALLY ATTACH BASE SHEET; INSTALL SPECIFIED INSULATION SYSTEM, COVERBOARD AND MODIFIED BITUMEN BASE PLY AND BASE PLY FLASHINGS IN HOT ASPHALT; TORCH APPLY MODIFIED BITUMEN CAP SHEET AND CAP PLY FLASHINGS; INSTALL ALL ACCESSORIES, NEW GUTTERS, DOWNSPOUTS AND SPLASH BLOCKS AND PROVIDE NEW SHEET METAL FLASHINGS AND TRIM TO PROVIDE A COMPLETE ROOF ASSEMBLY IN COMPLIANCE WITH THE PLANS AND SPECIFICATIONS.

AREA B: REMOVE AND DISPOSE OF THE EXISTING RETROFIT METAL ROOF SYSTEM INCLUDING ZEE PURLINS, FLASHINGS AND SHEET METAL DOWN TO THE EXISTING CONCRETE DECK; RESECURE EXISTING NAILERS TO REMAIN IN PLACE; INSTALL NEW WOOD NAILERS; PRIME CONCRETE DECKING AND INSTALL SPECIFIED VAPOR BARRIER, SPECIFIED INSULATION SYSTEM, COVERBOARD, MODIFIED BITUMEN BASE PLY AND BASE PLY FLASHINGS IN HOT ASPHALT; TORCH APPLY MODIFIED BITUMEN CAP SHEET AND CAP PLY FLASHINGS; INSTALL ALL ACCESSORIES, NEW GUTTERS, DOWNSPOUTS AND SPLASH BLOCKS AND PROVIDE NEW SHEET METAL FLASHINGS AND TRIM TO PROVIDE A COMPLETE ROOF ASSEMBLY IN COMPLIANCE WITH THE PLANS AND SPECIFICATIONS.

AREA D: REMOVE AND DISPOSE OF EXISTING MODIFIED BITUMEN ROOF SYSTEM INCLUDING INSULATION, FLASHINGS AND SHEET METAL DOWN TO EXISITNG METAL ROOF "R" PANELS; INSTALL CUSTOM CUT FLUTE-FILL INSULATION OVER EXISTING METAL ROOF PANELS; MECHANICALLY ATTACH COVERBOARD INSULATION; INSTALL MECHANICALLY ATTACHED, INDUCTION WELDED THERMOPLASTIC SINGLE-PLY PVC MEMBRANE; INSTALL ALL ACCESSORIES, NEW GUTTERS, DOWNSPOUTS AND SPLASH BLOCKS AND PROVIDE NEW SHEET METAL FLASHINGS AND TRIM TO PROVIDE A COMPLETE ROOF ASSEMBLY IN COMPLIANCE WITH THE PLANS AND SPECIFICATIONS.

AREA E: REMOVE AND DISPOSE OF THE EXISTING ROOF SYSTEM INCLUDING FLASHINGS AND SHEET METAL DOWN TO THE EXISTING METAL DECK; REPAIR ANY DAMAGED DECKING; RESECURE EXISTING NAILERS TO REMAIN IN PLACE; MECHANICALLY ATTACH BASE LAYER OF INSULATION; INSTALL REMAINDER OF SPECIFIED INSULATION, COVERBOARD AND MODIFIED BITUMEN BASE PLY AND BASE PLY FLASHINGS IN HOT ASPHALT; TORCH APPLY MODIFIED BITUMEN CAP SHEET AND CAP PLY FLASHINGS; INSTALL ALL ACCESSORIES AND PROVIDE NEW SHEET METAL FLASHINGS AND TRIM TO PROVIDE A COMPLETE ROOF ASSEMBLY IN COMPLIANCE WITH THE PLANS AND SPECIFICATIONS.

2. OMS (MB)

AREAS F, G: REMOVE AND DISPOSE OF THE EXISTING ROOF SYSTEM INCLUDING FLASHINGS AND SHEET METAL DOWN TO THE EXISTING GYPSUM AND PLYWOOD DECK; REPAIR ANY DAMAGED DECKING; RESECURE EXISTING NAILERS TO REMAIN IN PLACE; MECHANICALLY ATTACH BASE LAYER OF INSULATION; INSTALL REMAINDER OF SPECIFIED INSULATION, COVERBOARD AND MODIFIED BITUMEN BASE PLY AND BASE PLY FLASHINGS IN HOT ASPHALT; TORCH APPLY MODIFIED BITUMEN CAP SHEET AND CAP PLY FLASHINGS; INSTALL ALL ACCESSORIES AND PROVIDE NEW SHEET METAL FLASHINGS AND TRIM TO PROVIDE A COMPLETE ROOF ASSEMBLY IN COMPLIANCE WITH THE PLANS AND SPECIFICATIONS.

INSTALL NEW LADDER BRACKET'S ON EXTERIOR WALL WHERE SHOWN.

ABBREVIATIONS

BLDG	BUILDING
CJ	CONTROL JOINT
DWG	DRAWING
ECP	ENTRY CONTROL POINT
FAC	FACILITY
GEJ	GUTTER EXPANSION JOINT
MAX.	MAXIMUM
MIN.	MINIMUM
N.I.C.	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
NO.	NUMBER
OF	OVERFLOW
O.C.	ON CENTER
S.S.	STAINLESS STEEL
SSMR	STANDING SEAM METAL ROOF
SIM.	SIMILAR
TERM.	TERMINATION
TYP.	TYPICAL

GENERAL (ROOFING) NOTES

1. ALL DIMENSIONS DEPICTED IN THE CONTRACT DOCUMENTS ARE TO BE CONSIDERED APPROXIMATE AND ARE GIVEN FOR PRICING PURPOSES ONLY; THE DIMENSIONS DEPICTED ARE NOT TO BE CONSIDERED "ACTUAL" FOR MANUFACTURING PURPOSES. DUE TO THE NATURE OF RENOVATING EXISTING CONDITIONS, IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL CONDITIONS AND REQUIREMENTS, WHERE WORK IS TO BE EXECUTED, PRIOR TO THE COMMENCEMENT OF WORK; FIELD VERIFICATION SHALL BE REQUIRED FOR ANY DEMOLITION OF EXISTING CONDITIONS, AS WELL AS BEFORE ORDERING MATERIALS AND INSTALLATION OF PRODUCTS.
2. DIMENSIONS SHOWN ON THE FLOOR PLANS ARE TO FACE OF STUD WALLS, TO CENTERLINE OF COLUMNS, TO FACE OF CONCRETE OR MASONRY WALLS OR TO FIN. FACE OF EXISTING CONSTRUCTION UNLESS OTHERWISE INDICATED.
3. SHOP DRAWINGS PRODUCED FOR THIS PROJECT WILL INCLUDE PRODUCT DATA AND INSTRUCTIONS FOR INSTALLATION OF ALL FASTENERS, AS WELL AS FASTENER SPACING, PULL OUT DATA, DIAMETER EMBEDMENT, AND MATERIAL. DEVELOP SHOP DRAWINGS FOR ALL FASTENER CONDITIONS AND SUBMIT FOR REVIEW. ANY INSTALLATION PRIOR TO THE RECEIPT OF APPROVED SHOP DRAWINGS IS AT THE SOLE RISK OF THE CONTRACTOR. SEE PROJECT SPECIFICATIONS FOR ADDITIONAL SUBMITTAL REQUIREMENTS.
4. THE CONTRACTOR WILL MAINTAIN A CLEAN, SAFE AND SECURE SITE AND PROVIDE DAILY CLEAN UP.
5. AT THE COMPLETION OF CONSTRUCTION, CONTRACTORS STAGING AND/ OR LAY DOWN AREAS WILL BE RETURNED TO ORIGINAL CONDITIONS UNLESS OTHERWISE NOTED.
6. SECURE ALL CONSTRUCTION LOCATIONS AT ALL TIMES.
7. THE CONTRACTOR'S WORK PLAN MUST BE SUBMITTED TO THE CONTRACTING OFFICER FOR REVIEW AND APPROVAL.
8. CONTRACTOR ASSUMES FINANCIAL RESPONSIBILITY FOR ALL DAMAGE AS A RESULT OF LEAKS/ WATER INTRUSION FROM CONSTRUCTION ACTIVITIES.
9. CONTRACTOR WILL COORDINATE ALL ACTIVITIES THAT GENERATE NOXIOUS ODORS WITH OWNER'S REPRESENTATIVE SO AS TO MINIMIZE THE NEGATIVE EFFECTS OF FUMES.
10. CONTRACTOR SHALL REMOVE, HAUL AWAY, AND DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH LOCAL CODES AND ORDINANCES, INCLUDING HAZARDOUS MATERIALS.
11. DEMOLISH IN AN ORDERLY AND CAREFUL MANNER. NEATLY AND ACCURATELY CUT EXISTING CONSTRUCTION TO LIMITS NECESSARY TO ACCOMMODATE NEW CONSTRUCTION.
12. THE CONTRACTOR WILL ONLY USE REMOVAL AND INSTALLATION METHODS THAT MINIMIZE FALLING DUST AND DEBRIS.
13. CONTRACTOR SHALL NOT UTILIZE MOTORIZED MECHANICAL EQUIPMENT TO REMOVE EXISTING ROOF AND OTHER LAYERS TO AVOID DUSTING AND DISTURBING OCCUPANTS OF THE FACILITY. ALL MATERIALS FOR DEMOLITION SHOULD BE CUT TO MANAGEABLE PIECES, MANUALLY REMOVED AND HAULED AWAY. CONTRACTOR IS TO PRESENT A DEMOLITION PLAN WITH PROPOSED TECHNIQUES TO THE CONTRACTING OFFICER FOR APPROVAL.
14. PHASE AND INSTALL THE WORK TO MAINTAIN POSITIVE DRAINAGE TO AVOID PONDING AT ALL TIMES.
15. CONTRACTOR WILL DRY-IN WEATHER TIGHT ALL AREAS OF WORK DAILY IN ORDER TO PROTECT THE EXISTING FACILITY AND EQUIPMENT. MAINTAIN A SECURE AND WATERTIGHT FACILITY THROUGHOUT CONSTRUCTION.
16. IF THE CONTRACTOR ENCOUNTERS ANY UNFORESEEN HAZARDOUS SITE CONDITIONS DURING THE PERFORMANCE OF THE CONTRACT, INCLUDING BUT NOT LIMITED TO SUSPECTED ASBESTOS CONTAINING MATERIAL (ACM) OR LEAD-BASED PAINT, THE CONTRACTOR SHALL CEASE EXECUTION OF WORK/ OPERATIONS IN THE SUSPECTED AREA, IMMEDIATELY EVACUATE ALL PERSONNEL AND NOTIFY THE CONTRACTING OFFICER'S REPRESENTATIVE. VERIFICATION OF THE SUSPECT CONDITION WILL COMMENCE THOUGH SAMPLE AND ANALYSIS BY A CONTRACTOR QUALIFIED FOR SUCH, AS DIRECTED BY THE CONTRACTING OFFICER.
17. MANY OF THE DETAILS CONTAINED HERE-IN ARE DEVELOPED BASED UPON DESIGN PERFORMANCE CRITERIA. MANY DETAILS ARE GENERIC IN NATURE AND DEPENDANT ON THE ACTUAL PRODUCT SELECTION MADE BY THE CONTRACTOR DURING BIDDING AND CONSTRUCTION. WHEN REQUESTED OR REQUIRED BY THE MANUFACTURER DUE TO THE CONFIGURATION OF THEIR PRODUCTS(S), MINOR VARIATIONS FROM THE DETAIL SHOWN WILL BE CONSIDERED WHEN THEY MEET THE REQUIREMENTS OF THE CONTRACT DRAWINGS AND SPECIFICATIONS. THE CONTRACTING OFFICERS'S REPRESENTATIVE WILL DETERMINE THE EQUIVALENCY OF ANY SUCH VARIATION. THE CONTRACTOR WILL SUBMIT AS A MINIMUM THE DETAILS SHOWN WITH ANY VARIATION TO THE DETAILS CONTAINED IN THE CONTRACT DOCUMENTS. IF PROPOSED VARIATIONS TO BE DETAILS ARE NOT ACCEPTED, THE CONTRACTOR WILL EITHER INSTALL THE MATERIAL AS INDICATED ON THE CONTRACT DRAWINGS AND SPECIFICATIONS OR REVISE THE PROPOSED DETAILS AS DIRECTED BY THE CONTRACTING OFFICER'S REPRESENTATIVE. ANY ACCEPTED CHANGES TO THE CONTRACT DOCUMENTS WILL BE PERFORMED AT NO ADDITIONAL COST TO THE GOVERNMENT.
18. THE ARCHITECT IS RESPONSIBLE FOR THE DESIGN RELATIVE TO THE IDENTIFIED CODES AND TO THE DEGREE THAT THE SCOPE INCLUDES ON SITE OBSERVATION DURING CONSTRUCTION, REVIEWS ENSURE THE INSTALLATION IS IN CONFORMANCE WITH THE DESIGN. THE ARCHITECT SPECIFICALLY IS NOT RESPONSIBLE FOR THE MEANS AND METHODS INCLUDING SAFETY MEASURES USED BY THE CONTRACTOR TO COMPLETE THE WORK.
19. CONTRACTOR SHALL LIMIT ROOF LOADING TO THE MAXIMUM EXTENT POSSIBLE. MAX LOAD OF CONSTRUCTION MATERIALS NOT TO EXCEED A 20 PSF LIVE LOAD.
20. WHERE ROOFING AND FLASHING DETAILS ARE NOT PROVIDED THE CONTRACTOR WILL PROVIDE DETAILS UTILIZING SMACNA AND NRCA AS MINIMUM STANDARDS FOR DEVELOPMENT OF THE DETAIL; HOWEVER, IN ALL CASES ALL SYSTEMS MUST MEET CURRENT CODES.
21. ALL ROOF COMPONENTS SHALL BE DESIGNED TO WITHSTAND THE WIND LOADS INDICATED ON THE DRAWINGS. PULL OUT TEST USING PROPOSED FASTENERS MUST BE PERFORMED PRIOR TO THE DEVELOPMENT OF SHOP DRAWINGS. RESULTS MUST BE SUBMITTED WITH SHOP DRAWINGS. WIND SPEED WARRANTIES ARE INCLUDED. WIND SPEED WARRANTIES EXCLUDE FAILURE OF THE EXISTING DECK TO REMAIN ATTACHED TO THE EXISTING STRUCTURAL SYSTEM.
22. ROOF EQUIPMENT WHICH IS TO REMAIN SHALL REMAIN OPERATIONAL DURING ALL RE-ROOFING ACTIVITIES. PROVIDE TEMPORARY SUPPORTS, TEMPORARY WATERPROOFING AND OTHER TEMPORARY SERVICE AS REQUIRED TO AVOID DISTURBING OCCUPANTS.
23. IN NO CASE WILL LENGTHS OF FLASHING UNDER 24 INCHES BE ALLOWED. IN ALL CASES FASTENERS WILL BE PLACED STARTING WITHIN 2 INCHES OF THE EDGE OF EACH PIECE OF FLASHING.
24. ALL EXISTING EQUIPMENT AND FINISHES TO REMAIN SHALL BE PROTECTED FROM DAMAGE AT ALL TIMES DURING DEMOLITION AND CONSTRUCTION. CONSTRUCTION COMPONENTS WHICH ARE TO REMAIN THAT ARE DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED, PATCHED, OR REPLACED TO MATCH ADJOINING WORK AT NO ADDITIONAL COST.
25. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CONTRACTING OFFICER OF CORRODED OR DETERIORATED CONDITIONS EXPOSED DURING DEMOLITION AND CONSTRUCTION. REPAIRS OF CONCEALED CONDITIONS ARE NOT INCLUDED IN THE RENOVATION SCOPE OF WORK UNLESS SPECIFICALLY NOTED.

GRAPHICS LEGEND

SECTION/ DETAIL INDICATOR

X# — SECTION/ DETAIL NUMBER
X-### — SHEET WHERE LOCATED

ENLARGED PLAN/ DETAIL INDICATOR

X# — ENLARGED PLAN/ DETAIL NUMBER
X-### — SHEET WHERE LOCATED

DRAWING TITLE

PLAN/ DETAIL NUMBER
PLAN/ DETAIL TITLE
A1 FLOOR PLAN
SCALE: 1/16" = 1' - 0"
0 8' 16' 32'
PLAN/ DETAIL SCALE
GRAPHIC SCALE

NORTH ARROWS

PLAN NORTH
PLAN/ PROJECT NORTH
TRUE/ ACTUAL NORTH (MAY NOT BE SHOWN IF PLAN/ PROJECT NORTH IS THE SAME)

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE: 17 JULY 2020
SOLICITATION NO.:
CONTRACT NO.:
DESIGNED BY: K. PARKER
DRAWN BY: R. WELLMAN
CHECKED BY: B. WIGGINS
SUBMITTED BY: K. PARKER
SIZE: ANSI D

U.S. ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING PL
LOUISVILLE, KENTUCKY 40202

REI ENGINEERS
ROOFING, WATERPROOFING & BUILDING ENVELOPE ENGINEERS & CONSULTANTS
2090 EXECUTIVE HALL ROAD, SUITE 115
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www.reiengineers.com

NATIONAL ROOFING PROGRAM (NPR)
FY019 PROJECT LA012
US ARMY RESERVE CENTER
1640 SURREY ST. LAFAYETTE, LOUISIANA 70508

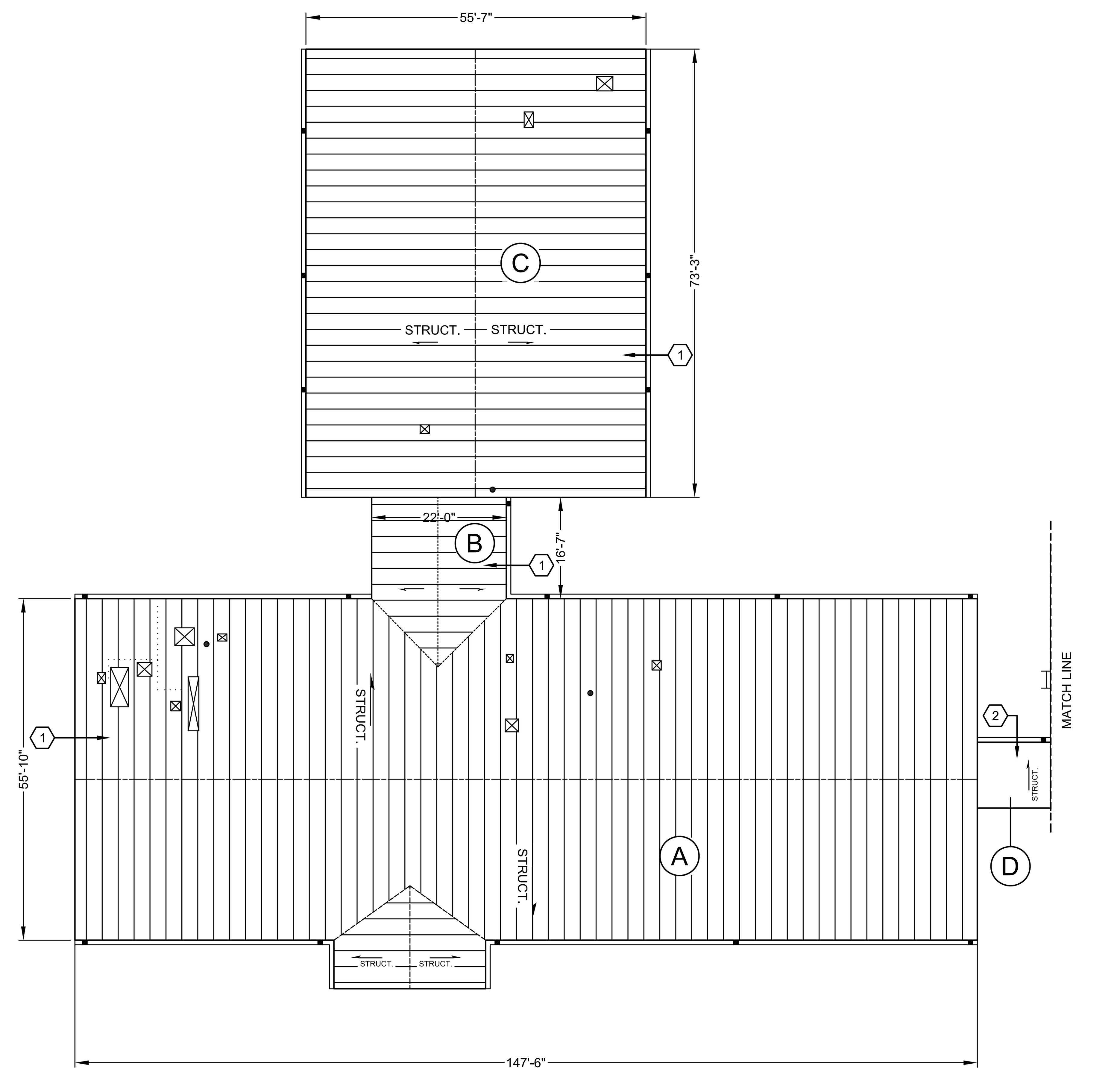
GENERAL INFORMATION SHEET

SHEET ID
G-002

CERTIFIED FINAL

LEGEND

(A)	ROOF AREA DESIGNATOR
STRUCT. →	STRUCTURAL SLOPE INDICATOR
—— – ——	RIDGE/ HIP/ VALLEY
•	PIPE PENETRATION
⊠	EQUIPMENT CURB
	ROOF EDGE
	ROOF EDGE WITH GUTTER AND DOWNSPOUT
···········	GAS LINE
⊢⊣	ROOF ACCESS LADDER



PLAN NORTH

A4 EXISTING, DEMO ROOF PLAN USARC (MB)

SCALE: 1/16" = 1'-0"

0 8' 16' 32'

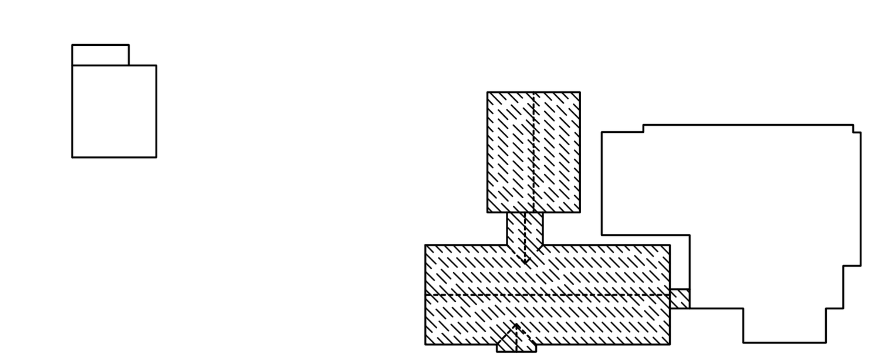
GENERAL SHEET NOTES

1. EXISTING CONDITIONS ROOF AREA A, C
   3 INCH STANDING SEAM, 24 INCH TRAPEZOIDAL METAL ROOF PANEL
   FIBERGLASS BATT INSULATION FILL
   4 INCH RETROFIT ZEE PURLINS
   NOMINAL 2X WOOD BLOCKING
   GYPSUM OVER FORM BOARD
2. EXISTING CONDITIONS ROOF AREA B
   3 INCH STANDING SEAM, 24 INCH TRAPEZOIDAL METAL ROOF PANEL
   FIBERGLASS BATT INSULATION FILL
   4 INCH RETROFIT ZEE PURLINS
   5 NOMINAL 2X WOOD BLOCKING
   TWO LAYERS 30# FELT
   CONCRETE DECKING
3. EXISTING CONDITIONS ROOF AREA D
   GRANULAR SURFACED TWO-PLY MODIFIED BITUMEN
   1/4" GYPSUM COVERBOARD
   1-1/2" POLYISOCYANURATE FLUTE FILL
   METAL ROOF R-PANEL
   FIBERGLASS BATT
   STRUCTURAL PURLINS

(#) SHEET KEY NOTES

1. DEMO EXISTING RETROFIT METAL ROOF SYSTEM.
2. DEMO EXISTING MODIFIED BITUMEN ROOF SYSTEM DOWN TO EXISTING METAL ROOF PANELS.

OVERALL KEY



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LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING PL
LOUISVILLE, KENTUCKY 40202

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ROOFING, WATERPROOFING & BUILDING ENVELOPE ENGINEERS & CONSULTANTS
2090 EXECUTIVE HALL ROAD, SUITE 115
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www.reiengineers.com

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FY019 PROJECT LA012
US ARMY RESERVE CENTER
1640 SURREY ST. LAFAYETTE, LOUISIANA 70508

EXISTING, DEMO ROOF PLAN USARC (MB)

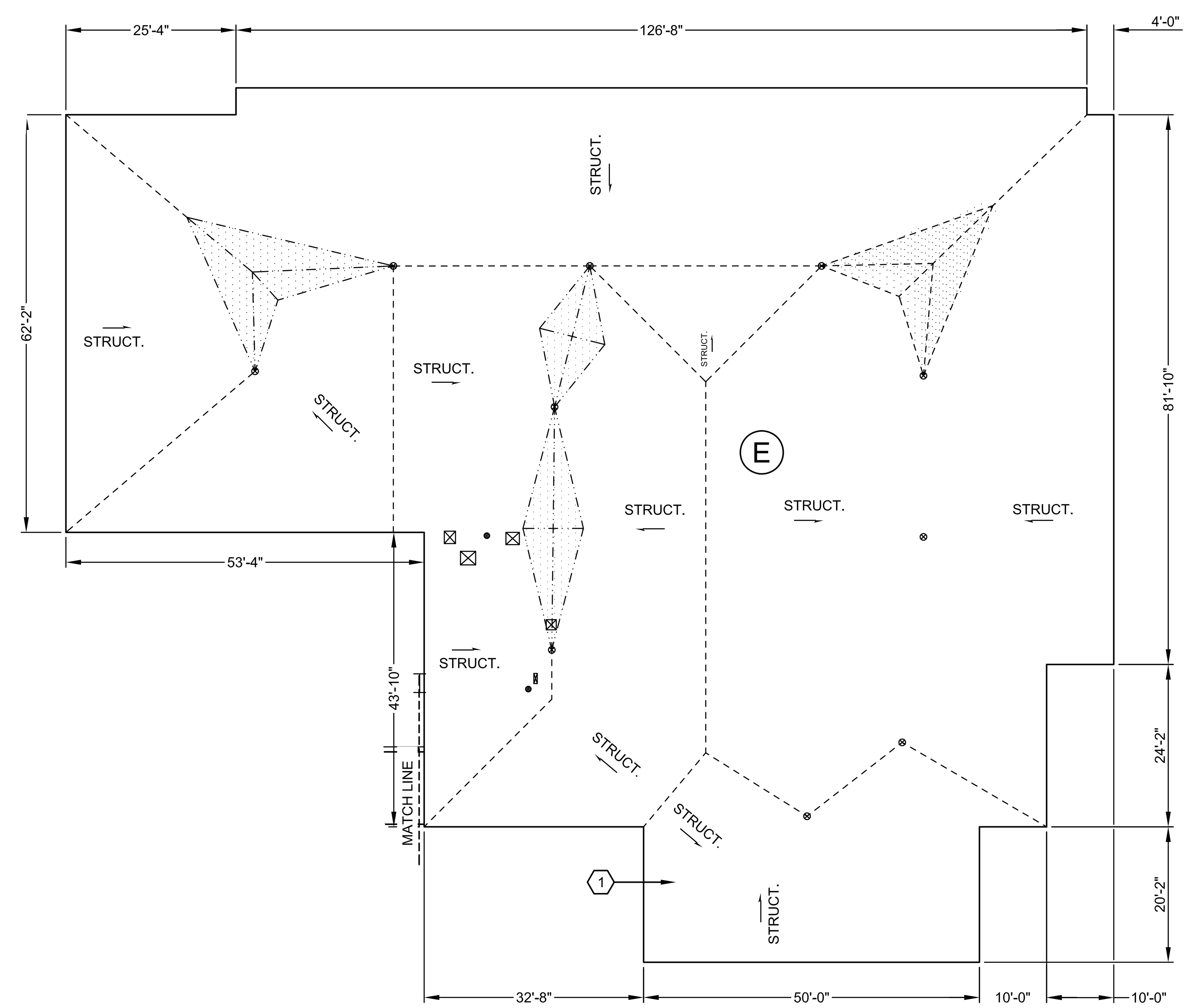
SHEET ID

A-101

CERTIFIED FINAL

LEGEND

- (A) ROOF AREA DESIGNATOR
- STRUCT. → STRUCTURAL SLOPE INDICATOR
- TAPERED INSULATION
- TAPERED SLOPE DIRECTION
- ROOF DRAIN
- PIPE PENETRATION
- EQUIPMENT CURB
- ROOF EDGE
- ROOF EDGE WITH GUTTER AND DOWNSPOUT
- ROOF ACCESS LADDER
- RIDGE/ HIP/ VALLEY



A4 EXISTING, DEMO ROOF PLAN USARC (MB)

SCALE:1/16" = 1'-0"

PLAN NORTH

0 8' 16' 32'

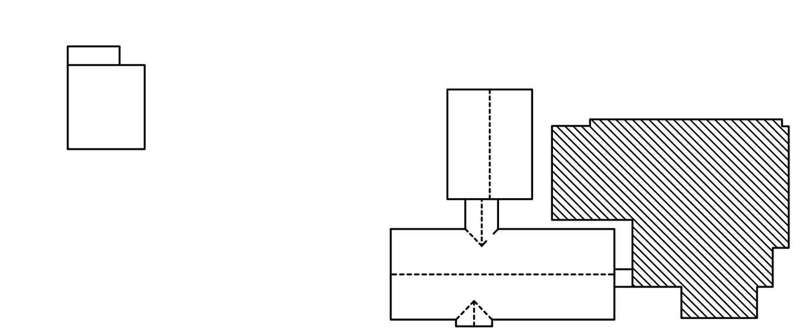
GENERAL SHEET NOTES

1. EXISTING CONDITIONS ROOF AREA E
   GRANULAR SURFACED TWO-PLY MODIFIED BITUMEN
   4 INCH POLYISOCYANURATE
   METAL DECKING

SHEET KEY NOTES

1. DEMO EXISTING MODIFIED BITUMEN ROOF SYSTEM.

OVERALL KEY



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LOUISVILLE, KENTUCKY 40202

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EXISTING, DEMO ROOF PLAN USARC (MB)

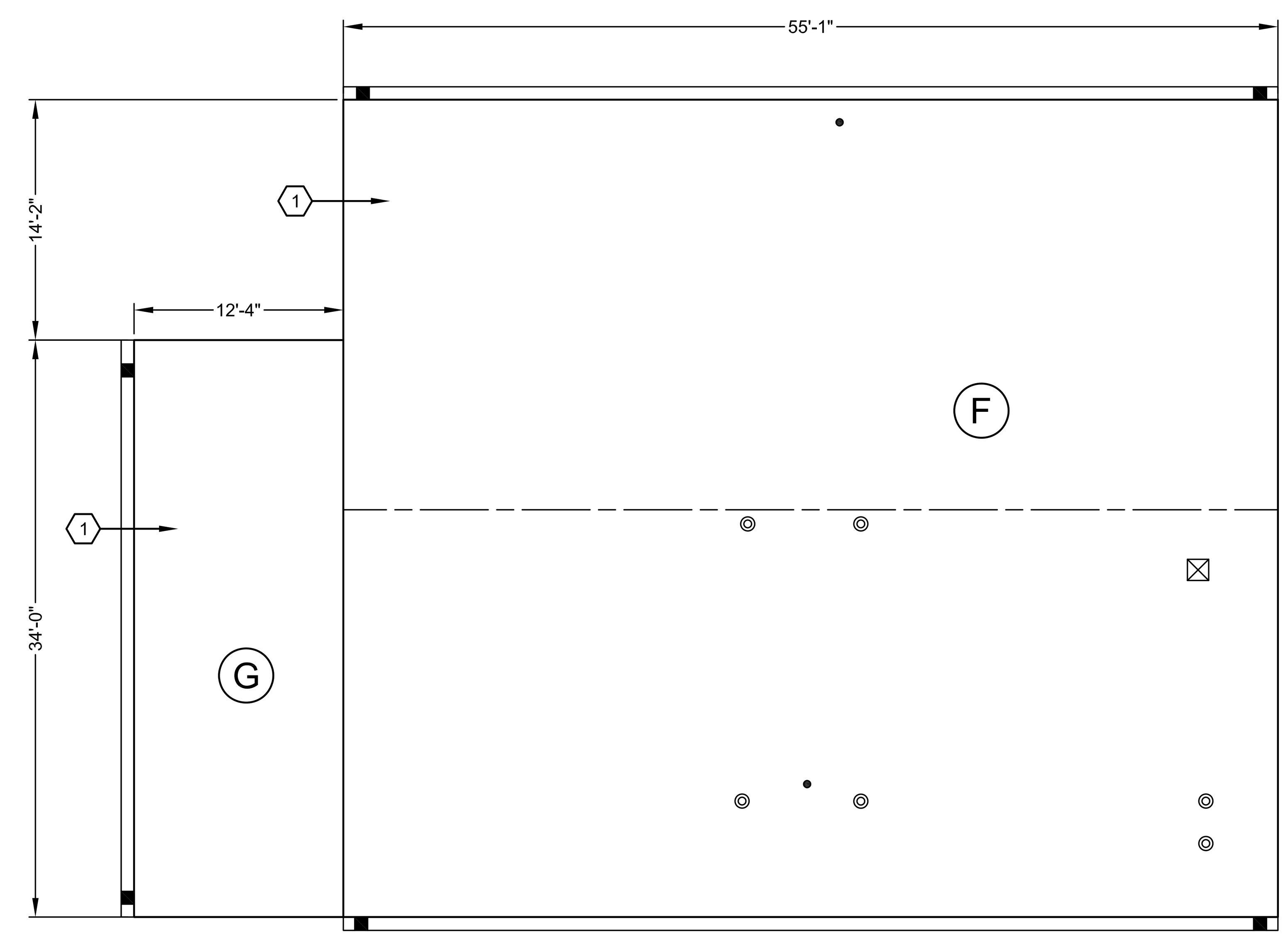
SHEET ID

A-102

CERTIFIED FINAL

LEGEND

(A)	ROOF AREA DESIGNATOR
STRUCT. →	STRUCTURAL SLOPE INDICATOR
→	TAPERED SLOPE DIRECTION
— - —	RIDGE/ HIP/ VALLEY
•	PIPE PENETRATION
◎	ROUND VENTILATOR
⊠	EQUIPMENT CURB
	ROOF EDGE
	ROOF EDGE WITH GUTTER AND DOWNSPOUT



PLAN NORTH

A4 EXISTING, DEMO ROOF PLAN OMS

SCALE: 1/8" = 1'-0"

0 4' 8' 16'

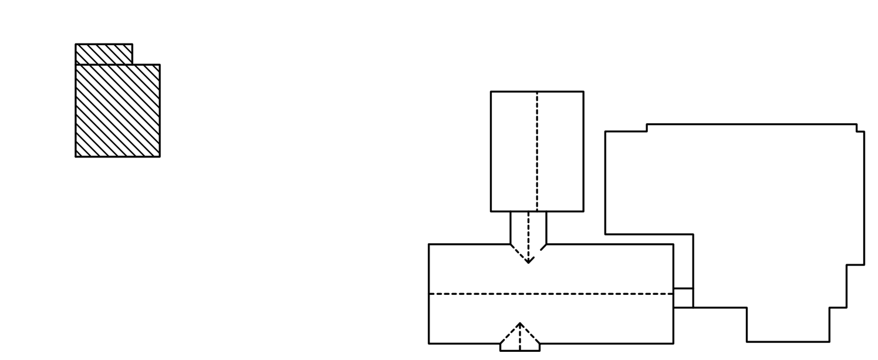
GENERAL SHEET NOTES

1. EXISTING CONDITIONS ROOF AREA F
   GRANULAR SURFACED TWO-PLY MODIFIED BITUMEN
   1 INCH MINERAL PERLITE
   1-3/4" POLYISOCYANURATE INSULATION
   FIBERGLASS BASE SHEET
   PLYWOOD DECKING
2. EXISTING CONDITIONS ROOF AREA G
   GRANULAR SURFACED TWO-PLY MODIFIED BITUMEN
   1 INCH MINERAL PERLITE
   1-3/4" POLYISOCYANURATE INSULATION
   FIBERGLASS BASE SHEET
   GYPSUM OVER FORM BOARD

SHEET KEY NOTES

1. DEMO EXISTING MODIFIED BITUMEN ROOF SYSTEM.

OVERALL KEY



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LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING PL
LOUISVILLE, KENTUCKY 40202

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www.reiengineers.com

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US ARMY RESERVE CENTER
1640 SURREY ST. LAFAYETTE, LOUISIANA 70508

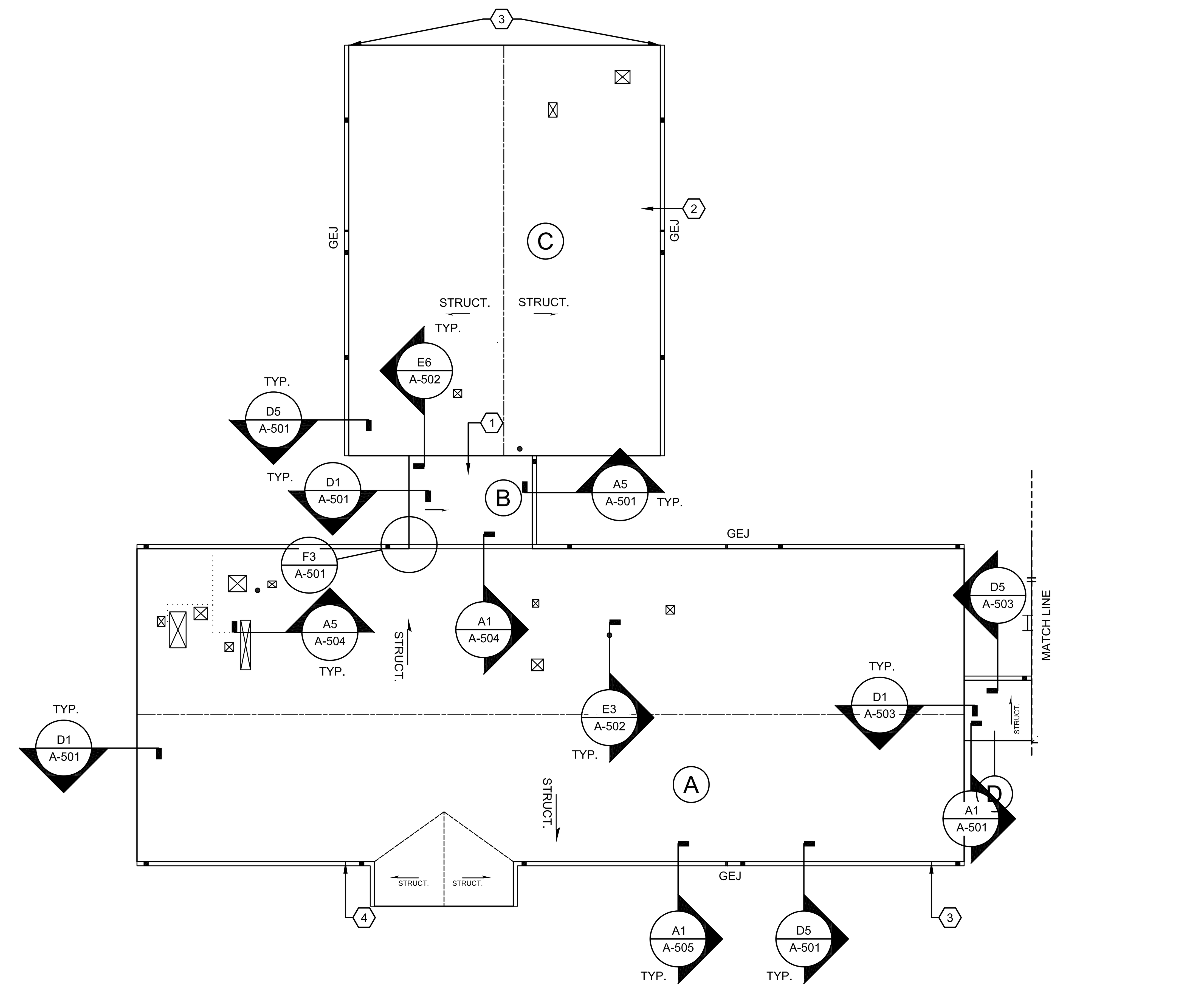
EXISTING, DEMO ROOF PLAN OMS

SHEET ID
A-103

CERTIFIED FINAL

LEGEND

Symbol	Description
(A)	ROOF AREA DESIGNATOR
STRUCT. →	STRUCTURAL SLOPE INDICATOR
→	TAPER SLOPE INDICATOR
— - —	RIDGE/ HIP/ VALLEY
•	PIPE PENETRATION
⊠	EQUIPMENT CURB
	ROOF EDGE
	ROOF EDGE WITH GUTTER AND DOWNSPOUT
GEJ	GUTTER EXPANSION JOINT
⊢⊣	ROOF ACCESS LADDER
···········	GAS LINE



PLAN NORTH

A4 NEW ROOF PLAN USARC (MB)

SCALE: 1/16" = 1'-0"

0 8' 16' 32'

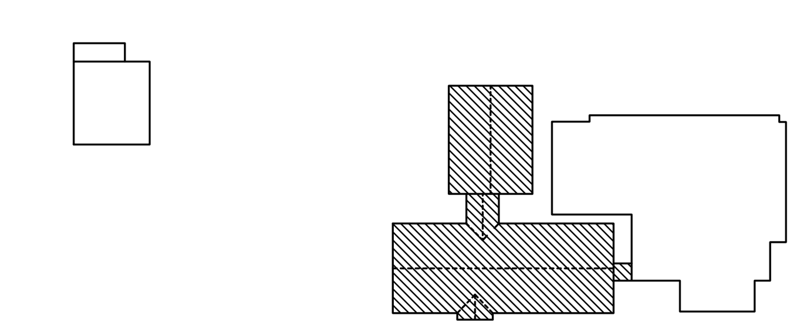
GENERAL SHEET NOTES

1. INCLUDE REPLACEMENT 2% EACH TYPE OF ROOF DECK.
2. ROUTE ALL CONDENSATE LINES TO NEAREST GUTTER OR DRAIN PROVIDE NEW WHERE MISSING.

⟨#⟩ SHEET KEY NOTES

1. SECTOR "B" 1/2" PER FOOT TAPERED INSULATION.
2. SECTOR "C" 1/4" PER FOOT TAPERED INSULATION.
3. TRIM TREES A MINIMUM OF 3' AWAY FROM BUILDING STRUCTURE. CONTRACTOR SHALL COMPLY WITH ANY LOCAL ORDINANCES OR RESTRICTIONS ON THE CUTTING AND/ OR TRIMMING OF TREES, AS WELL AS INCLUDE TREE CUTTING AND/OR TRIMMING IN THEIR ACCIDENT PREVENTION PLAN REGARDING THE SAFE EXECUTION OF TREE TRIMMING.
4. KNOWN DAMAGE TO DECKING.

OVERALL KEY



EQUIPMENT CURB SIZES

CURB SIZE (INCHES)	QUANTITY
106 X 21	1
77 X 35	1
30 X 18	1
35 x 38	1
27 X 29	1
28 X 32	1
24 X 24	1
19 X 19	1
17 X 17	2
21 X 16	1
18 X 14	1
16 X 14	1

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LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING PL
LOUISVILLE, KENTUCKY 40202

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US ARMY RESERVE CENTER
1640 SURREY ST. LAFAYETTE, LOUISIANA 70508

NEW ROOF PLAN USARC (MB)

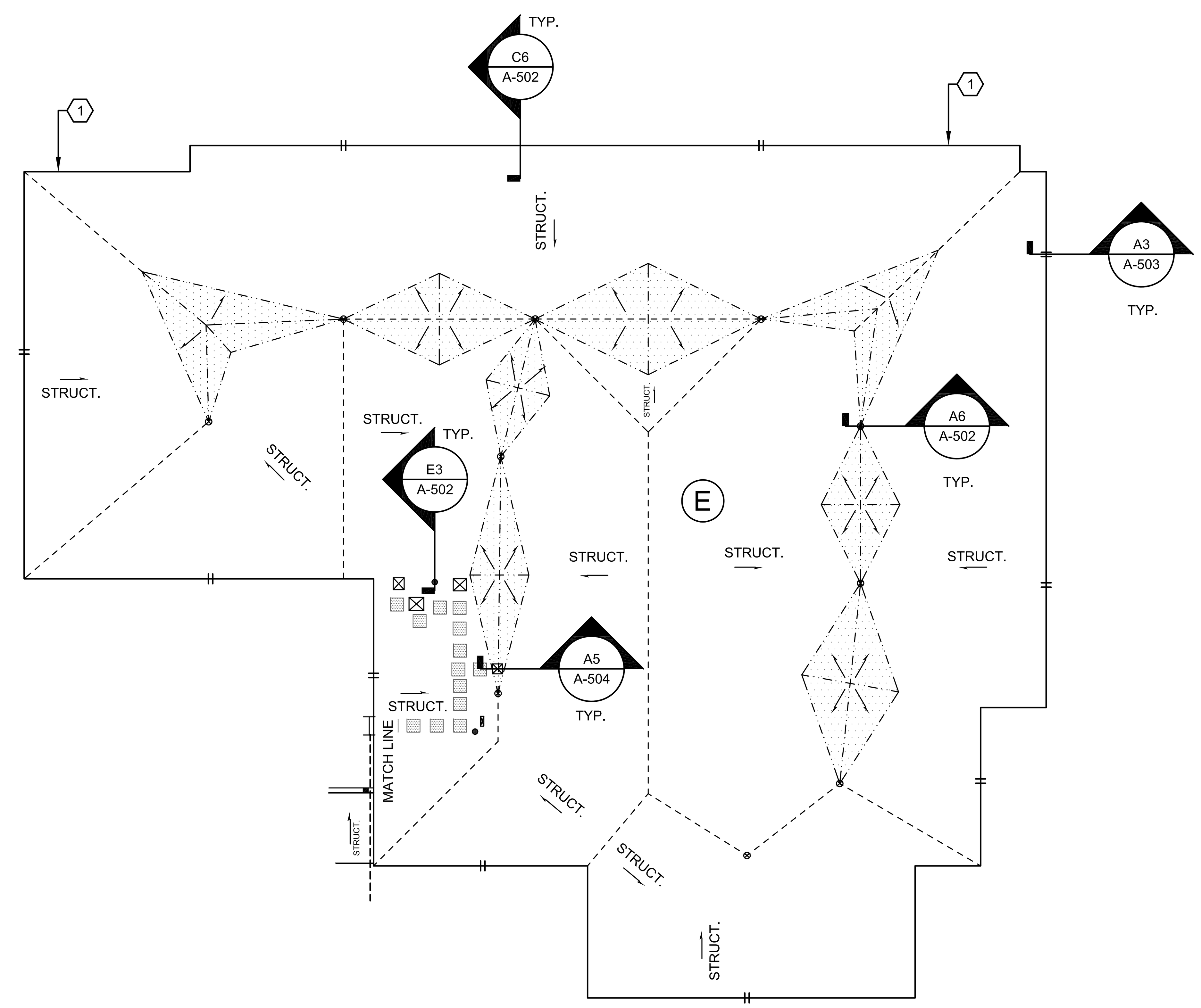
SHEET ID

A-104

CERTIFIED FINAL

LEGEND

Symbol	Description
(A)	ROOF AREA DESIGNATOR
STRUCT. →	STRUCTURAL SLOPE INDICATOR
	TAPERED INSULATION
	TAPERED SLOPE DIRECTION
	ROOF DRAIN
	PIPE PENETRATION
	EQUIPMENT CURB
	ROOF EDGE
	ROOF EDGE WITH GUTTER AND DOWNSPOUT
	THRU-EDGE SCUPPER
	ROOF ACCESS LADDER
	RIDGE/ HIP/ VALLEY
	WALK PAD



A4 NEW ROOF PLAN USARC (MB)

SCALE: 1/16" = 1'-0"

0 8' 16' 32'

PLAN NORTH

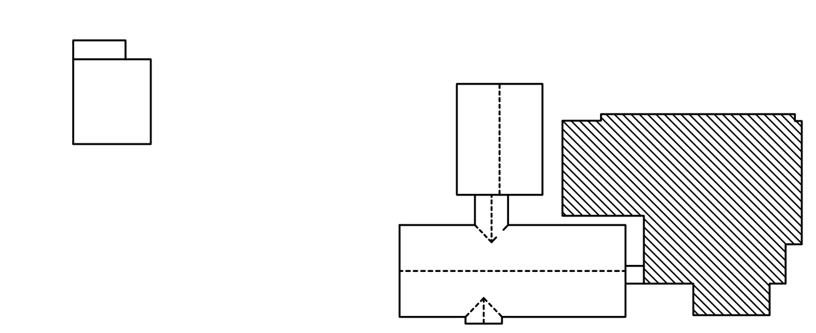
GENERAL SHEET NOTES

1. INCLUDE REPLACEMENT 2% EACH TYPE OF ROOF DECK.
2. ROUTE ALL CONDENSATE LINES TO NEAREST GUTTER OR DRAIN PROVIDE NEW WHERE MISSING.

SHEET KEY NOTES

1. TRIM TREES A MINIMUM OF 3' AWAY FROM BUILDING STRUCTURE. CONTRACTOR SHALL COMPLY WITH ANY LOCAL ORDINANCES OR RESTRICTIONS ON THE CUTTING AND/ OR TRIMMING OF TREES, AS WELL AS INCLUDE TREE CUTTING AND/OR TRIMMING IN THEIR ACCIDENT PREVENTION PLAN REGARDING THE SAFE EXECUTION OF TREE TRIMMING.

OVERALL KEY



EQUIPMENT CURB SIZES

CURB SIZE (INCHES)	QUANTITY
28 x 24	1
24 X 22	1
22 X 20	1
18 X 18	1
18 X 6	1

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LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING PL
LOUISVILLE, KENTUCKY 40202

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www.reiengineers.com

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FY019 PROJECT LA012
US ARMY RESERVE CENTER
1640 SURREY ST. LAFAYETTE, LOUISIANA 70508

NEW ROOF PLAN USARC (MB)

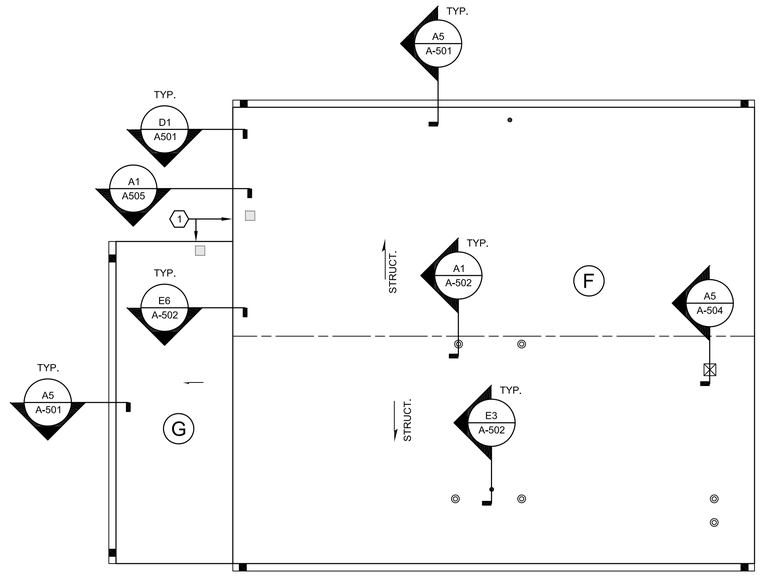
SHEET ID

A-105

CERTIFIED FINAL

LEGEND

(A)	ROOF AREA DESIGNATOR
STRUCT.	STRUCTURAL SLOPE INDICATOR
	TAPERED SLOPE DIRECTION
	RIDGE/ HIP/ VALLEY
	PIPE PENETRATION
	HOT STACK
	EQUIPMENT CURB
	ROOF EDGE
	ROOF EDGE WITH GUTTER AND DOWNSPOUT
GEJ	GUTTER EXPANSION JOINT
	WALK PAD



PLAN NORTH

A4 NEW ROOF PLAN OMS
SCALE: 1/8" = 1'-0"

0 4' 8' 16'

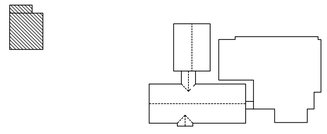
GENERAL SHEET NOTES

1. INCLUDE REPLACEMENT 2% EACH TYPE OF ROOF DECK.
2. ROUTE ALL CONDENSATE LINES TO NEAREST GUTTER OR DRAIN PROVIDE NEW WHERE MISSING.

(#) SHEET KEY NOTES

1. INSTALL NEW LADDER BRACKET.

OVERALL KEY



EQUIPMENT CURB SIZES

CURB SIZE (INCHES)	QUANTITY
16 X 16	1

HOT STACK SIZES

HOT STACK SIZE (INCHES)	QUANTITY
4	1
6	4
9	1

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LOUISVILLE DISTRICT
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LOUISVILLE, KENTUCKY 40202

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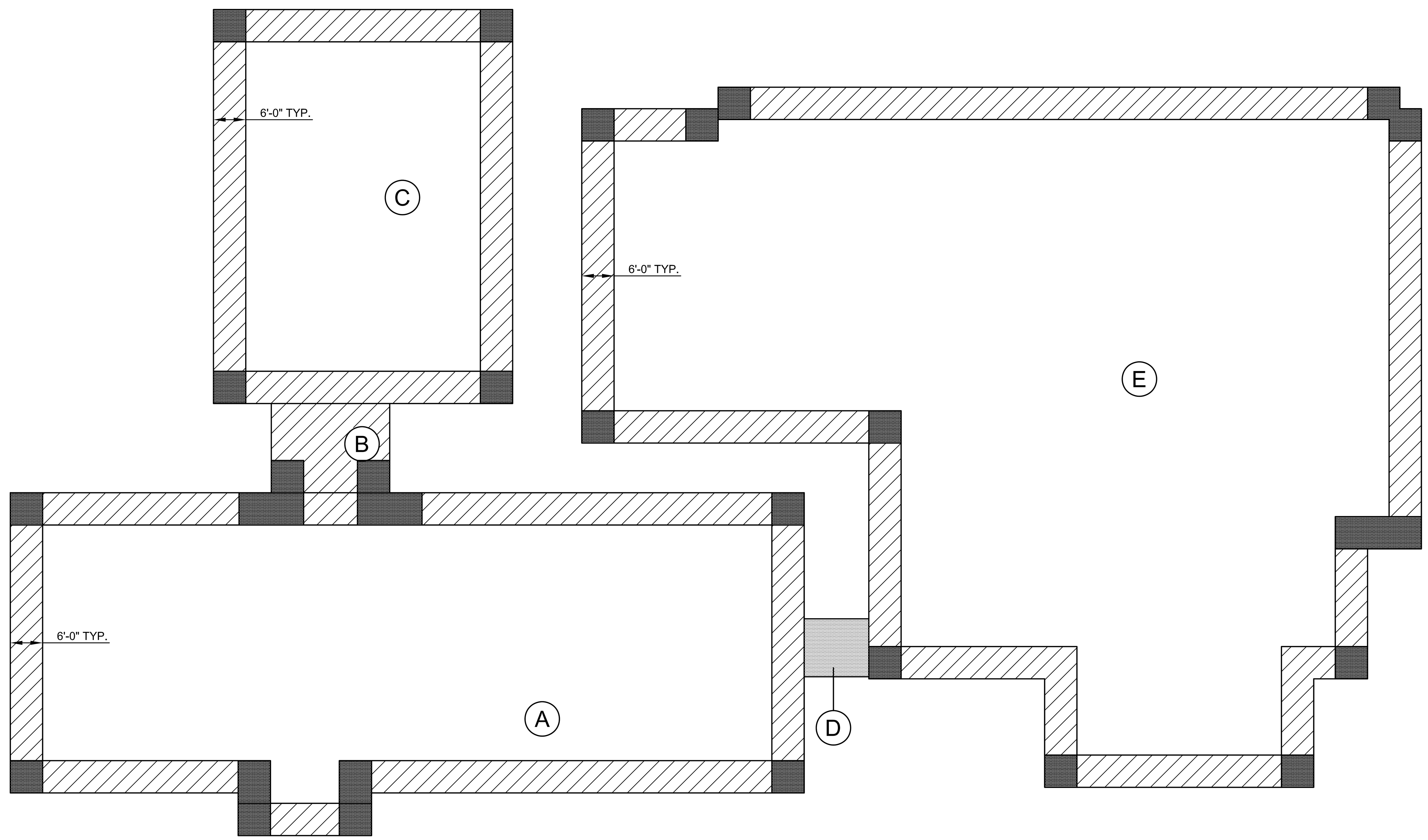
NEW ROOF PLAN OMS

SHEET ID
A-106

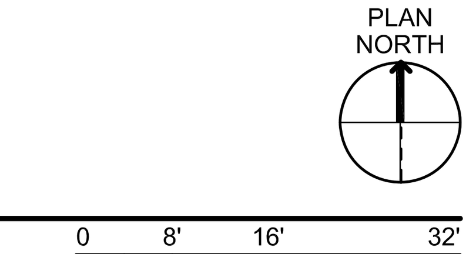
CERTIFIED FINAL



NOTES:
1. PLACEMENT OF INSULATION FASTENERS SHALL COMPLY WITH BOARD MANUFACTURER'S PUBLISHED LITERATURE AND THE MEMBRANE MANUFACTURER'S REQUIREMENTS.
2. CUT OR SCORE BOARDS TO CONFORM TO ANY IRREGULAR SUBSTRATE CONDITIONS.
3. INSTALL NUMBER OF FASTENERS REQUIRED BY MEMBRANE MANUFACTURER'S TESTED ASSEMBLY TO MEET WIND DESIGN UPLIFT PRESSURES SPECIFIED IN SECTION 07 52 16. MINIMUM INSTALLATION PATTERNS SHOWN ON DRAWINGS.

A1 INSULATION ATTACHMENT PLAN USARC (MB)

SCALE: 1/16" = 1'-0"



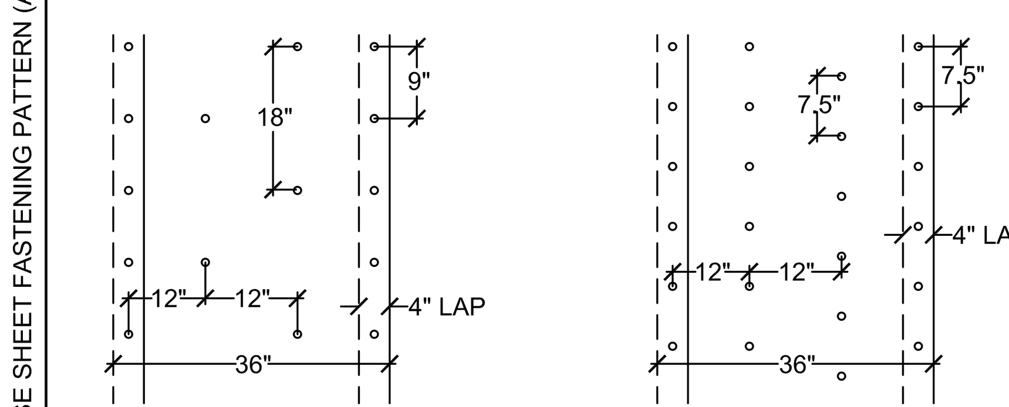
ZONE DATA

SURFACE	PRESSURE (PSF)
ZONE 1 - FIELD	-30.1
ZONE 2 - PERIMETER	-50.5
ZONE 3 - CORNER	-76.0

*ZONE WIDTH = 6'

ZONE 1 - FIELD | ZONE 2 - PERIMETER | ZONE 3 - CORNER

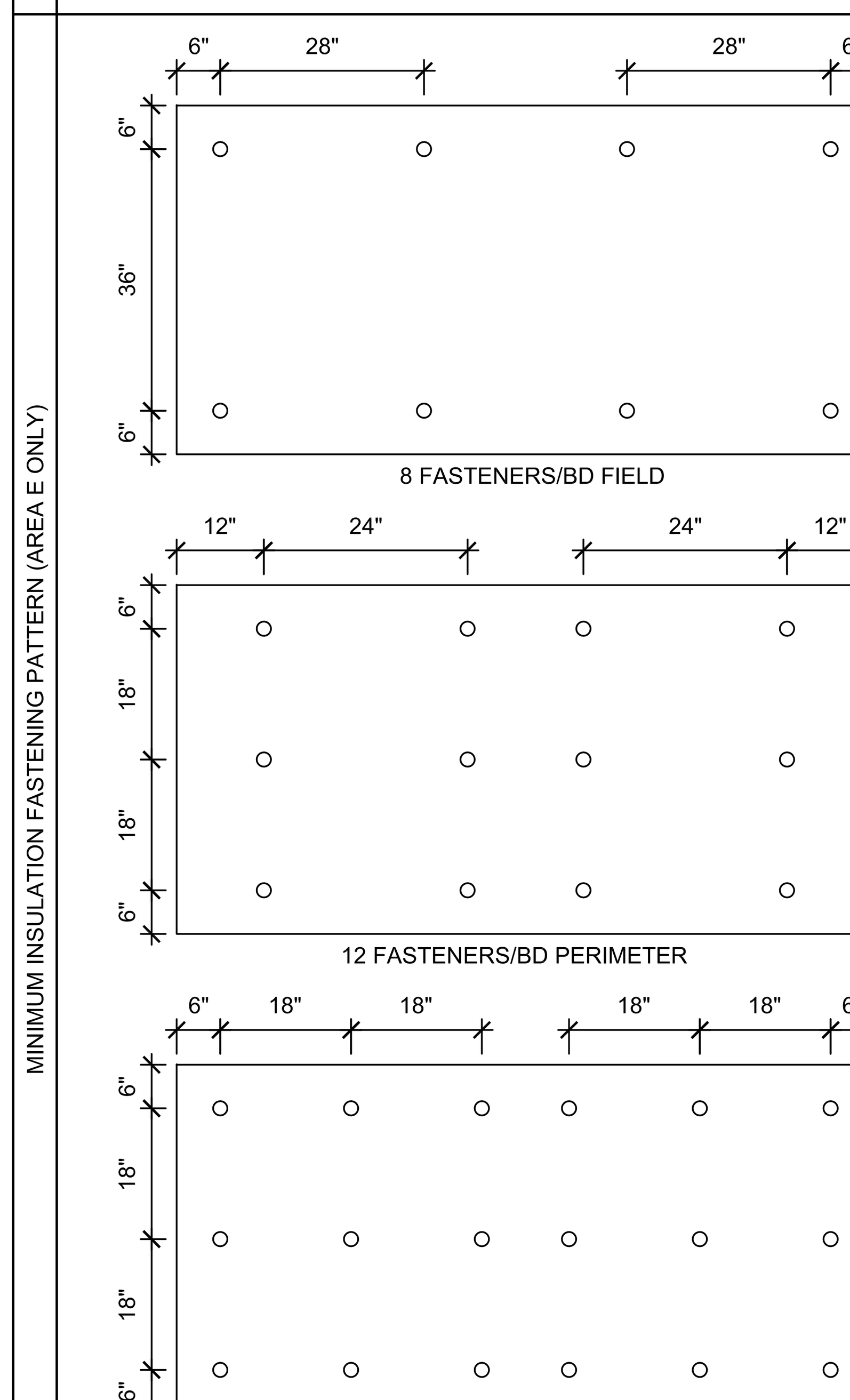
MINIMUM BASE SHEET FASTENING PATTERN (AREAS A,C)



FIELD FASTENING PATTERN

PERIMETER & CORNER FASTENING PATTERN

MINIMUM INSULATION FASTENING PATTERN (AREA E ONLY)



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600 DR. MARTIN LUTHER KING PL
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www.reiengineers.com

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1640 SURREY ST. LAFAYETTE, LOUISIANA 70508

INSULATION ATTACHMENT PLAN USARC (MB)

SHEET ID

A-107

CERTIFIED FINAL

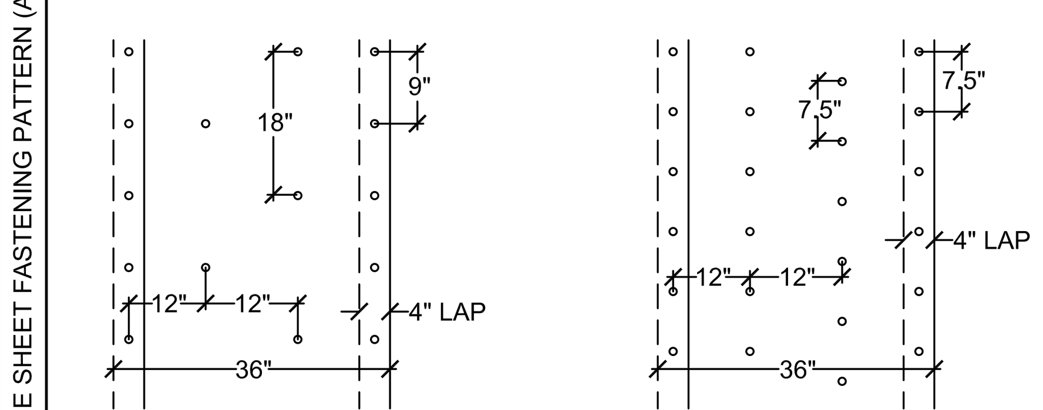
ZONE DATA

SURFACE	PRESSURE (PSF)
ZONE 1 - FIELD	-30.1
ZONE 2 - PERIMETER	-50.5
ZONE 3 - CORNER	-76.0

*ZONE WIDTH = 6'

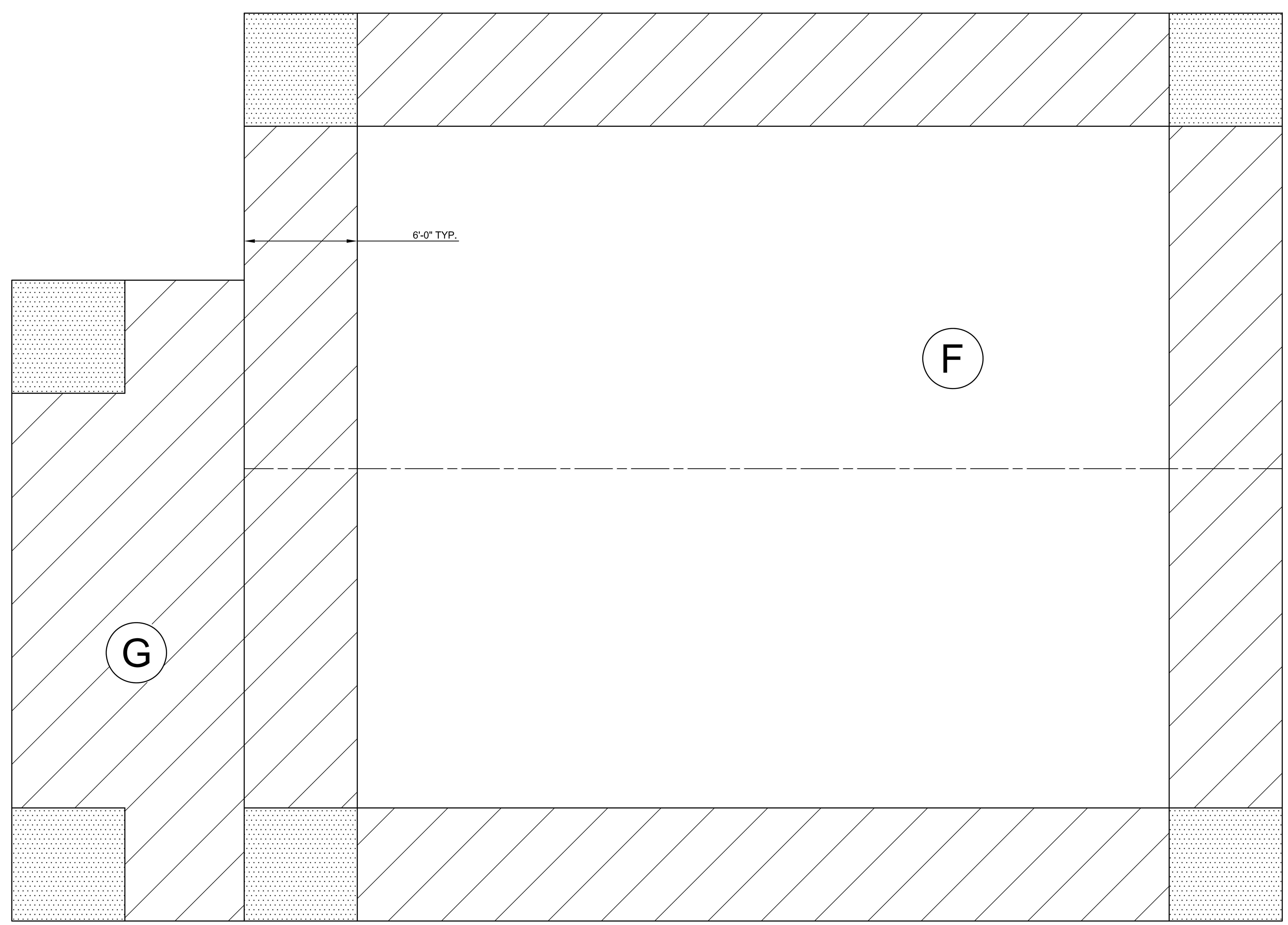
ZONE 1 - FIELD | ZONE 2 - PERIMETER | ZONE 3 - CORNER

MINIMUM BASE SHEET FASTENING PATTERN (AREAS F,G)



FIELD FASTENING PATTERN

PERIMETER & CORNER FASTENING PATTERN



NOTES:
1. PLACEMENT OF INSULATION FASTENERS SHALL COMPLY WITH BOARD MANUFACTURER'S PUBLISHED LITERATURE AND THE MEMBRANE MANUFACTURER'S REQUIREMENTS.
2. CUT OR SCORE BOARDS TO CONFORM TO ANY IRREGULAR SUBSTRATE CONDITIONS.
3. INSTALL NUMBER OF FASTENERS REQUIRED BY MEMBRANE MANUFACTURER'S TESTED ASSEMBLY TO MEET WIND DESIGN UPLIFT PRESSURES SPECIFIED IN SECTION 07 52 16. MINIMUM INSTALLATION PATTERNS SHOWN ON DRAWINGS.

A1 INSULATION ATTACHMENT PLAN OMS

SCALE: 1/4" = 1'-0"

PLAN NORTH

0 2' 4' 8'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: 17 JULY 2020
SOLICITATION NO.:
CONTRACT NO.:

DESIGNED BY: K. PARKER
DRAWN BY: R. WELLMAN
CHECKED BY: B. WIGGINS
SUBMITTED BY: K. PARKER
SIZE: ANSI D

U.S. ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING PL
LOUISVILLE, KENTUCKY 40202

REI ENGINEERS
ROOFING, WATERPROOFING & BUILDING ENVELOPE ENGINEERS & CONSULTANTS
2090 EXECUTIVE HALL ROAD, SUITE 115
CHARLESTON, SOUTH CAROLINA 29407
www.reiengineers.com

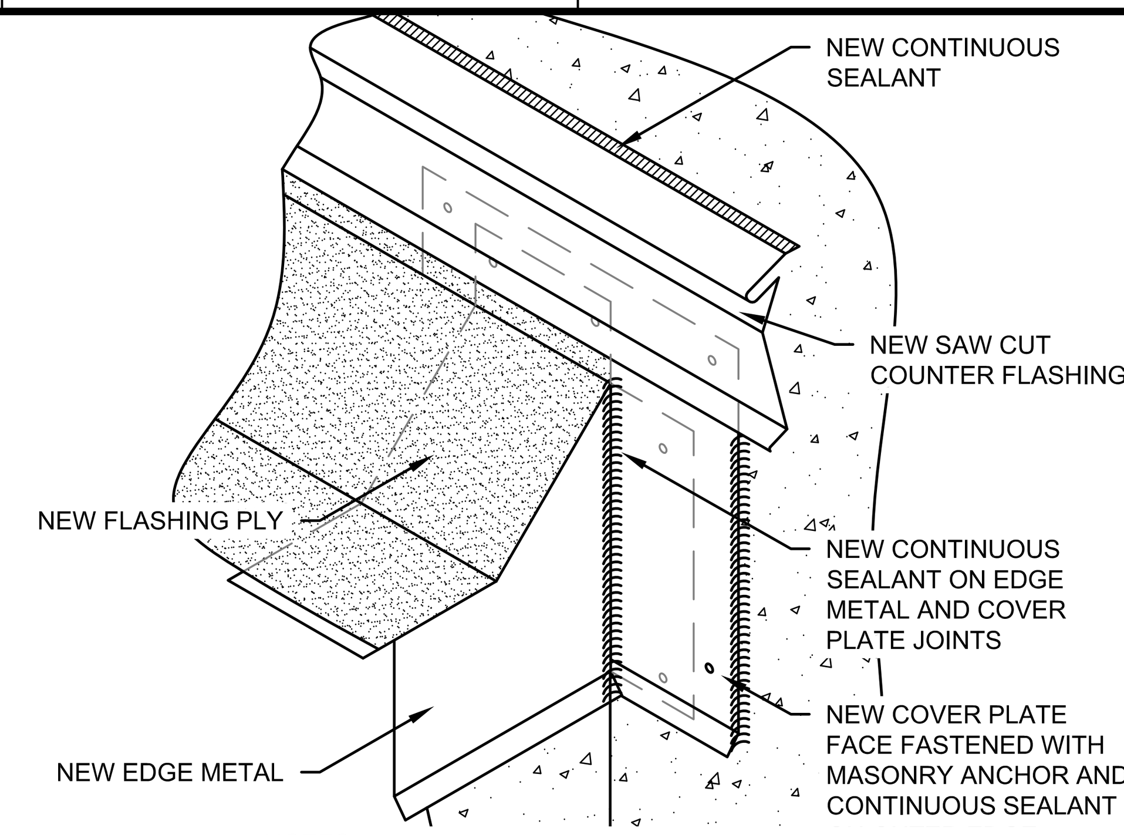
NATIONAL ROOFING PROGRAM (NPR)
FY019 PROJECT LA012
US ARMY RESERVE CENTER
1640 SURREY ST. LAFAYETTE, LOUISIANA 70508

INSULATION ATTACHMENT PLAN OMS

SHEET ID

A-108

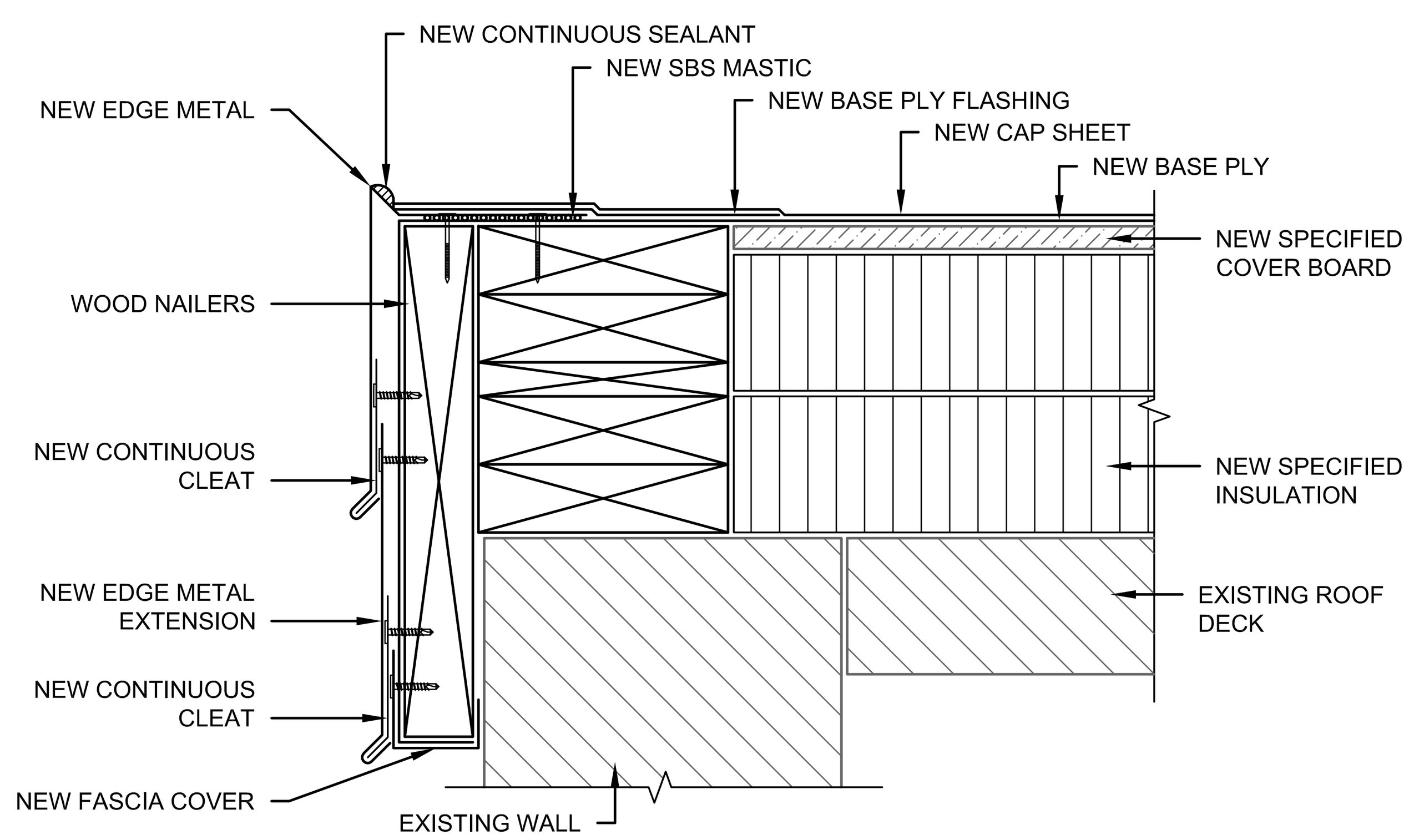
CERTIFIED FINAL



NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
2. GUTTER MAY NOT BE SHOWN FOR CLARITY.
3. FLASHING PLYS NOT SHOWN FOR CLARITY.

F3 ROOF EDGE TERMINATION

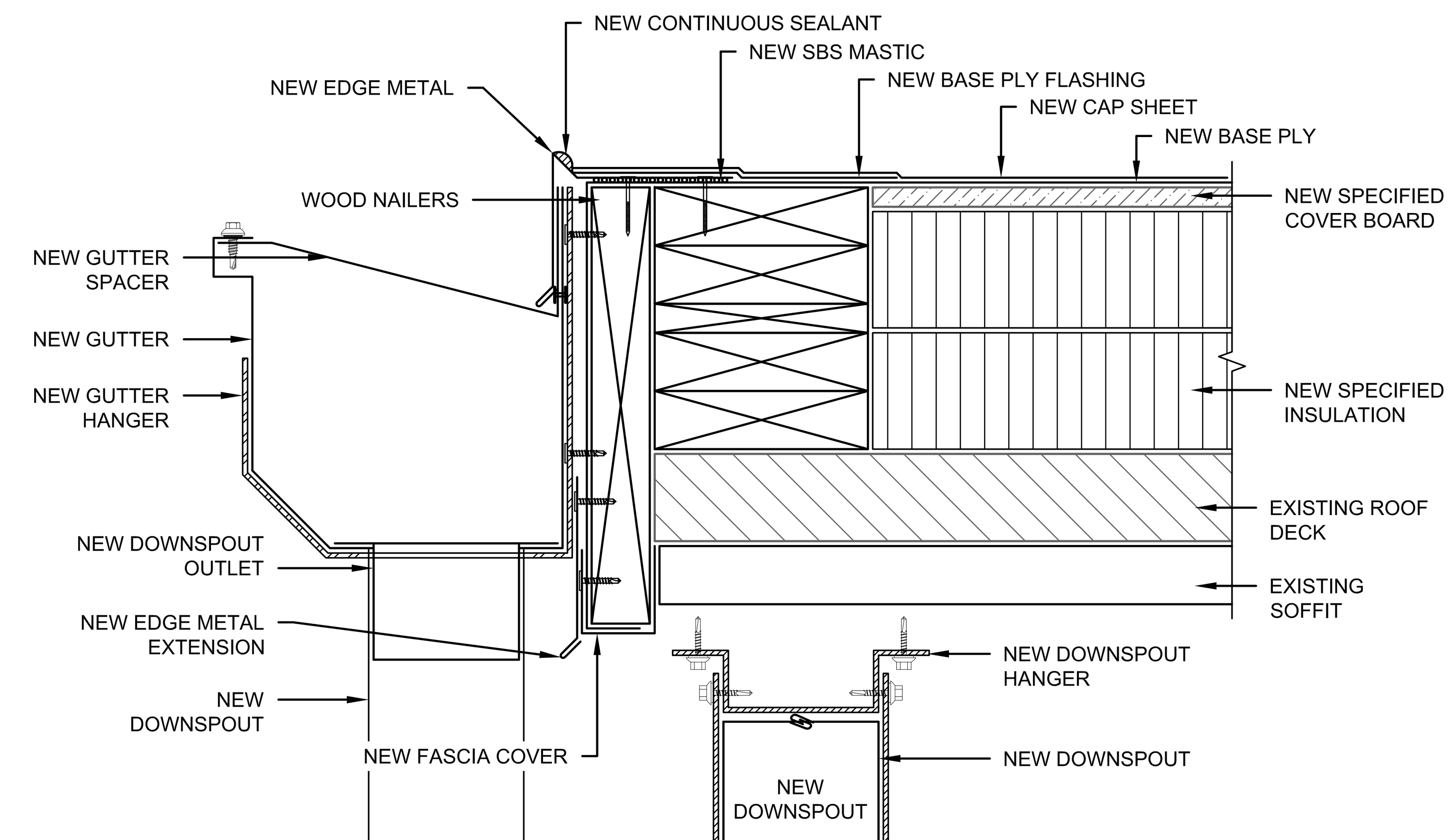
SCALE: NOT TO SCALE



NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
2. MODIFY/ ADD NEW WOOD NAILERS TO MATCH NEW INSULATION THICKNESS.
3. SLOPE IN EXISTING ROOF DECK MAY NOT BE SHOWN.

D1 ROOF EDGE

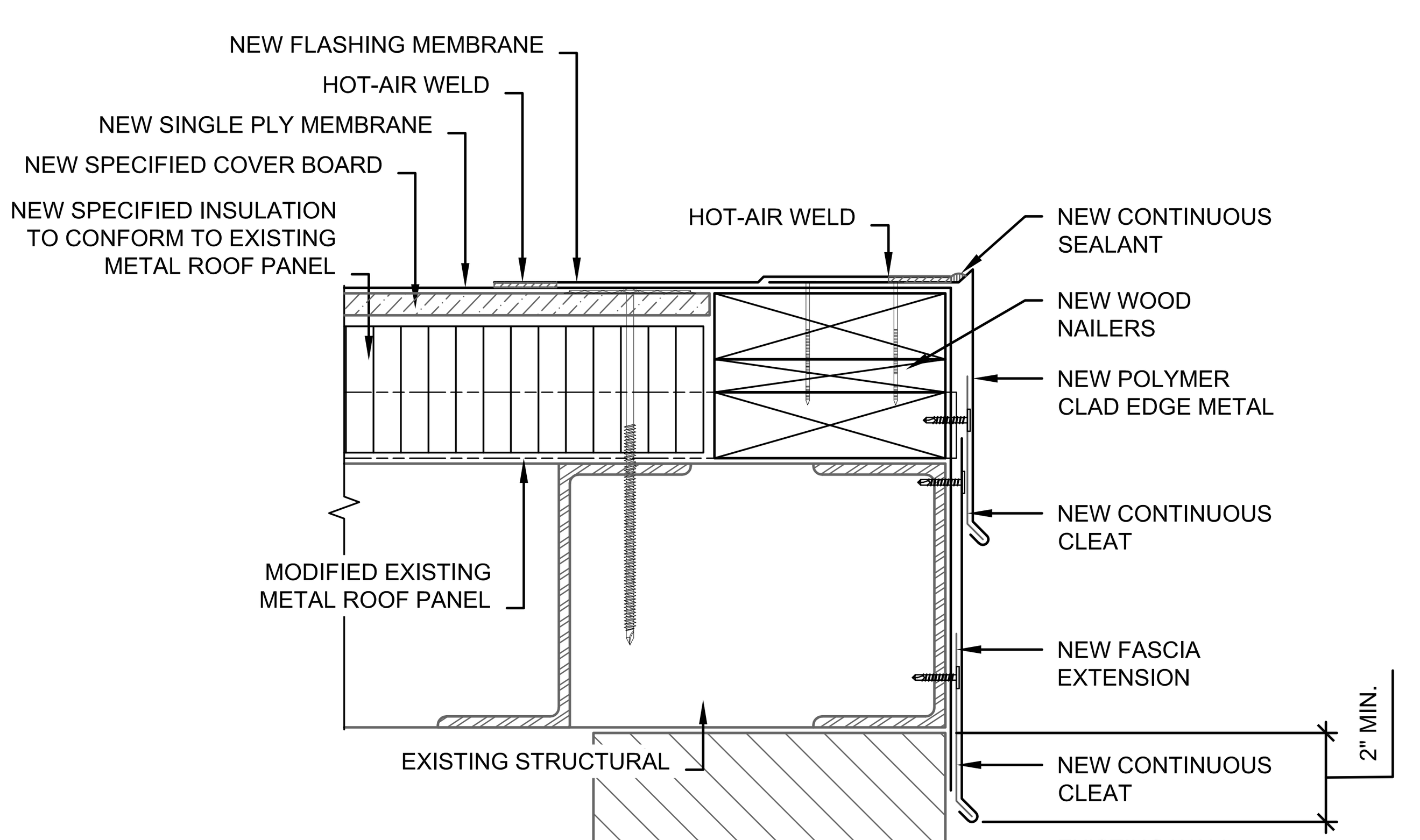
SCALE: 3" = 1' - 0"



NOTES:
1. NEW GUTTER TO BE 5" x 5".
2. NEW DOWNSPOUT TO BE 3" x 4" AND CONFORM TO THE EXISTING WALL PROFILE.
3. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
4. MODIFY/ ADD NEW WOOD NAILERS TO MATCH NEW INSULATION THICKNESS.
5. PROVIDE SPLASH BLOCKS AT DOWNSPOUT DISCHARGE ON GRADE AND SPLASH PANS AT DOWNSPOUT DISCHARGE ON ROOF (UNLESS OTHERWISE NOTED ON DRAWINGS).
6. SLOPE IN EXISTING ROOF DECK MAY NOT BE SHOWN.

D5 ROOF EDGE WITH GUTTER AND DOWNSPOUT

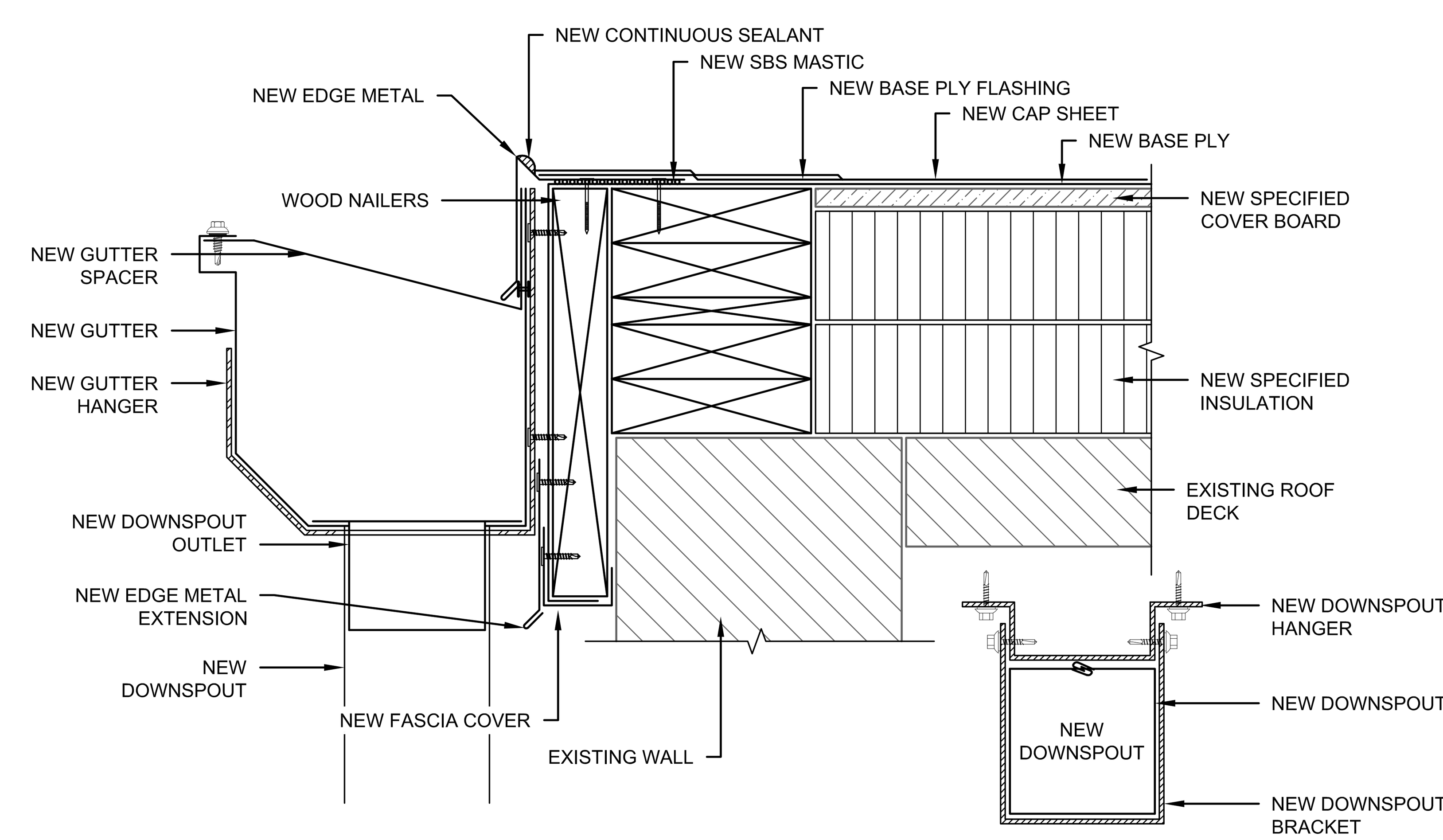
SCALE: 3" = 1' - 0"



NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
2. REMOVE EXISTING FASCIA AND REPLACE AS SHOWN.
3. REMOVE EXISTING HEAD CLOSURE ASSEMBLY.
4. MODIFY EXISTING METAL ROOF PANEL TO ACCOMMODATE NEW WOOD NAILERS..
5. MODIFY/ ADD NEW WOOD NAILERS TO MATCH NEW INSULATION THICKNESS.
6. MODIFIY EXISTING METAL WALL PANEL TO ACCOMMODATE NEW WOOD NAILERS AND FASCIA EXTENSION.
7. SLOPE NOT SHOWN FOR CLARITY.

A1 FLUTE-FILLED HEAD FLASHING

SCALE: 3" = 1' - 0"



NOTES:
1. NEW GUTTER TO BE 5" x 5".
2. NEW DOWNSPOUT TO BE 3" x 4" AND CONFORM TO THE EXISTING WALL PROFILE.
3. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
4. MODIFY/ ADD NEW WOOD NAILERS TO MATCH NEW INSULATION THICKNESS.
5. PROVIDE SPLASH BLOCKS AT DOWNSPOUT DISCHARGE ON GRADE AND SPLASH PANS AT DOWNSPOUT DISCHARGE ON ROOF (UNLESS OTHERWISE NOTED ON DRAWINGS).
6. SLOPE IN EXISTING ROOF DECK MAY NOT BE SHOWN.

A5 ROOF EDGE WITH GUTTER AND DOWNSPOUT

SCALE: 3" = 1' - 0"

GENERAL SHEET NOTES

1. DETAILS SHOWN ARE TYPICAL CONDITIONS, CONDITIONS MAY VARY BUT SHOULD BE ADDRESSED SIMILARLY.
2. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
3. REFER TO MANUFACTURER AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

SHEET KEY NOTES

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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DRAWN BY: A. DAVID
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SUBMITTED BY: K. PARKER
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U.S. ARMY CORPS OF ENGINEERS
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600 DR. MARTIN LUTHER KING PL
LOUISVILLE, KENTUCKY 40202

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CHARLESTON, SOUTH CAROLINA 29407
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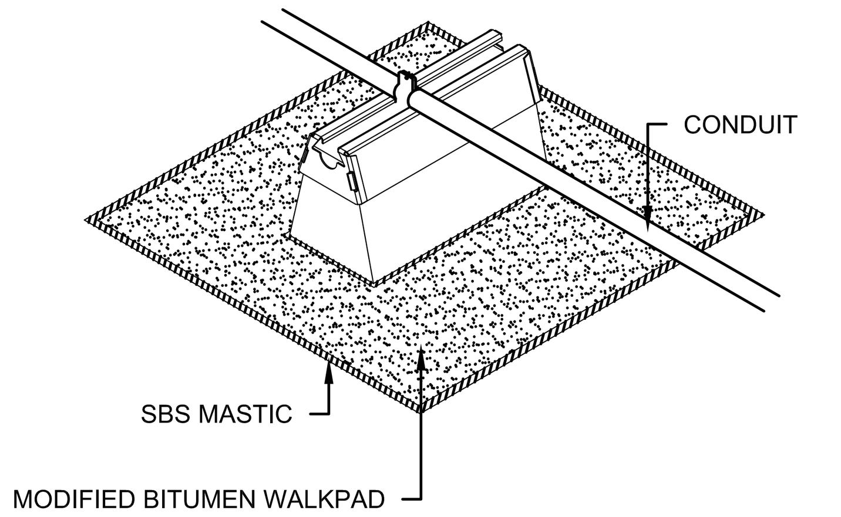
NATIONAL ROOFING PROGRAM (NPR)
FY019 PROJECT LA012
US ARMY RESERVE CENTER
1640 SURREY ST. LAFAYETTE, LOUISIANA 70508

ROOF DETAILS

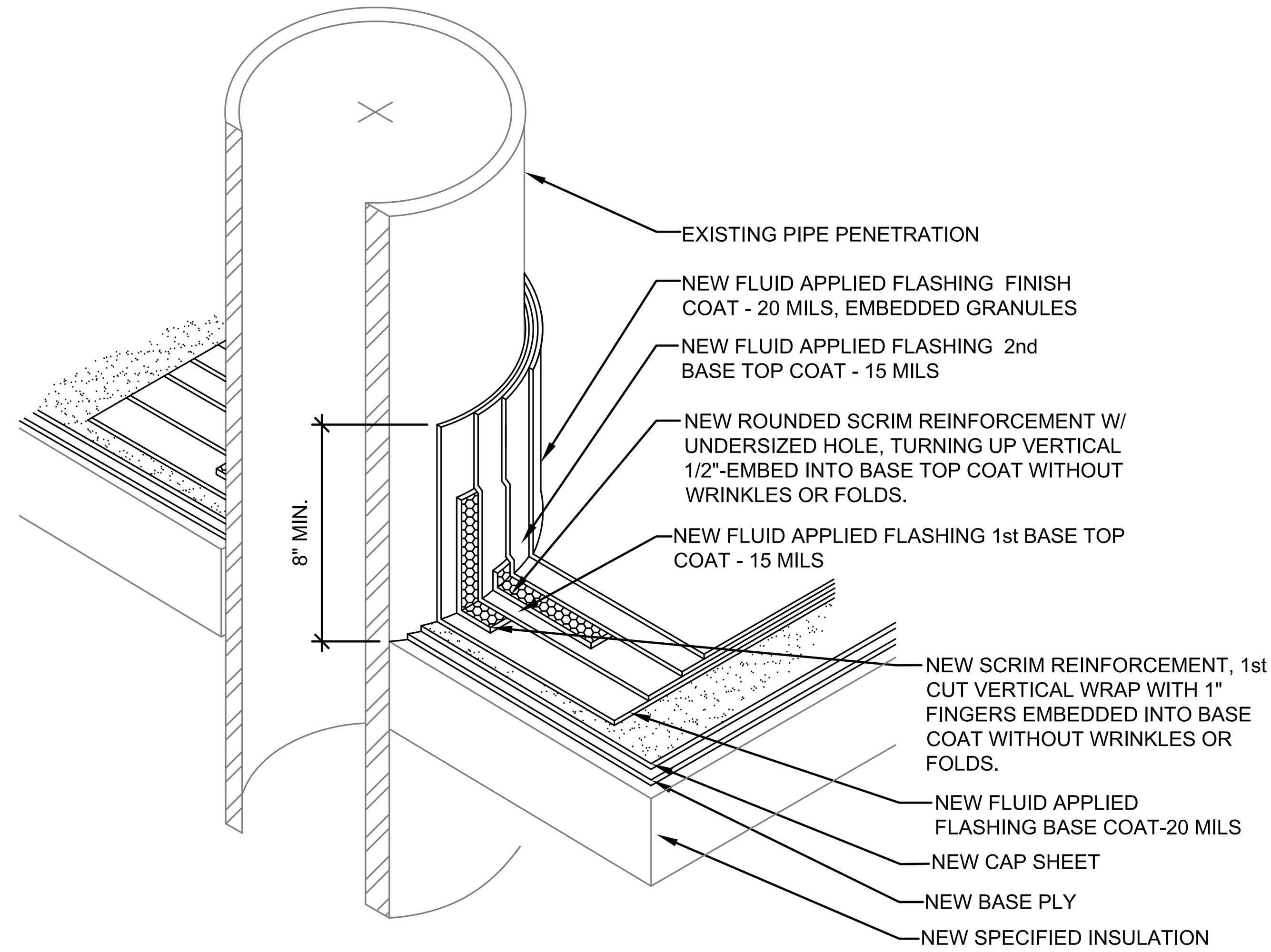
SHEET ID
A-501

CERTIFIED FINAL



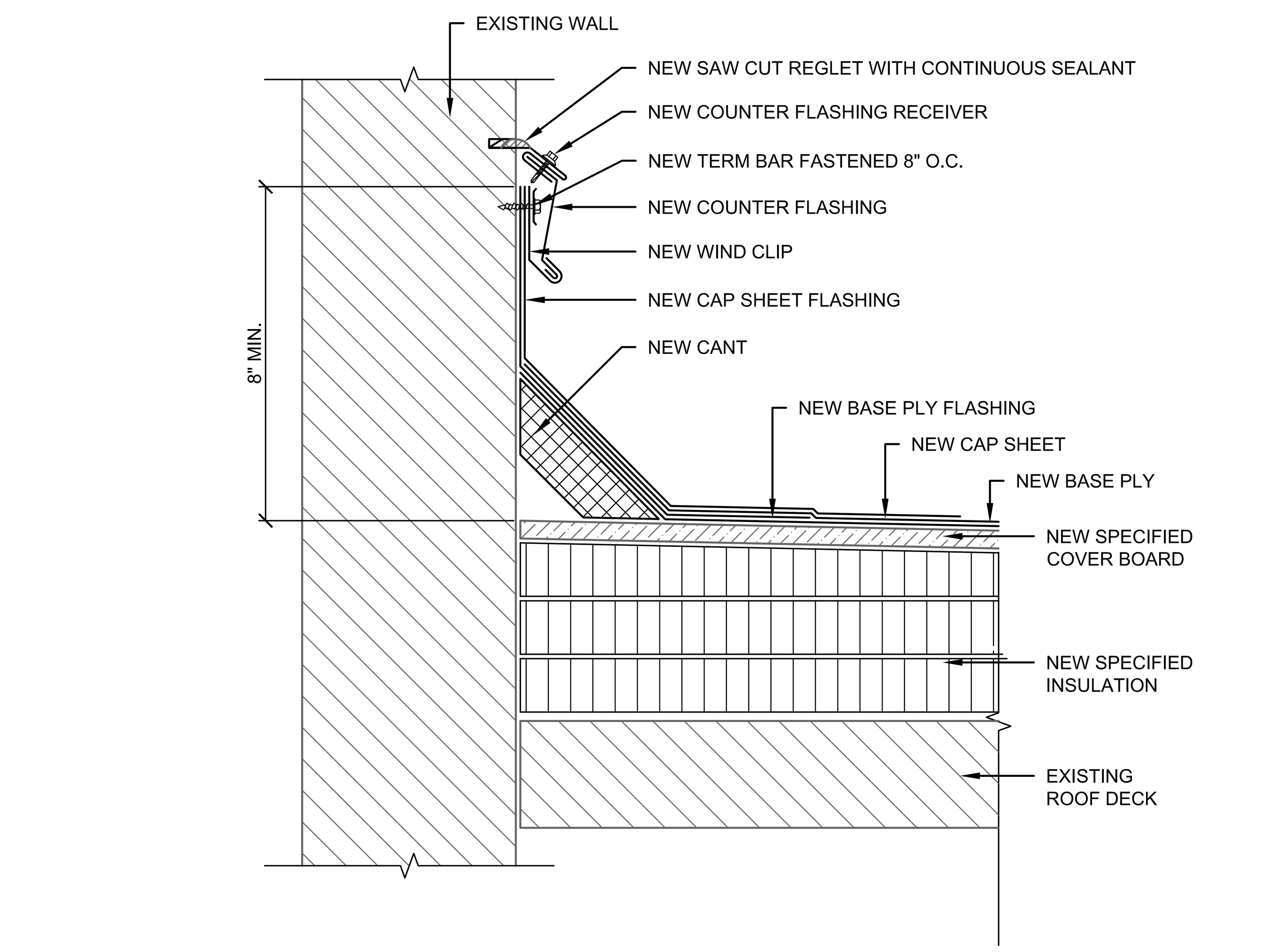
NOTES:
1. CONTRACTOR IS RESPONSIBLE FOR MOVING / RAISING OR LOWERING LINE TO REST ON THE NEW SUPPORTS.
2. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL MECHANICAL / ELECTRICAL WORK REQUIRED TO MODIFY EXISTING CONDUIT / GAS LINES OR RELATED EQUIPMENT.

E1 CONDUIT SUPPORT
SCALE: NOT TO SCALE



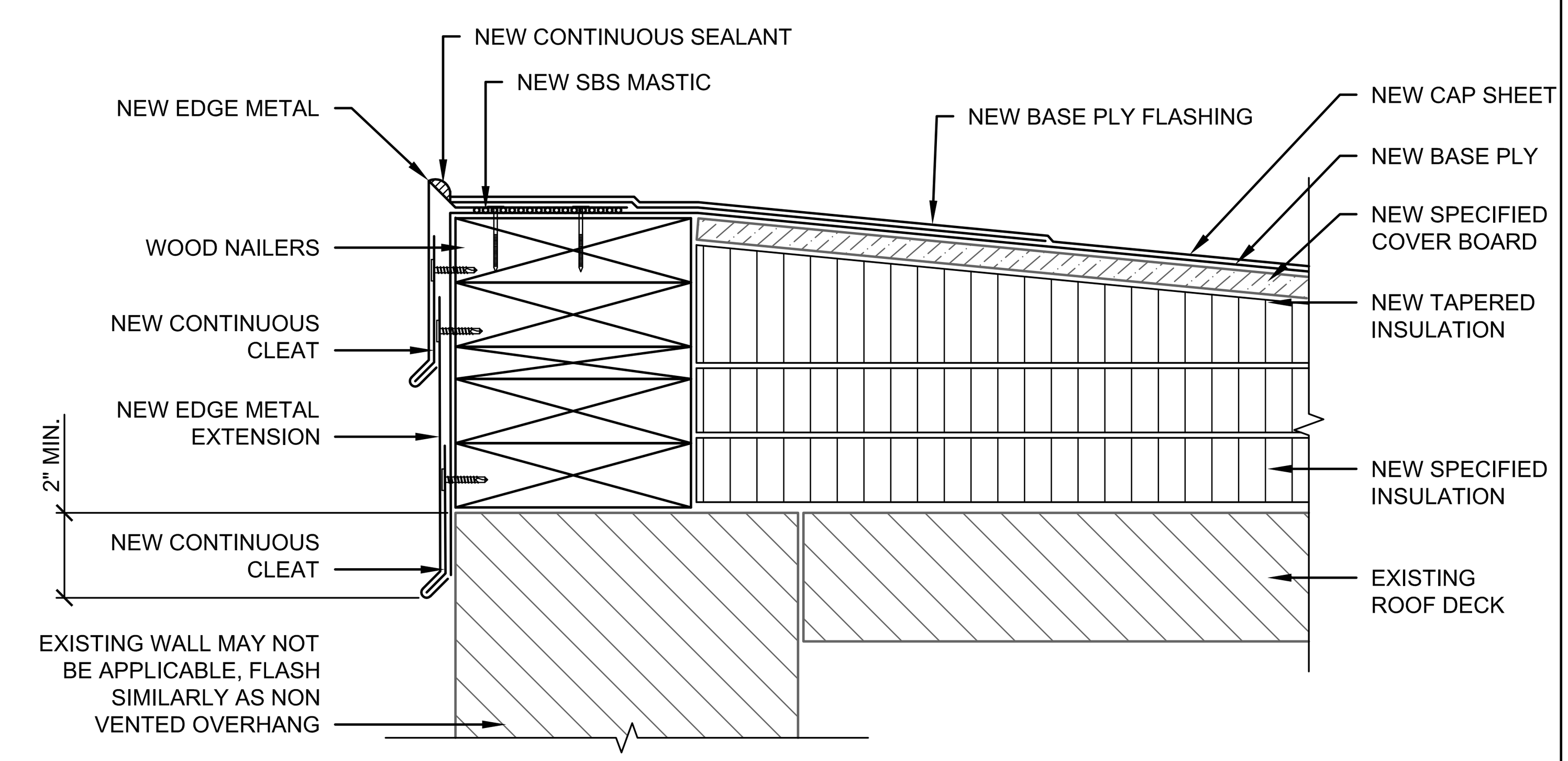
NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
2. PENETRATIONS ARE TO BE 8" MIN. FROM FINISHED INSULATION HEIGHT, RAISE IF NECESSARY.
3. DETAIL TO BE USED IN CONJUNCTION WITH MANUFACTURER'S GENERAL REQUIREMENTS, APPROVED DETAILS AND FLUID APPLIED FLASHING PRODUCT'S APPLICATION AND COVERAGE DIRECTIONS.
4. SLOPE IN EXISTING ROOF DECK MAY NOT BE SHOWN.
5. TAPERED INSULATION MAY NOT BE SHOWN FOR CLARITY.

E3 PIPE PENETRATION
SCALE: NOT TO SCALE



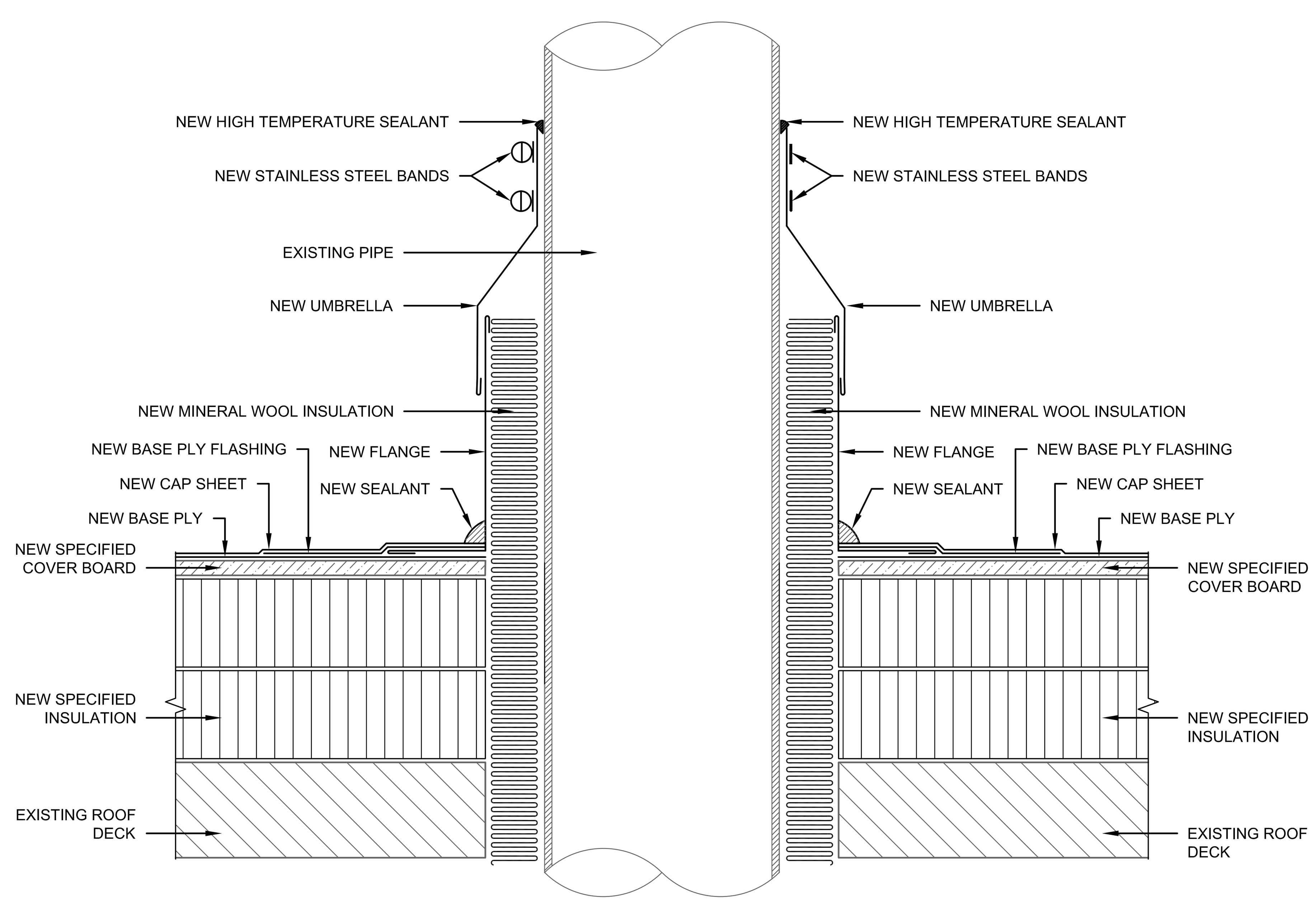
NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
2. CONTRACTOR TO CAREFULLY SAW CUT, CLEAN AND PREP NEW REGLET TO RECEIVE NEW COUNTER FLASHING RECEIVER.
3. NEW REGLET TO BE HORIZONTAL WITH 8" MIN. FLASHING HEIGHT AT GREATEST INSULATION THICKNESS.
4. SLOPE IN EXISTING ROOF DECK MAY NOT SHOWN.

E6 ROOF TO WALL
SCALE: 3" = 1' - 0"



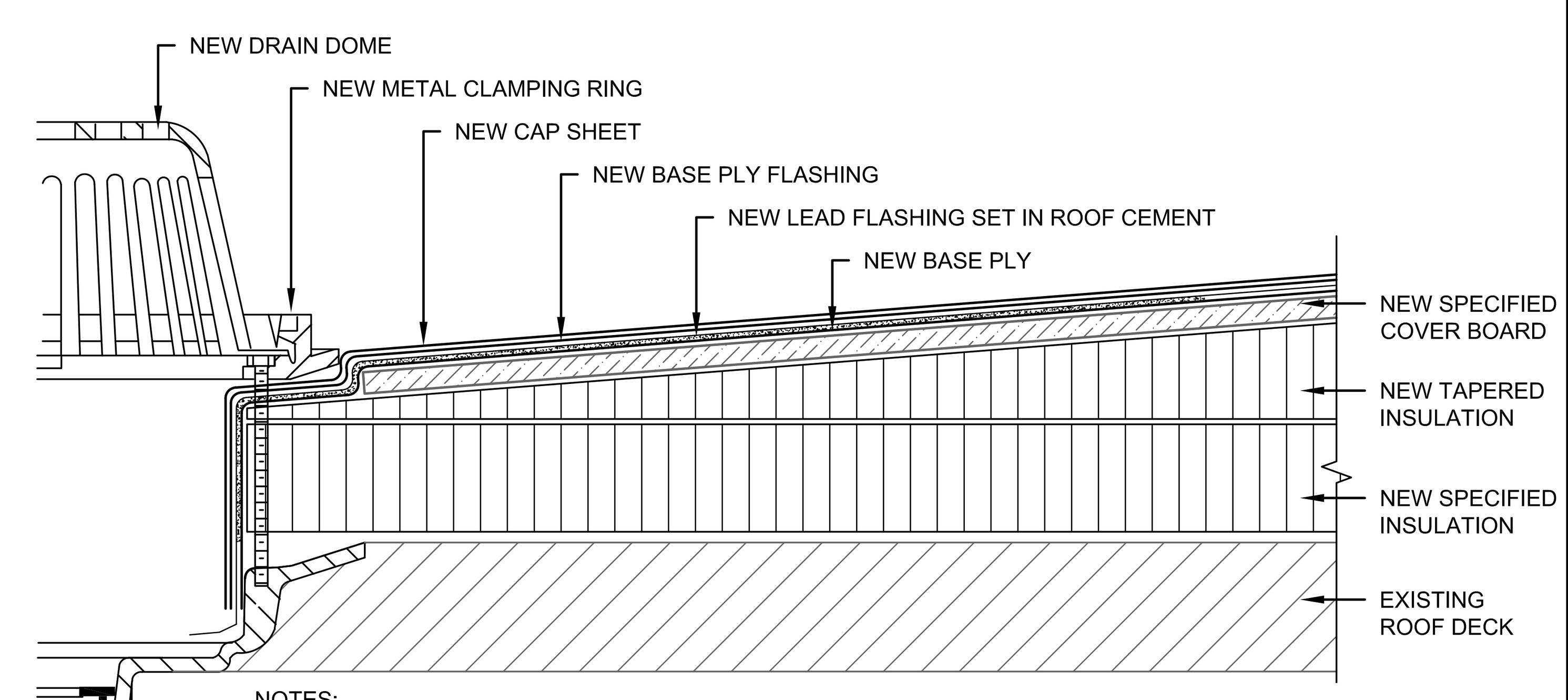
NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
2. PROVIDE NEW TAPERED INSULATION AT ROOF EDGE ACHIEVE SMOOTH TRANSITION.
3. SLOPE IN EXISTING ROOF DECK MAY NOT BE SHOWN.

C6 ROOF EDGE WITH TAPERED SLOPE TRANSITION
SCALE: 3" = 1' - 0"



NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. PIPE SIZES AND HEIGHTS MAY VARY, FLASH SIMILARLY.
2. SLOPE IN EXISTING ROOF DECK MAY NOT BE SHOWN.
3. TAPERED INSULATION MAY NOT BE SHOWN.

A1 HOT STACK
SCALE: NOT TO SCALE



NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
2. PROVIDE MINIMUM 4' x 4' SUMP AROUND DRAIN.
3. ADJUST DRAIN HEIGHT TO MATCH NEW INSULATION THICKNESS.

A6 ROOF DRAIN
SCALE: 3" = 1' - 0"

GENERAL SHEET NOTES

1. DETAILS SHOWN ARE TYPICAL CONDITIONS, CONDITIONS MAY VARY BUT SHOULD BE ADDRESSED SIMILARLY.
2. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
3. REFER TO MANUFACTURER AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

SHEET KEY NOTES

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: K. PARKER
DRAWN BY: A. DAVID
CHECKED BY: B. WIGGINS
SUBMITTED BY: K. PARKER
SIZE: ANSI D
ISSUE DATE: 17 JULY 2020
SOLICITATION NO.:
CONTRACT NO.:

U.S. ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING PL
LOUISVILLE, KENTUCKY 40202

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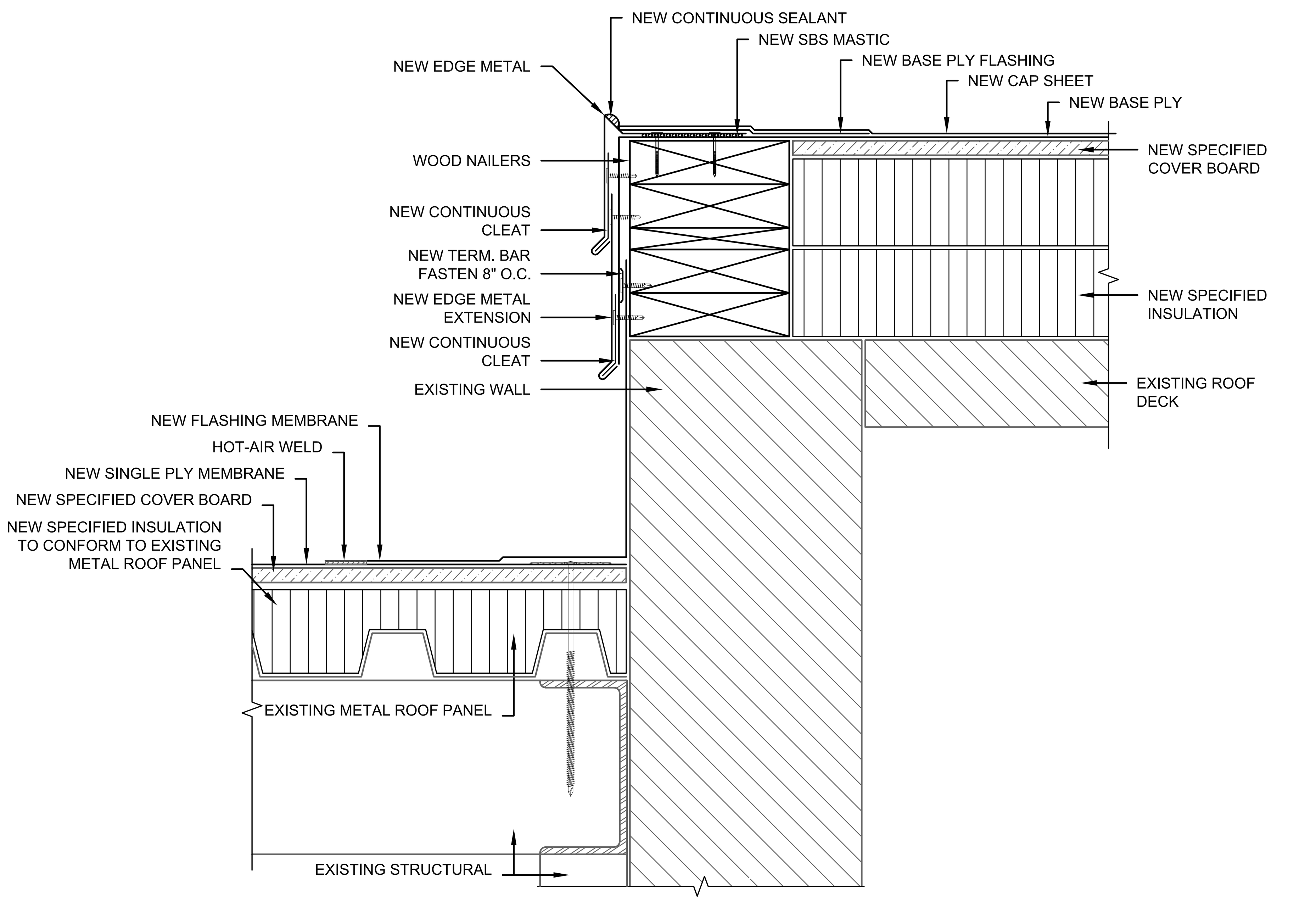
CHARLESTON, SOUTH CAROLINA 29407
www.reiengineers.com

NATIONAL ROOFING PROGRAM (NPR)
FY019 PROJECT LA012
US ARMY RESERVE CENTER
1640 SURREY ST. LAFAYETTE, LOUISIANA 70508

ROOF DETAILS

SHEET ID
A-502

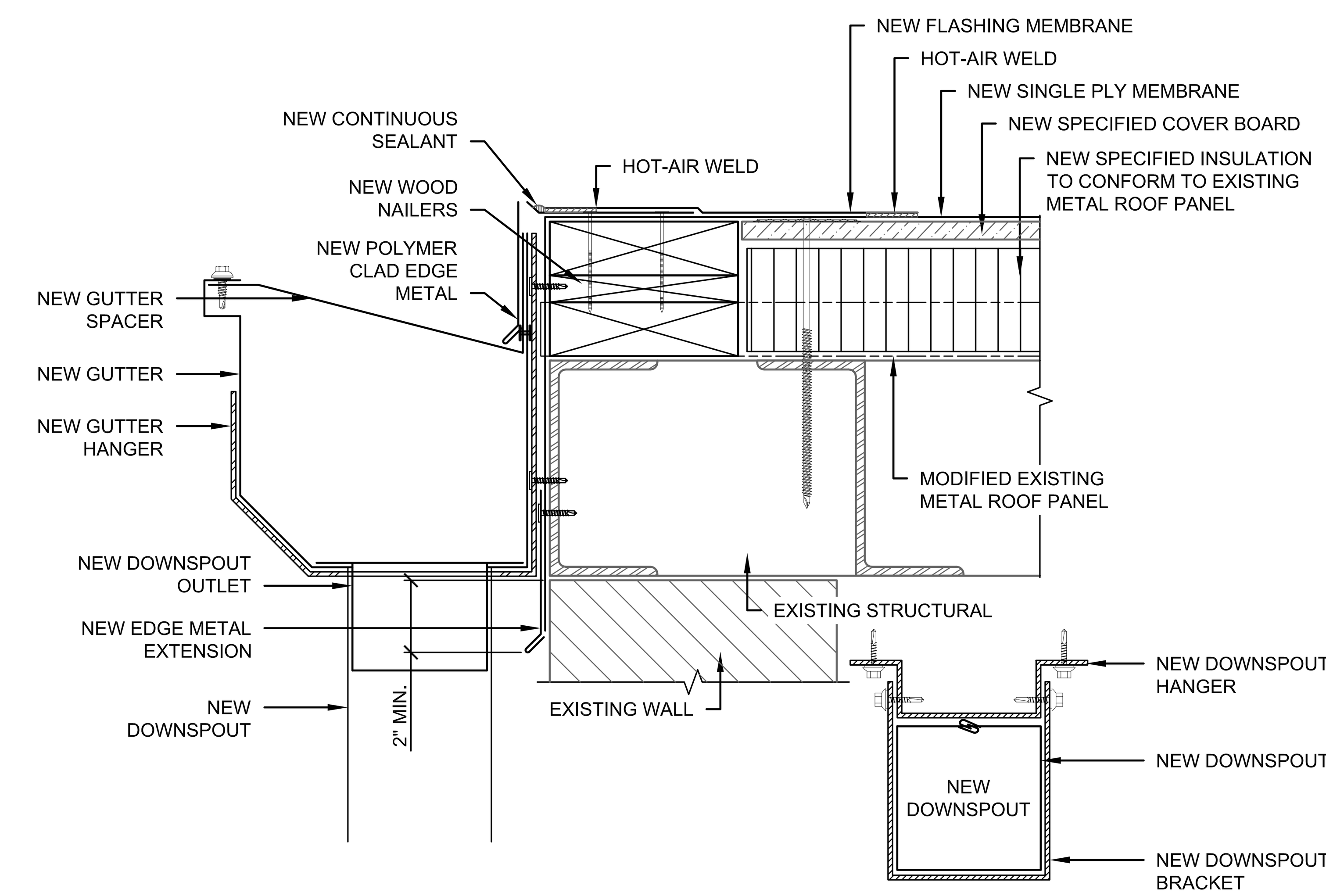
CERTIFIED FINAL



NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.

D1 FLUTE-FILL ROOF TO ROOF EDGE

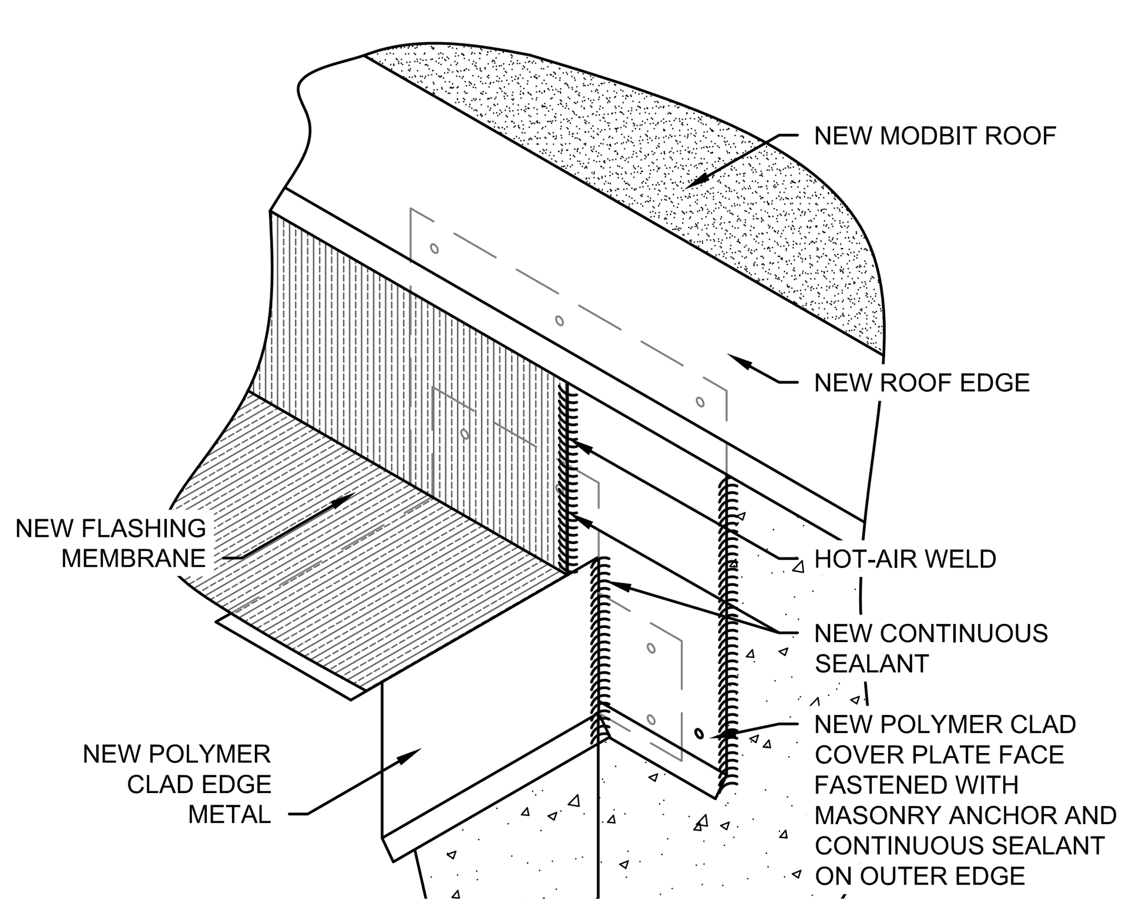
SCALE: 3" = 1' - 0"



NOTES:
1. NEW GUTTER TO BE 5" x 5".
2. NEW DOWNSPOUT TO BE 3" x 4" AND CONFORM TO THE EXISTING WALL PROFILE.
3. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
4. REMOVE EXISTING FASCIA AND REPLACE AS SHOWN.
5. MODIFY EXISTING METAL ROOF PANEL TO ACCOMMODATE NEW WOOD NAILERS.
6. MODIFY/ ADD NEW WOOD NAILERS TO MATCH NEW INSULATION THICKNESS.
7. MODIFIY EXISTING METAL WALL PANEL TO ACCOMMODATE NEW WOOD NAILERS AND FASCIA EXTENSION.
8. SLOPE NOT SHOWN FOR CLARITY.

D5 FLUTE-FILL ROOF EDGE WITH GUTTER AND DOWNSPOUT

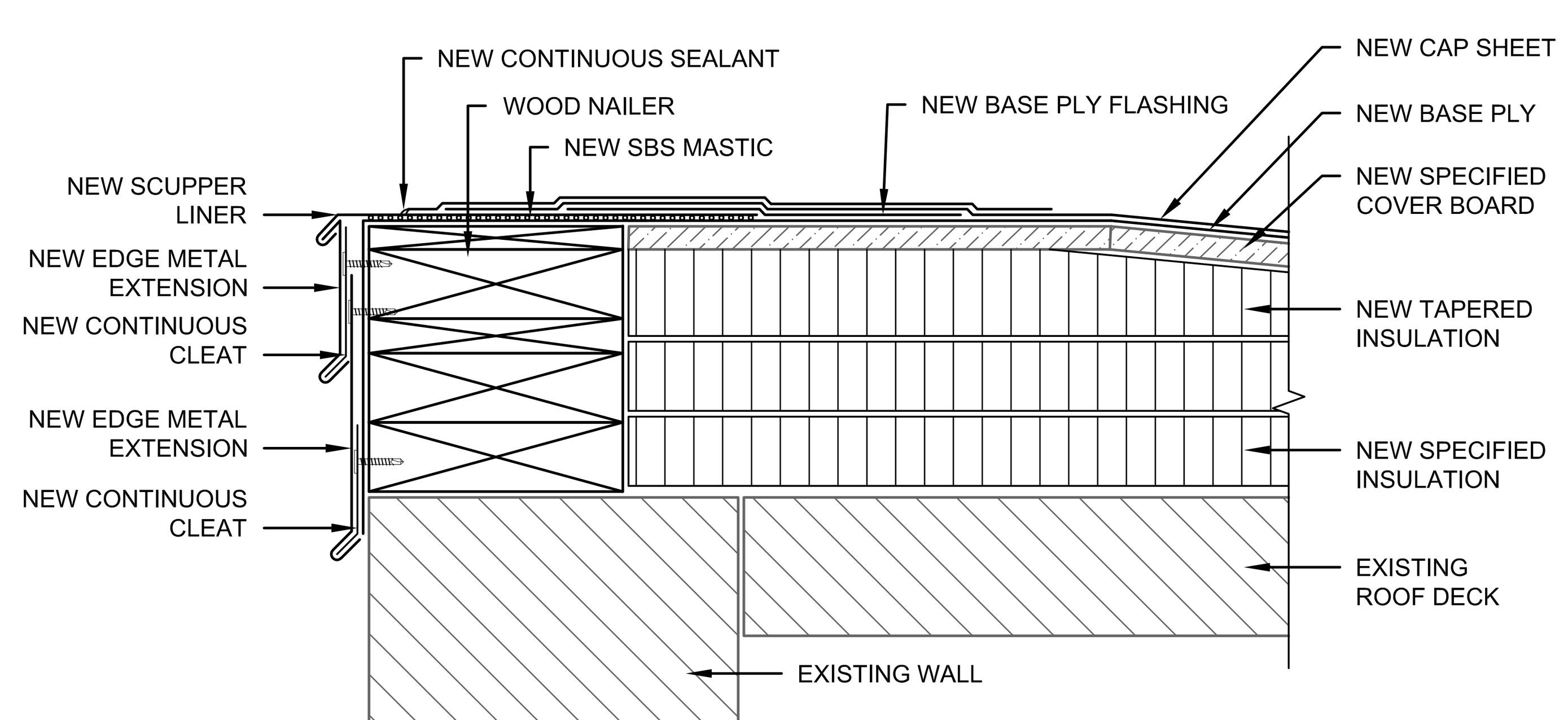
SCALE: 3" = 1' - 0"



NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
2. GUTTER MAY NOT BE SHOWN FOR CLARITY.

A1 ROOF EDGE TERMINATION

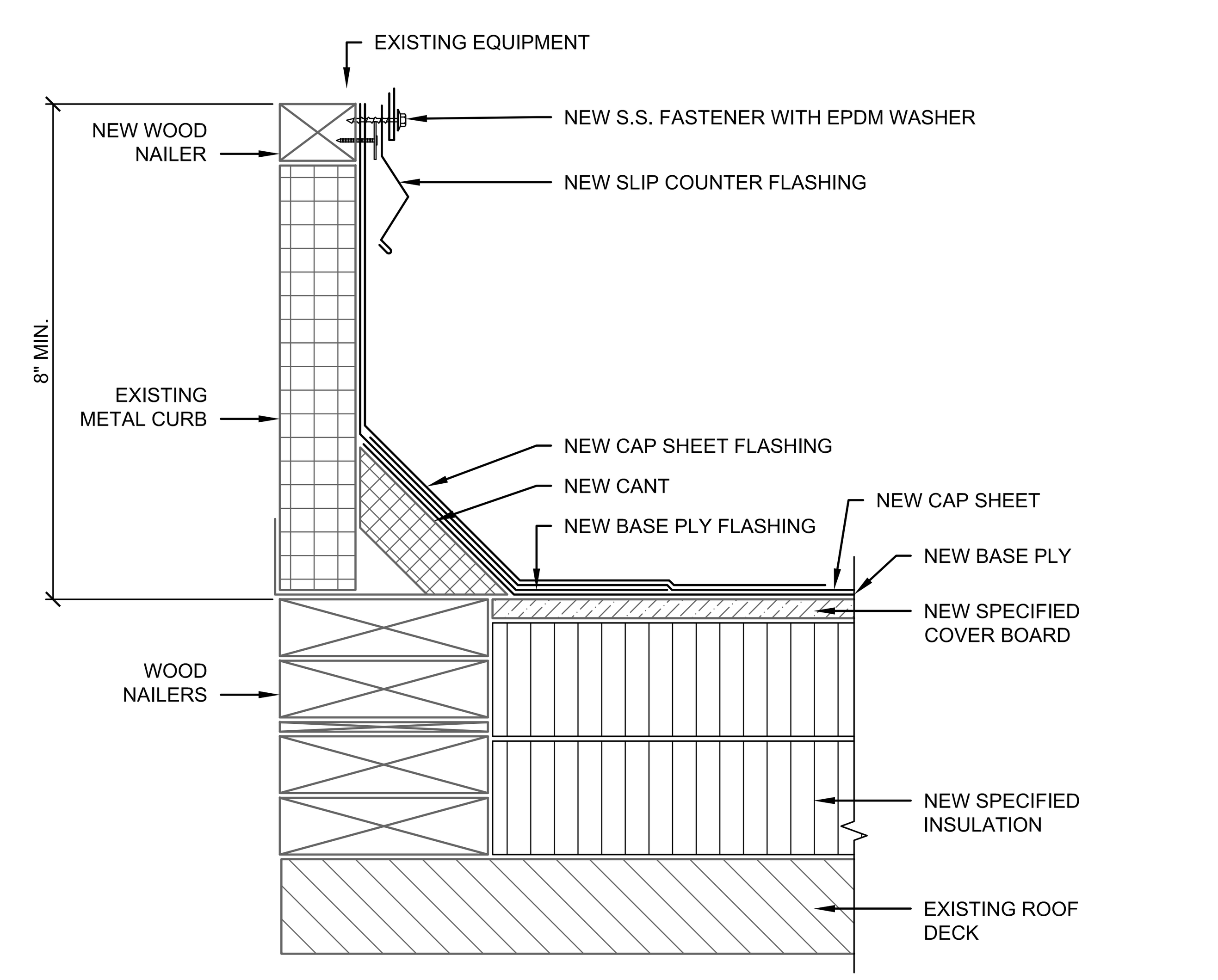
SCALE: NOT TO SCALE



NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
2. SLOPE IN EXISTING ROOF DECK MAY NOT BE SHOWN.

A3 OVERFLOW EDGE SCUPPER

SCALE: 3" = 1' - 0"



NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
2. MODIFY/ ADD NEW WOOD NAILERS TO ACHIEVE 8" MIN. BASE FLASHING HEIGHT.
3. SLOPE IN EXISTING ROOF DECK MAY NOT BE SHOWN.
4. TAPERED INSULATION INSULATION MAY NOT BE SHOWN FOR CLARITY.

A6 EQUIPMENT CURB - METAL

SCALE: 3" = 1' - 0"

GENERAL SHEET NOTES

1. DETAILS SHOWN ARE TYPICAL CONDITIONS, CONDITIONS MAY VARY BUT SHOULD BE ADDRESSED SIMILARLY.
2. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
3. REFER TO MANUFACTURER AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

SHEET KEY NOTES

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: 17 JULY 2020
SOLICITATION NO.:
CONTRACT NO.:

DESIGNED BY: K. PARKER
DRAWN BY: A. DAVID
CHECKED BY: B. WIGGINS
SUBMITTED BY: K. PARKER
SIZE: ANSI D

U.S. ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING PL
LOUISVILLE, KENTUCKY 40202

REI ENGINEERS
ROOFING, WATERPROOFING & BUILDING ENVELOPE ENGINEERS & CONSULTANTS
2090 EXECUTIVE HALL ROAD, SUITE 115
CHARLESTON, SOUTH CAROLINA 29407
www.reiengineers.com

NATIONAL ROOFING PROGRAM (NPR)
FY019 PROJECT LA012
US ARMY RESERVE CENTER
1640 SURREY ST. LAFAYETTE, LOUISIANA 70508

ROOF DETAILS

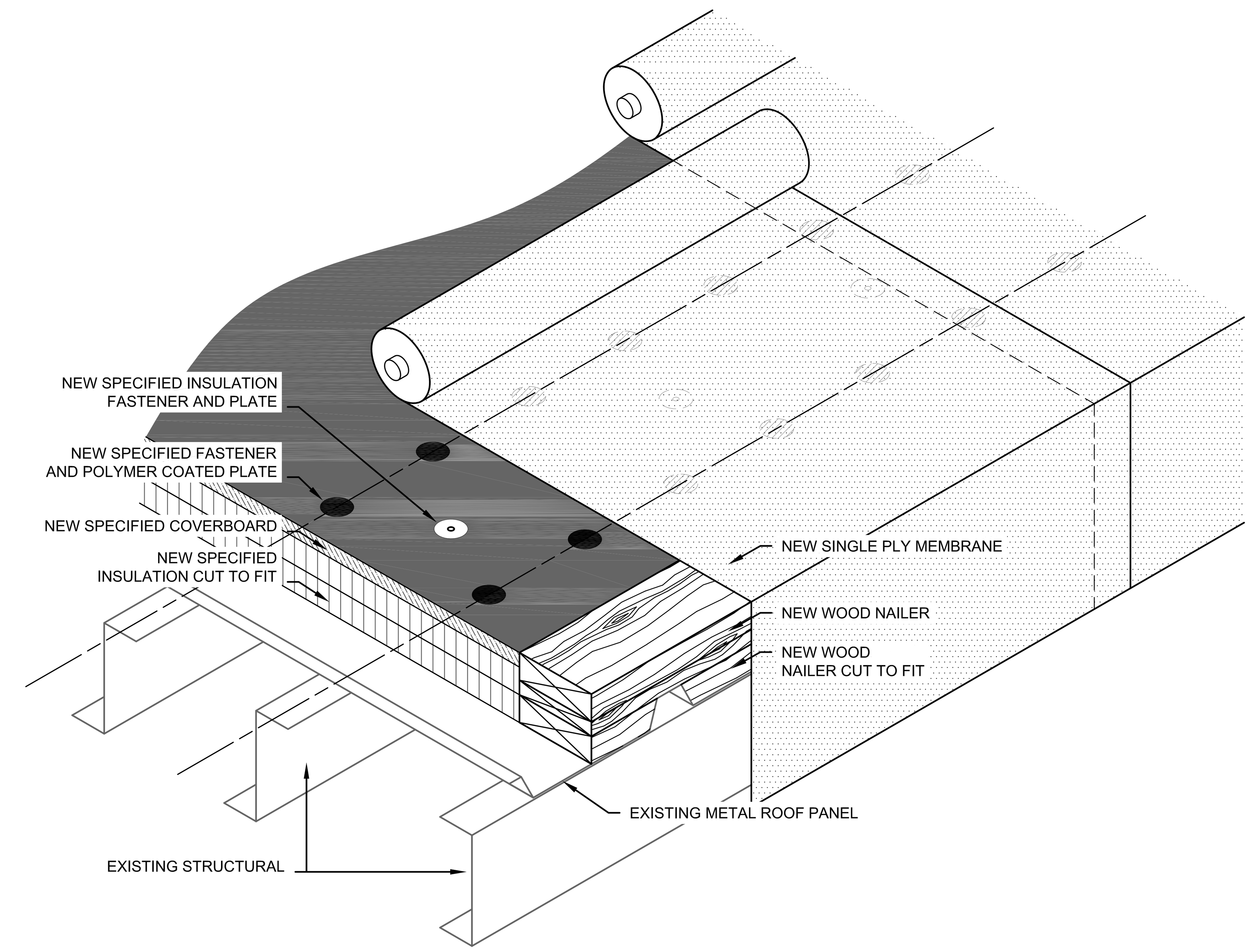
SHEET ID

A-503

CERTIFIED FINAL

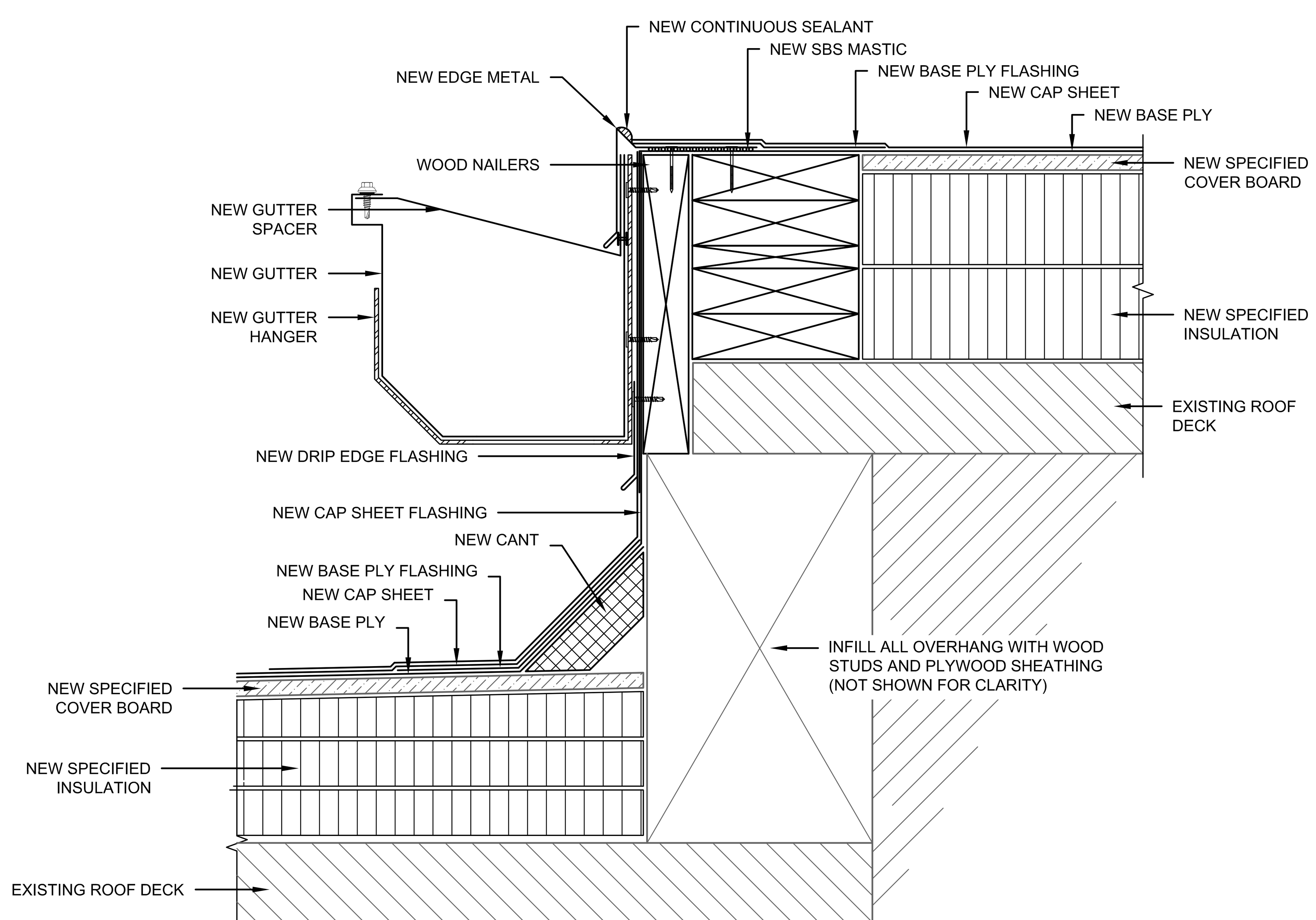
1 2 3 4 5 6 7 8 9 10

G F E D C B A



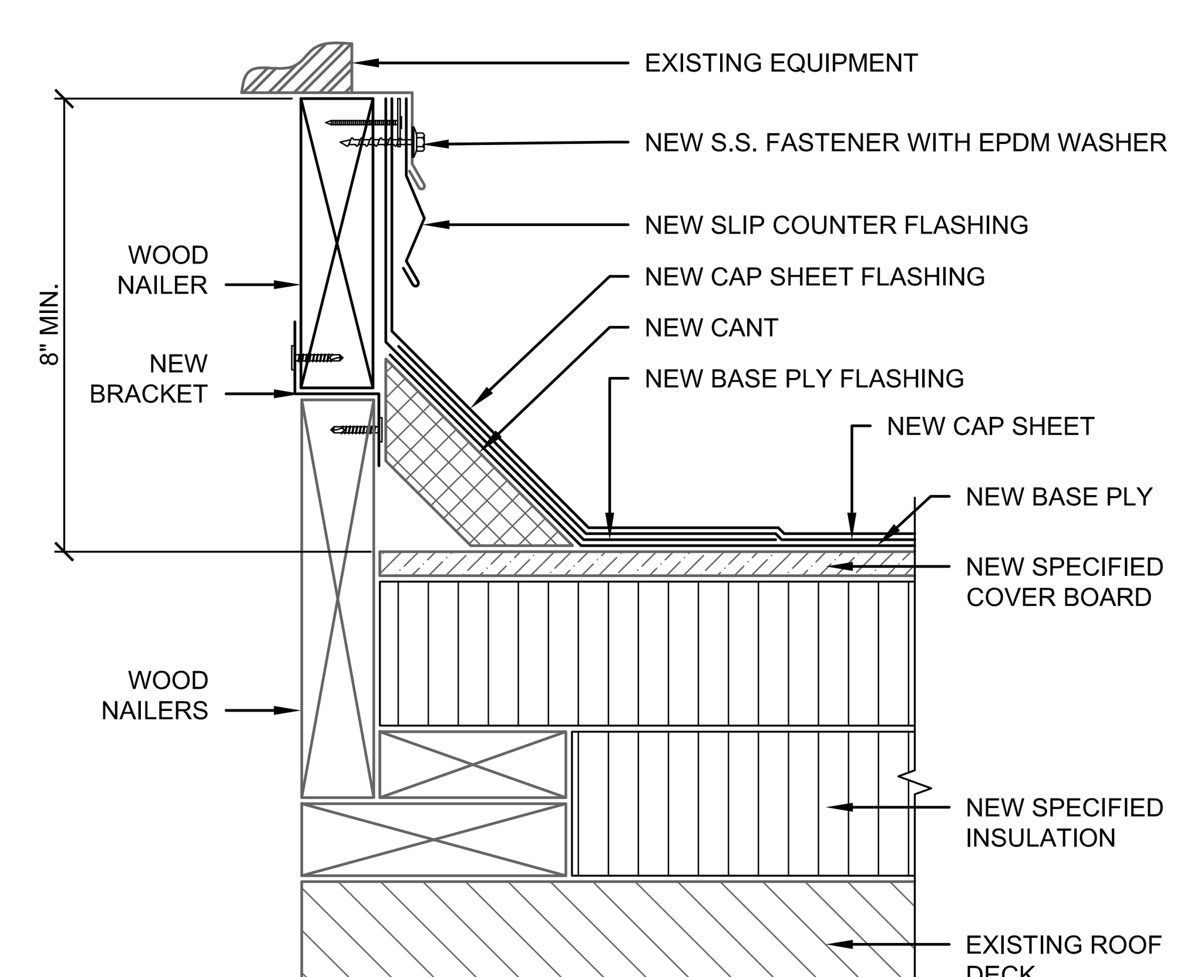
NOTES:
1. CONDITIONS MAY VARY, FLASH SIMILARLY.
2. PROPERLY CUT TO FIT BOTTOM LAYER OF NAILERS AND INSULATION TO MATCH EXISTING METAL ROOF PANEL PROFILE.
3. NEW SPECIFIED FASTENERS WITH POLYMER COATED PLATE TO ALIGN WITH EXISTING PURLINS (CENTER LINE EXAGGERATED FOR CLARITY).
4. EDGE COMPONENTS NOT SHOWN FOR CLARITY.
5. SLOPE NOT SHOWN FOR CLARITY.

D5 FLUTE-FILL ASSEMBLY
SCALE: NOT TO SCALE



NOTES:
1. BOX-IN SOFFIT IN THIS AREA ONLY.
2. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
3. MODIFY/ ADD NEW WOOD NAILERS TO MATCH NEW INSULATION THICKNESS.
4. SLOPE IN EXISTING ROOF DECK MAY NOT BE SHOWN.

A1 ROOF TO ROOF TRANSITION
SCALE: 3" = 1' - 0"



NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
2. MODIFY/ ADD NEW WOOD NAILERS TO ACHIEVE 8" MIN. BASE FLASHING HEIGHT.
3. SLOPE IN EXISTING ROOF DECK MAY NOT BE SHOWN.
4. TAPERED INSULATION INSULATION MAY NOT BE SHOWN FOR CLARITY.

A5 EQUIPMENT CURB - WOOD
SCALE: 3" = 1' - 0"

GENERAL SHEET NOTES

1. DETAILS SHOWN ARE TYPICAL CONDITIONS, CONDITIONS MAY VARY BUT SHOULD BE ADDRESSED SIMILARLY.
2. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
3. REFER TO MANUFACTURER AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

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LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING PL
LOUISVILLE, KENTUCKY 40202

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US ARMY RESERVE CENTER
1640 SURREY ST. LAFAYETTE, LOUISIANA 70508

ROOF DETAILS

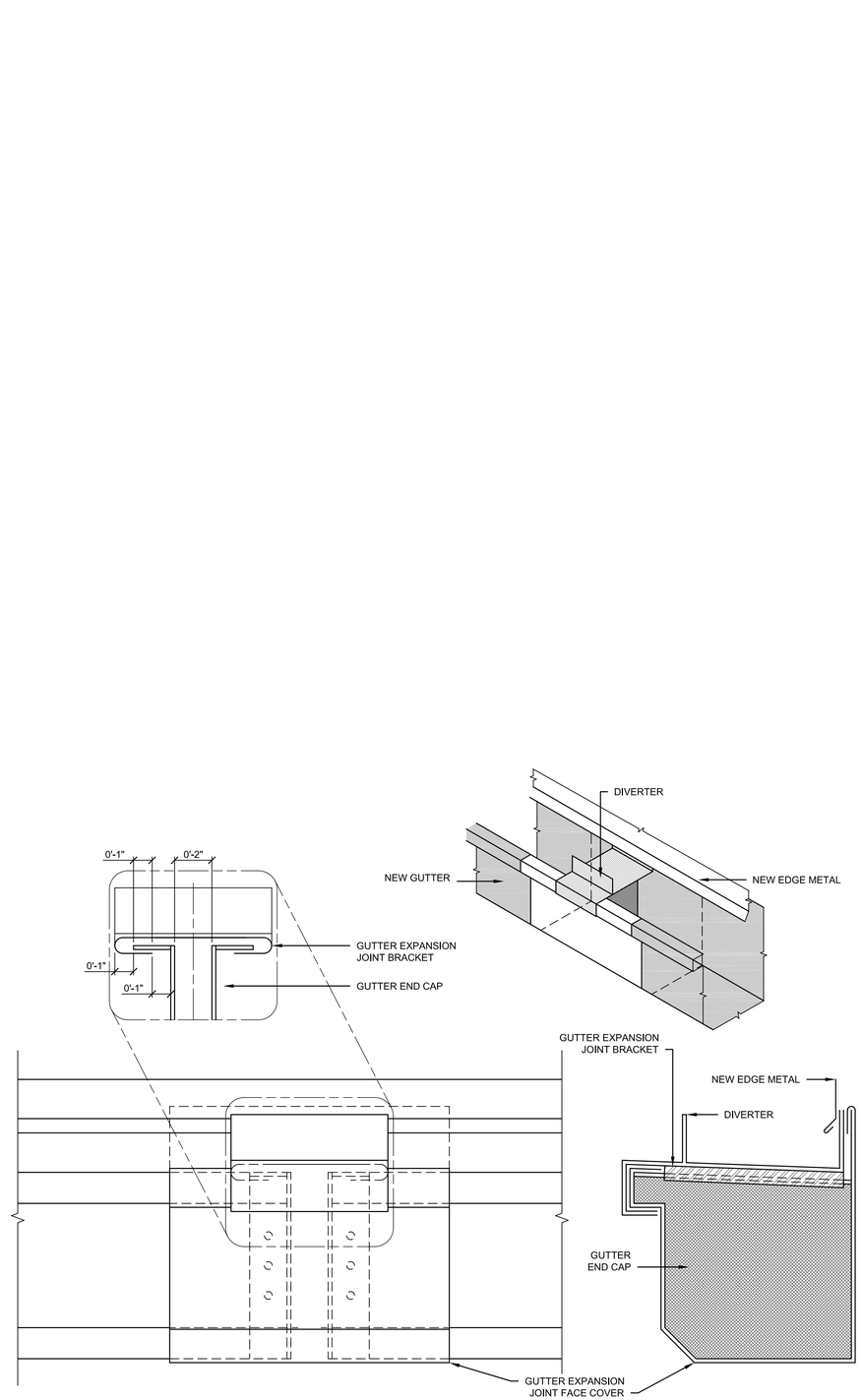
SHEET ID
A-504

CERTIFIED FINAL

GENERAL SHEET NOTES

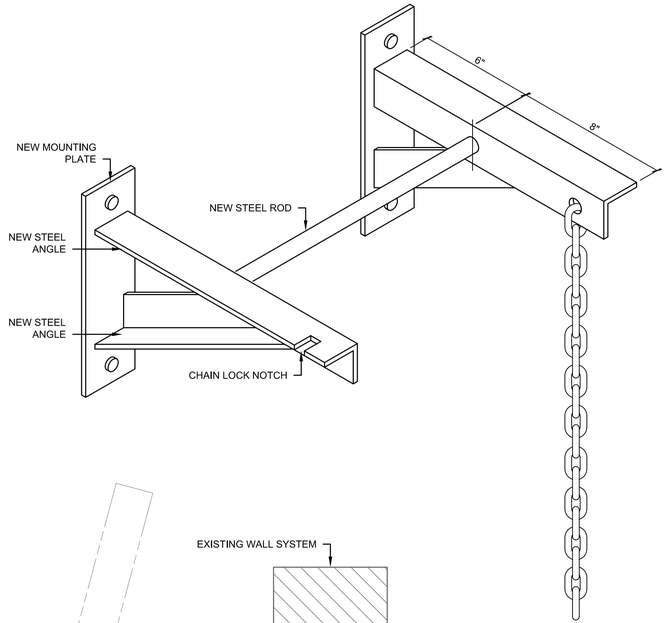
1. DETAILS SHOWN ARE TYPICAL CONDITIONS, CONDITIONS MAY VARY BUT SHOULD BE ADDRESSED SIMILARLY.
2. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
3. REFER TO MANUFACTURER AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

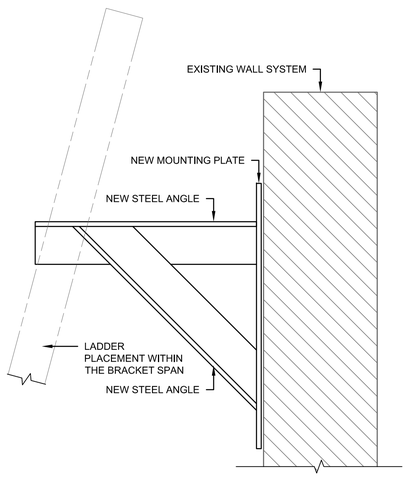
(#) SHEET KEY NOTES



NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.

A1 GUTTER EXPANSION JOINT
SCALE: NOT TO SCALE





NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS. CONDITIONS AND HEIGHTS MAY VARY, FLASH SIMILARLY.
2. WALL SYSTEM NOT SHOWN FOR CLARITY, CONTRACTOR TO VERIFY APPROVED MOUNTING FASTENERS.
3. CONTINUOUSLY WELD ALL STEEL ANGLE CONNECTION JOINTS.
4. PAINT NEW BRACKET ASSEMBLY TO SUIT THE CONTRACTING OFFICER.
5. EXACT LOCATION OF LADDER BRACKET TO BE IDENTIFIED BY CONTRACTING OFFICER.

A6 LADDER BRACKET
SCALE: NOT TO SCALE

US Army Corps of Engineers®

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2906 CELANESE ROAD, ROCK HILL, SC 29732
CHARLESTON, SOUTH CAROLINA 29407
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ROOF DETAILS

SHEET ID
A-505

CERTIFIED FINAL